

12 Appendices

12.1 Lease Agreement # 4116

**BOARD OF TRUSTEES OF THE INTERNAL
IMPROVEMENT TRUST FUND OF THE
STATE OF FLORIDA**
**ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT**
and
FLORIDA GAME AND FRESH WATER FISH COMMISSION
TRIPLE N RANCH
INTERGOVERNMENTAL LEASE AGREEMENT

Agreement No. 4116

This Agreement is made and entered into this 9th day of July, 1997,
between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND
OF THE STATE OF FLORIDA (as to its undivided 50% interest) and the Governing Board of
the ST. JOHNS RIVER WATER MANAGEMENT DISTRICT (as to its undivided 50%
interest), hereinafter collectively referred to as "LESSORS," and the FLORIDA GAME AND
FRESH WATER FISH COMMISSION, hereinafter referred to as "LESSEE".

W I T N E S S E T H :

For and in consideration of the mutual covenants and Agreements hereinafter contained,
LESSORS grant management authority for the below described premises to LESSEE subject to
the following terms and conditions:

1. DESCRIPTION OF MANAGEMENT LANDS: The management lands subject to this
Agreement, said lands within the Osceola Pine Savannahs CARL Project, is situated in the County
of Osceola, State of Florida, and known as Triple N Ranch, being more particularly described in
Exhibit "A" attached hereto and by reference made a part hereof, and hereinafter called the
"management lands."

2. TERM: The initial term of this Agreement shall be for a period of ten (10) years
commencing on July 9, 1997 and ending on July 8, 2007, unless sooner
terminated pursuant to the provisions of this Agreement. This Agreement is automatically
renewed for two twenty (20) year periods on each ending date unless sooner terminated as
otherwise set forth herein.

3. PURPOSE: LESSEE shall manage the management lands 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 and Section 373.59, Florida Statutes, as amended, along with other
authorized uses necessary for the accomplishment of this purpose as designated in the
Management Plan required by paragraph 7 of this Agreement.

4. QUIET ENJOYMENT AND RIGHT USE: LESSEE shall have the right of ingress and
egress to, from and upon the management lands for all purposes necessary to the full quiet
enjoyment by said LESSEE of the rights conveyed herein.

5. AUTHORIZED USES: Authorized uses for the purposes of this Agreement shall be defined as those management activities that the LESSEE is authorized to perform under the Agreement and the approved Management Plan. The authorized uses shall be consistent with statutory requirements that require that the management lands be managed and maintained in an environmentally acceptable manner to restore and protect its natural state and condition, including permitting of compatible recreational use. The authorized uses shall be subject to the minimum conditions and guidelines outlined below, which conditions and guidelines shall be incorporated into the Management Plan prepared according to paragraph 7 herein.

A. The management lands will be managed as a Type I Wildlife Management Area as that term is defined by the LESSEE.

B. The function and condition of the management lands with respect to water management, water supply and the conservation and protection of water resources will be enhanced or maintained in its present condition. In particular, watershed disturbances (e.g., clearcutting other than for restoration, new road construction, firebreaks, etc.) will be avoided, and adequate management of stormwater on existing roads and creek crossings will be conducted based on Best Management Practices as well as recommendations and assistance provided by the LESSORS.

C. The development of facilities within the wetlands identified on the management lands shall be restricted to trails, boardwalks, or other alterations which facilitate access for recreational and/or environmental education purposes and will be designed and built with a goal of minimizing disturbance to the natural communities.

D. The St. Johns River Water Management District may engage in construction or other activities necessary for water management purposes on the management lands provided that such construction or activities are consistent with the approved Management Plan. The St. Johns River Water Management District will provide reasonable notice to the LESSEE of any such activities prior to their commencement.

E. Interim activities that are undertaken prior to the review and approval of the Management Plan shall be evaluated in accordance with guidance provided in the "List of LMAC/Division of State Lands Approved Interim Management Activities," issued June 8, 1995, and attached hereto as Exhibit B. The St. Johns River Water Management District shall be added to the list of review agencies for matters related to bridge or culvert replacement, prescribed burning, and replacing existing water control structures or devices. The implementation of these activities requires the review and consent of the St. Johns River Water Management District; correspondence should be directed to Director, Division of Land Management, St. Johns River Water Management District, P.O. Box 1429, Palatka, FL, 32178-1429, (904) 329-4404.

6. UNAUTHORIZED USES: The LESSEE shall, through its agents and employees, prevent to the best of its ability the unauthorized use of the management lands or any use thereof not in conformance with this Agreement.

7. MANAGEMENT PLAN: LESSEE shall prepare and submit a Management Plan for the management lands, in accordance with Section 253.034, Florida Statutes, and Chapter 18-2,

Florida Administrative Code, within twelve months of the effective date of this lease. The Management Plan shall be submitted to the LESSORS for review, comment, and approval. The management lands shall not be developed or physically altered in any way other than what is necessary for security and maintenance of the management lands without the prior written approval of the LESSORS until the Management Plan is approved. The Management Plan shall emphasize the original management concept as approved by the LESSORS at the time of acquisition which established the primary public purpose for which the management lands was acquired. The approved Management Plan shall provide the basic guidance for all management activities and shall be reviewed jointly by the LESSEE and the LESSORS at least every five years. The LESSEE shall not use or alter the management lands except as provided for in the approved Management Plan without the prior written approval of the LESSORS. The Management Plan prepared under this lease agreement 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.

8. ANNUAL REPORTS: Annual reports that summarize management activities, accomplishments, and issues affecting the management lands will be submitted by the LESSEE to the LESSORS.

9. RIGHT TO INSPECT:

A. The LESSORS or their duly authorized agents and employees shall have the right at any and all times to inspect the management lands and works and operations thereon of the LESSEE in any matter pertaining to this Agreement.

B. The LESSORS or their duly authorized agents and employees shall also have the right, at any and all times, to inspect and audit the books and financial records of the LESSEE and any of its licensees as they pertain to the management or recreational use of the management lands.

10. INSURANCE REQUIREMENTS: LESSEE shall procure and maintain adequate fire and extended risk insurance coverage for any improvements or structures located on the management lands in amounts not less than the full insurable replacement value of such improvements by preparing and delivering to the Division of Risk Management, Department of Insurance, a completed Florida Fire Insurance Trust Fund Coverage Request Form immediately upon erection of any structures as allowed in paragraph 5 of this Agreement. Such policies of insurance shall name LESSORS and their duly authorized agents as co-insured. A copy of said form and immediate notification in writing of any erection or removal of structures or other improvements on the management lands and any changes affecting the value of the improvements shall be submitted to the LESSORS. LESSEE shall be financially responsible for any loss due to failure to obtain adequate insurance coverage, and LESSEE's failure to maintain such policies in the amounts set forth shall constitute a breach of this Agreement.

11. LIABILITY: The LESSEE shall bear the sole responsibility for any and all claims for personal injuries or management lands damage arising from, or incident to, the use, occupation, and possession of the management lands. The LESSEE shall maintain a program of insurance

covering its liabilities as prescribed by Section 768.28, F.S. and shall be responsible for the acts or omissions of its officers, employees, servants, and agents in the event that such acts or omissions result in injury to persons or damage the management lands. However, nothing in this Agreement is intended or is to be construed as a waiver of sovereign immunity as provided to the parties signatory hereto under Section 768.28, Florida Statutes, or as otherwise provided by law.

12. ARCHAEOLOGICAL AND HISTORICAL SITES: Execution of this Agreement 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 the management lands is prohibited unless prior authorization has been obtained from the Department of the State, Division of Historical Resources. The Management Plan shall be reviewed by the 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 management lands.

13. EASEMENTS: All easements including, but not limited to, utility easements are expressly prohibited without the prior written approval of LESSORS. Any easement not approved in writing by LESSORS shall be void and without legal effect.

14. SUBLEASES: This Agreement is for the purpose specified herein and subagreements of any nature are prohibited, without the prior written approval of LESSORS. Any subagreement not approved in writing by LESSORS shall be void and without legal effect.

15. SURRENDER OF MANAGEMENT LANDS: Upon termination or expiration of this Agreement, LESSEE shall surrender the management lands to LESSORS. In the event no further use of the management lands or any part thereof is needed, written notification shall be made to the LESSORS at least one (1) year prior to the release of all or any part of the management lands. However, if such notice is given after March 1 of any calendar year, the date of termination shall be the first February 15 following the date of said notice. Notification shall include a legal description, this Agreement and parcel number, and an explanation of the release. The release shall be valid only if approved by LESSORS through execution of a release of Agreement instrument with the same formality as this Agreement. Upon release of all or any part of the management lands or upon expiration or termination of this Agreement, all improvements, including both physical structures and modifications to the management lands, shall become the management lands of the LESSORS, unless LESSORS give written notice to LESSEE to remove any or all such improvements at the expense of LESSEE. The decision to retain any improvements upon termination of this Agreement shall be at the LESSORS' discretion. Prior to surrender of all or any part of the management lands, a representative of the Division of State Lands, Department of Environmental Protection, and the St. Johns River Water Management District shall perform an on-site inspection and the keys to any buildings or gates shall be turned over to them. If the management lands and improvements located thereon do not meet all conditions set forth in paragraph 22, LESSEE shall pay all costs necessary to meet the prescribed conditions.

16. BEST MANAGEMENT PRACTICES: The LESSEE shall implement applicable Best Management Practices for all activities conducted under this Agreement in compliance with

paragraph 18-2.004 (1) (d), Florida Administrative Code, which have been selected, developed, or approved for the protection and enhancement of the management lands.

17. PUBLIC LANDS ARTHROPOD CONTROL PLAN: LESSEE shall identify and subsequently designate to the respective arthropod control district or districts within one year of the effective date of this Agreement all of the environmentally sensitive and biologically high-productive lands contained within the management lands, in accordance with Section 388.4111, Florida Statutes and Chapter 5E-13, Florida Administrative Code, for the purpose of obtaining a public lands arthropod control plan for such lands.

18. TRIPPLICATE ORIGINALS: This Agreement is executed in triplicate originals, each of which shall be considered an original for all purposes.

19. UTILITY FEES: LESSEE shall be responsible for the payment of all charges incurred by the LESSEE for the furnishing of gas, electricity, water and other utilities to the management lands and for having all utilities turned off when the management lands are surrendered.

20. ASSIGNMENT: This Agreement shall not be assigned in whole or in part without the prior written approval of the LESSORS. Any assignment made either in whole or in part without the prior written consent of LESSORS 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 LESSEE in accordance with plans prepared by professional designers and shall require the prior written approval of the LESSORS as to purpose, location, and design. Further, no trees, other than exotic invasive species shall be removed or major land alternation done without the prior written approval of LESSORS. Removable equipment and removable improvements placed on the management lands by LESSEE which do not become a permanent part of the management lands will remain the property of the LESSEE and may be removed by the LESSEE upon termination of this Agreement.

22. OPERATION AND MAINTENANCE OF MANAGEMENT LANDS AND IMPROVEMENTS: LESSEE shall maintain the real property contained within the management lands and any improvements located thereon, in a state of good condition working order and repair including, but not limited to, keeping the management lands free of trash or litter, maintaining all planned improvements as set forth in the Management Plan, meeting all building and safety codes in the location situate, and maintaining all existing roads, fences, ditches, culverts, canals, risers and the like in as good condition as the same may be at the date of the Agreement and as required as needed to secure the management lands and provide safe public access. Notwithstanding the foregoing, any removal, closure, etc. of the above improvements shall be acceptable when the proposed activity is consistent with the goals of conservation, protection, and enhancement of the natural and historical resources within the management lands and the approved Management Plan. All costs for operation and maintenance of the management lands and improvements except those constructed or placed upon the management lands by the LESSORS shall be at the expense of the LESSEE.

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

24. DEFAULT BY THE LESSEE AND TERMINATION BY THE LESSORS: The LESSORS may terminate this Agreement if the LESSEE proceeds in a manner that violates the terms of this Agreement. Agreement violations shall include the following:

A. LESSEE fails to submit a Management Plan in accordance with the terms of this Agreement, or

B. LESSEE fails to proceed in a manner that will implement or complete the actions, tasks, or other aspects of the Management Plan for essential site management, or

C. Construction of permanent structures or other improvements by the LESSEE not authorized by the LESSORS, either directly or indirectly through the approval of the Management Plan, or

D. LESSEE's destruction or degradation of natural systems, rare or endangered habitats that are targeted for preservation, or

E. Violation of Federal, State, or local laws, rules, regulations, or ordinances, or

F. Causing the management lands to be contaminated with hazardous wastes or other pollutants or failure to properly secure the management lands to prevent or impede illegal dumping or degradation of natural habitats, or other unauthorized uses, or

G. LESSEE's failure to comply with the other terms of this Agreement.

If the LESSORS, in their sole opinion, find that the LESSEE has committed a violation of the Agreement, the LESSORS will notify the LESSEE in writing as to the nature of the violation and shall direct the LESSEE on how the LESSEE is to proceed to remedy, resolve, or rectify the Agreement violation. The LESSEE will have sixty (60) days from the receipt of the notification in which to perform the following:

H. Proceed in a manner or provide a schedule for the prompt implementation of the LESSORS' corrective action.

I. Advise the LESSORS how the LESSEE will implement its own corrective action, including a schedule for completion, provided it will address the Agreement violation.

If the LESSEE fails to respond to the LESSORS' notification regarding an Agreement violation or fails to implement corrective action, the LESSEE will be in default of this Agreement and the LESSORS may, at their sole option, terminate this Agreement and recover from LESSEE all damages LESSORS may incur by reason of the default, including, but not limited to, the cost of recovering the management lands or maintain this Agreement in full force and effect and exercise all rights and remedies herein conferred upon LESSORS.

25. NO WAIVER OF DEFAULT: The failure of LESSORS to insist in any one or more instances upon strict performance of any one or more of the terms and conditions of this Agreement shall not be construed as a waiver of such terms and conditions, but the same shall continue in full force and effect, and no waive of LESSORS 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 the LESSORS.

26. TERMINATION: The LESSEE or either of the LESSORS may terminate this Agreement for convenience by giving one (1) year notice in writing of its intent to do so. However, if such notice is given after March 1 of any calendar year, the date of termination shall be the first February 15 following the date of said notice.

27. PROHIBITIONS AGAINST LIENS OR OTHER ENCUMBRANCES: Fee title to the management lands is held by the LESSORS. LESSEE shall not do or permit anything which purports to create a lien or encumbrance of any nature against the management lands including, but not limited to, mortgages or construction liens against the management lands or against any interest of LESSORS therein.

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

29. DAMAGE TO THE MANAGEMENT LANDS:

A. LESSEE shall not do, or suffer to be done, in, on or upon the management lands or as affecting said management lands or adjacent properties, any act which may result in damages or depreciation of value to the management lands or adjacent properties, or any part thereof.

B. LESSEE 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 onto the management lands or any adjacent lands or waters in any manner not permitted by law. For the purposes of the Agreement, "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 or 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 thereunder, all as amended or updated from time to time. In the event of LESSEE's failure to comply with this paragraph, LESSEE shall, at its sole cost and expense, promptly commence and diligently pursue any legally required closure, investigation, assessment, cleanup, decontamination, remediation, restoration and monitoring of (1) the management lands, and (2) all off-site ground and surface waters and lands affected by LESSEE's such failure to comply, as may be necessary to bring the management lands 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 management lands to the condition existing immediately prior to the occurrence which caused the damage. LESSEE's obligations set forth in this paragraph shall survive the termination or expiration of this Agreement. Nothing herein shall relieve LESSEE 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 LESSEE's 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, LESSEE shall report such violation to all applicable governmental agencies having jurisdiction, and to LESSORS, all within the reporting period of the applicable governmental agencies.

30. TAXES AND ASSESSMENTS: If any ad valorem taxes, intangible management lands taxes, personal management lands taxes, mechanic's or materialman's liens, or other taxes or assessments of any kind are assessed or levied lawfully on the management lands based on the LESSEE's use thereof during the term of the Agreement, the LESSEE shall pay same within Thirty (30) days after receiving written notice thereof from the LESSORS. In the event the LESSEE fails to pay all the taxes assessed or levied on the management lands within thirty (30) days after receiving written notice thereof from the LESSORS, the LESSORS may, at their sole option pay said taxes subject to immediate reimbursement thereof in full together with any interest thereon at the maximum rate allowed by law and any administrative costs thereof incurred by the LESSORS, including reasonable attorneys' fees. Failure of the LESSEE to pay said taxes shall constitute a breach of this Agreement.

31. NON-DISCRIMINATION: The LESSEE 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 or conducted on the management lands.

32. ALCOHOL: The possession, consumption, or other use of any alcoholic beverage, intoxicant and unlawful drug or substance by anyone within or on the management lands shall be specifically prohibited.

33. FIREARMS: The possession or use of any weapons or firearms on the management lands shall be prohibited with the exception of employees of the LESSEE, its agents, or officers, or uses associated with authorized hunting.

34. HUNTING: Hunting and trapping of wildlife on the management lands shall be prohibited unless it is approved in writing in connection with exotics and nuisance control or with Type I WMA activities or other activities approved in the Management Plan.

35. SIGNAGE: At all public entrances, public information signage shall be located which shall inform the public of the cooperative project between the LESSEE and the LESSORS and shall advise the public of all permitted opportunities available on the management lands and the location of said opportunities through an information map. Additionally, the LESSEE shall post appropriate signage along the fence along the management lands boundaries and the interior of the management lands to mark and designate trails, parking areas, restrooms, if any, and any prohibited activities for public safety purposes.

36. FEES AND REVENUES:

A. The LESSEE may charge an entrance or user fee to the visitors and users of the management lands after receiving prior written approval from the LESSORS. For any revenue

generating activity, the LESSEE will provide the LESSORS with such information as may be needed to ensure adherence to restrictions on the use of lands purchased with bond proceeds.

B. The LESSEE may explore revenue-producing initiatives that are compatible with the purposes for which the management lands were acquired and related statutory directive after obtaining written approval from the LESSORS. Any revenue that is generated by the LESSEE under these initiatives shall be applied to management and operation costs of the management lands.

37. ACCESS BY LESSORS: The right is reserved to the LESSORS, their officers, employees, agents and assigns to enter upon and travel through and across the management lands which are the subject of this Agreement, any time, for inspection, construction, maintenance, or for any purpose necessary or convenient in connection with water or resource management activities. The St. Johns River Water Management District shall coordinate all construction or maintenance of water management facilities within the management lands with the LESSEE and shall comment on the need for any such facilities or activities when reviewing the Management Plan required by the Agreement.

38. COMPLIANCE WITH LAWS: LESSEE agrees that this Agreement is contingent upon and subject to LESSEE 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.

39. TIME: Time is expressly declared to be of the essence of this Agreement.

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

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

42. BINDING EFFECT: This Agreement will be binding upon and inure to the benefit of the parties hereto, and their personal representatives, successors, and assigns.

43. AMENDMENTS: This Agreement may be amended in writing by mutual consent of the LESSORS and the LESSEE.

44. NOTICES: Any and all notices, requests or other communications hereunder shall be deemed to have been duly given if in writing and if transmitted by hand delivery with receipt therefor, or by registered mail posted prior to the expiration date for such notice, return receipt requested and first class postage prepaid as follows:

To the LESSEE:	Florida Game and Fresh Water Fish Commission 620 South Meridian Street Tallahassee, FL 32399-1600
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To the LESSORS: St. Johns River Water Management District
Division of Land Management
P.O. Box 1429
Palatka, FL 32178-1429

and

Department of Environmental Protection
Division of State Lands
Bureau of Land Management Services
3900 Commonwealth Boulevard
Mail Station 130
Tallahassee, FL 32399-3000

45. CONDITION OF MANAGEMENT LANDS: LESSORS assume no liability or obligation to LESSEE with reference to the condition of the management lands. Management authority is granted for the management lands in an "as is" condition by the LESSORS to LESSEE with LESSORS assuming no responsibility for the care, repair, maintenance or improvement of the management lands for the benefit of LESSEE.

46. NON-WAIVER OF REGULATORY AUTHORITY: Nothing contained in this Agreement shall be construed as a waiver of or contract with respect to the regulatory and permitting authority of the LESSORS as it now or hereafter exists under applicable laws, rules, and regulations.

47. ADMINISTRATIVE FEE: LESSEE shall pay the Florida Department of Environmental Protection, Division of State Lands 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 fractions 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 thereafter shall be due and payable on July 1 of each subsequent year.

In witnesseth whereof, the parties have caused this Agreement to executed on the day and year first above written.

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

Senna Bridges
Witness

Senna Bridges
Print/Type Witness Name

Glenn Muddox
Witness

Glenn Muddox
Print/Type Witness Name

By: Daniel T. Crabb (SEAL)

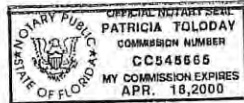
Daniel T. Crabb, Chief
Bureau of Land Management Services
Division of State Lands
Florida Department of Environmental
Protection

"LESSOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 2nd day of June 1997, by Daniel T. Crabb, as Chief, Bureau of Land Management Services, Division of State Lands, Florida Department of Environmental Protection, acting 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 know to me.

(SEAL)



Patricia Toloday
Notary Public, State of Florida

Print/Type Notary Name

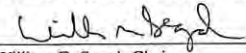
Commission Number

Commission Expires:

Approved as to Form and Legality

By: Sally Klein
DEP Attorney

GOVERNING BOARD OF THE ST. JOHNS
RIVER WATER MANAGEMENT DISTRICT


William E. Segal, Chairman

(SEAL)

ATTEST:

By: 
Otis A. Mason, Secretary

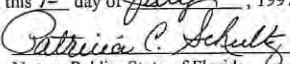
STATE OF FLORIDA
COUNTY OF PUTNAM

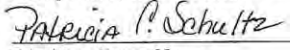
BEFORE ME, an officer duly authorized to take acknowledgments in the State and County aforesaid, personally appeared William M. Segal and Otis A. Mason, to me personally known and known to me to be the Chairman and Secretary, respectively, of ST. JOHNS RIVER WATER MANAGEMENT DISTRICT, a public body existing under Chapter 373, Florida Statutes, who being duly authorized, executed the foregoing document, and they acknowledged before me that they executed the same on behalf of ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.

WITNESS my hand and official seal this 9th day of July, 1997.

(SEAL)



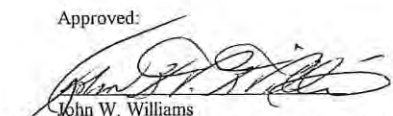

Notary Public, State of Florida


Print/Type Notary Name

Commission Number CC 342545

Commission Expires: 2/6/98

Approved:


John W. Williams
St. Johns River Water Management District
Senior Assistant General Counsel
Office of General Counsel

FLORIDA GAME AND FRESH WATER FISH
COMMISSION

Kim Wright
Witness
Kim Wright
Print/Type Witness Name

Andrea Kniceley
Witness
ANDRENA Kniceley
Print/Type Witness Name

By: *Alan Egbert* (SEAL)
Alan Egbert
Print/Type Name

Its: Executive Director

"LESSEE"

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY
Paul R. [Signature]
Commissioner

STATE OF FLORIDA
COUNTY OF Leon

The foregoing instrument was acknowledged before me this 14th day of May, 1997, by Alan Egbert, as Executive Director, Florida Game and Fresh Water Fish Commission, who is personally known to me or produced _____ as identification.

(SEAL)



Jimmie C. Bevis
Notary Public, State of Florida

JIMMIE C. BEVIS
Print/Type Notary Name

Commission Number

Commission Expires:

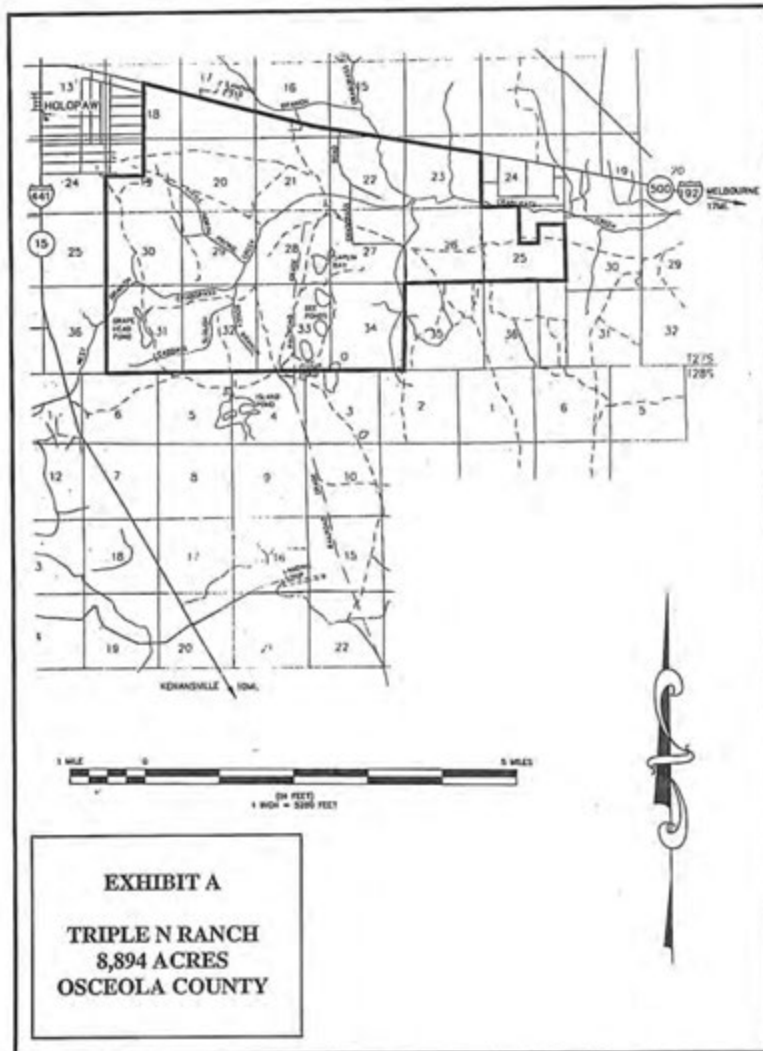


EXHIBIT "A"

LEGAL DESCRIPTION

The NE 1/4 of Section 19, Township 27 South, Range 33 East, except that West 335 feet thereof, Osceola County, Florida.

The South 66 feet of Section 25, Township 27 South, Range 33 East, Osceola County, Florida.

- A N D -

The following lands in Township 27 South, Range 33 East, Osceola County, Florida, to-wit:

The South 1/2 of Section 19 and all of Sections 20 and 26 to 34, inclusive.

Those portions of Sections 15, 16, 17 and 23, lying South of State Road #500, now U. S. Highway #192.

The East 1/2, less the West 335 feet thereof, of Section 18, lying South of State Road #500, now U. S. Highway #192.

Section 21, less the NE 1/4 of the SE 1/4, and less the West 210 feet of the East 420 feet of the SE 1/4 (known as "School lot").

Section 22, lying South of State Road #500, now known as U. S. Highway #192, less the South 1/2 of the NW 1/4 of the Southwest one-quarter and less the South 1/2 of the Southeast one-quarter. The West 1/2, the Southeast 1/4 and the Southeast 1/4 of the Northeast 1/4 of Section 25.

All of the foregoing, less that portion thereof, acquired by CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT, a Public Corporation, in Eminent Domain Proceedings, Civil Action No. 891-69, filed in the Circuit Court of the Ninth Judicial Circuit of Florida, in and for Osceola County, wherein CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT, a Public Corporation is Petitioner and CENTRAL BANK AND TRUST COMPANY, a Florida corporation, as Trustee, et al, are Defendants, wherein an Order of Taking was entered with respect to the property being excepted herein, which Order of Taking is recorded in Circuit Court Minute Book W, Page 542, of the Public Records of Osceola County, Florida, the legal description of the excepted portion being more specifically set forth in an original 14-page description (Exhibit "A" pages 2 through 16 in this excepted portion) attached hereto and made a part hereof.

EXHIBIT "A"

PARCEL 439 CENTRAL BANK AND TRUST COMPANY, A FLORIDA CORPORATION
LANDS IN TOWNSHIP 27 SOUTH, RANGE 33 EAST

That part of Section 15 lying below the 50 foot contour line and Southerly of the South right of way line of State Road No. 500 (also known as U. S. 192) being more particularly described as follows:

From a 5" x 5" concrete monument marking the Southwest (SW) corner of said Section bear South 89 degrees 50'49" East, along the South line of said Section, a distance of 1796.15 feet to the intersection thereof with the said 50 foot contour line and the POINT OF BEGINNING;

Thence, continue along the South line of said Section on a bearing of South 89 degrees 50'49" East, a distance of 1311.05 feet to the intersection thereof with the South right of way line of said State Road No. 500;

Thence, North 81 degrees 19' 57" West, along said right of way line, a distance of 1571.25 feet to the intersection thereof with the said 50 foot contour line;

Thence, South 46 degrees 04'51" East, along said contour line, a distance of 336.32 feet to the POINT OF BEGINNING.

PARCEL 444

That part of Section 21 lying below the 50 foot contour line and being more particularly described as follows:

Begin at a 5" x 5" Osceola County monument marking the Southeast (SE) corner of said Section; said point also being on the said 50 foot contour line; bear North 0 degrees 04' 29" West, along the East line of said Section, a distance of 1332.67 feet to a 4" x 4" concrete monument marking the Southeast (SE) corner of the Northeast one-quarter of the Southeast one-quarter (NE 1/4 of SE 1/4) of said Section;

Thence, North 89 degrees 37' 12" West, along the South line of said Northeast one-quarter of the Southeast one-quarter (NE 1/4 of SE 1/4) a distance of 1333.01 feet to the SouthWest (SW) corner of the said Northeast one-quarter of the Southeast one-quarter (NE 1/4 of SE 1/4);

Thence, North 0 degrees 03' 35" East, along the West line of the said Northeast one-quarter of the Southeast one-quarter (NE 1/4 of SE 1/4) a distance of 461.36 feet to the intersection thereof with the said 50 foot contour line;

Thence, South 85 degrees 51' 55" West, along said contour line, a distance of 226.64 feet;

Thence, North 85 degrees 14' 11" West, a distance of 481.66 feet;

Thence, South 70 degrees 20' 46" West, a distance of 222.99 feet;

Thence, South 9 degrees 57' 50" West, a distance of 375.67 feet;

Thence, South 50 degrees 47' 34" West, a distance of 490.41 feet;

Thence, South 67 degrees 37' 12" West, a distance of 551.54 feet;

Thence, South 76 degrees 11' 06" West, a distance of 314.09 feet;

Thence, South 41 degrees 59' 14" West, a distance of 134.54 feet;

Thence, South 17 degrees 21' 14" West, a distance of 251.45 feet;

Thence, South 31 degrees 54' 29" West, a distance of 117.17 feet;
 Thence, South 81 degrees 34' 23" West, a distance of 136.47 feet;
 Thence, North 50 degrees 11' 40" West, a distance of 234.31 feet;
 Thence, continue along said contour line on a bearing of
 South 13 degrees 46' 42" East, a distance of 289.03 feet
 to the intersection thereof with the South line of said
 Section;
 Thence, South 89 degrees 34' 00" East, along said South
 line, a distance of 1420.58 feet to a 5" x 5" concrete
 monument marking the South one-quarter (5 1/4) corner of
 said Section;
 Thence, continue along the South line of said Section on
 a bearing of South 89 degrees 34' 06" East, a distance of
 31.04 feet to the intersection thereof with the said 50
 foot contour line;
 Thence, North 51 degrees 40' 48" East, a distance of 655.88 feet;
 Thence, North 65 degrees 19' 23" East, a distance of 203.59 feet;
 Thence, East, a distance of 180.00 feet;
 Thence, South 67 degrees 33' 26" East, a distance of 248.85 feet;
 Thence, North 88 degrees 34' 04" East, a distance of 400.12 feet;
 Thence, North 75 degrees 33' 21" East, a distance of 340.77 feet;
 Thence, North 51 degrees 50' 34" East, a distance of 267.07 feet;
 Thence, continue along said contour line on a bearing of
 South 40 degrees 51' 50" East, a distance of 894.56 feet
 to the POINT OF BEGINNING.

PARCEL 449

That part of Section 22 lying Southerly of State Road No. 500
 (also known as U.S. 92) below the 50 foot contour line and being
 more particularly described as follows:

Begin at a 5" x 5" Osceola County monument marking the
 Southeast (SE) corner of said Section bear North 0
 degrees 06' 10" East, along the East line of said
 Section, a distance of 1329.64 feet to a 4" x 4" concrete
 monument marking the Northeast (NE) corner of the

Southeast one-quarter of the Southeast one-quarter (SE 1/4 of SE 1/4) of said Section;

Thence, continue along the East line of said Section on a bearing of North 0 degrees 07' 00" East, a distance of 1330.61 feet to 5" x 5" Osceola County monument marking the East one-quarter (E 1/4) corner of said Section;

Thence, continue along the East line of said Section on a bearing of North 0 degrees 06' 04" East, a distance of 732.07 feet to the intersection thereof with the said 50 foot contour line;

Thence, North 61 degrees 33' 25" West, along said contour line, a distance of 491.63 feet;

Thence, North 27 degrees 28' 28" West, a distance of 563.56 feet;

Thence, North 16 degrees 41' 57" West, a distance of 1038.64 feet to the intersection thereof with the Southerly right of way line of said State Road No. 500;

Thence, North 81 degrees 19' 57" West, along said right of way line a distance of 1235.93 feet to the intersection thereof with the North line of said Section;

Thence, North 89 degrees 50' 49" West, along said North line, a distance of 1311.05 feet to the intersection thereof with the said 50 foot contour line;

Thence, South 46 degrees 04' 51" East, along said contour line, a distance of 626.54 feet;

Thence, South 35 degrees 25' 01" East, a distance of 552.18 feet;

Thence, South 7 degrees 12' 51" East, a distance of 398.15 feet;

Thence, South 37 degrees 18' 14" West, a distance of 660.02 feet;

Thence, South 21 degrees 09' 06" East, a distance of 900.68 feet;

Thence, South 15 degrees 33' 16" East, a distance of 503.44 feet;

Thence, South 21 degrees 48' 05" East, a distance of 161.55 feet;

Thence, South 18 degrees 26' 06" West, a distance of 142.30 feet;

Thence, South 74 degrees 34' 40" West, a distance of 300.83 feet;
Thence, South 46 degrees 35' 28" West, a distance of 254.66 feet;
Thence, South 51 degrees 57' 11" West, a distance of 292.06 feet;
Thence, South 74 degrees 14' 56" West, a distance of 202.61 feet;
Thence, North 53 degrees 28' 16" West, a distance of 336.01 feet;
Thence, North 80 degrees 20' 25" West, a distance of 195.78 feet;
Thence, North 73 degrees 51' 23" West, a distance of 637.12 feet;

Thence, continue along said contour line on a bearing of North 66 degrees 06' 04" West, a distance of 784.28 feet to the intersection thereof with the West line of said Section;

Thence, South 0 degrees 02' 29" East, along said West line, a distance of 816.59 feet to a 4" x 4" concrete monument marking the Southwest (SW) corner of the Northwest one-quarter of the Southwest one-quarter (NW 1/4 of SW 1/4) of said Section;

Thence, continue along the West line of said section on a bearing of South 0 degrees 04' 29" East, a distance of 1332.67 feet to a 5" x 5" Osceola County monument marking the Southwest (SW) corner of said Section;

Thence, North 89 degrees 51' 00" East, along the South line of said Section, a distance of 2653.45 feet to a 5" x 5" concrete monument marking the South one-quarter (S 1/4) corner of said Section;

Thence, continue along the South line of said Section on a bearing of North 89 degrees 49' 30" East, a distance of 2657.19 feet to the POINT OF BEGINNING.

LESS, HOWEVER, the South one-half of the Southeast one-quarter (S 1/2 of SE 1/4) and that part of the South one-half of the Northwest one-quarter of the Southwest one-quarter (S 1/2 of NW 1/4 of SW 1/4) lying within the above described land.

PARCEL 443

That part of Section 23 lying below the 50 foot contour line and being more particularly described as follows:

Begin at a 5" x 5" concrete monument marking the Southeast (SE) corner of said Section, bear North 0 degrees 15' 55" East, along the East line of said Section, a distance of 1430.98 feet to the intersection thereof with the said 50 foot contour line;

Thence, North 80 degrees 40' 32" West, along said contour line a distance of 709.33 feet;

Thence, North 28 degrees 10' 43" West, a distance of 476.47 feet;

Thence, North 70 degrees 06' 53" West, a distance of 499.80 feet;

Thence, North 37 degrees 57' 15" West, a distance of 317.06 feet;

Thence, North 44 degrees 22' 13" West, a distance of 643.51 feet;

Thence, North 22 degrees 26' 34" West, a distance of 248.85 feet;

Thence, North 2 degrees 36' 09" East, a distance of 330.34 feet;

Thence, North 81 degrees 52' 12" West, a distance of 106.07 feet;

Thence, South 2 degrees 48' 56" West, a distance of 305.37 feet;

Thence, South 15 degrees 08' 28" East, a distance of 440.28 feet;

Thence, South 36 degrees 23' 04" West, a distance of 354.01 feet;

Thence, South 27 degrees 33' 10" West, a distance of 518.84 feet;

Thence, South 73 degrees 18' 03" West a distance of 261.01 feet;

Thence, North 61 degrees 08' 40" West, a distance of 279.73 feet;

Thence, South 88 degrees 24' 32" West, a distance of 720.28 feet;

Thence, South 63 degrees 41' 35" West, a distance of 496.41 feet;

Thence, North 78 degrees 25' 29" West, a distance of 423.62 feet;

Thence, continue along said contour line on a bearing of North 67 degrees 48' 16" West, a distance of 691.34 feet to the intersection thereof with the West line of said Section;

Thence, South 0 degrees 07' 00" West, along said West line, a distance of 788.00 feet to a 4" x 4" concrete monument marking the Northwest (NW) corner of the Southwest one-quarter of the Southwest one-quarter (SW 1/4 of SW 1/4);

Thence, continue along the West line of said Section on a bearing of South 0 degrees 06' 10" West, a distance of 1329.64 feet to a 5" x 5" Osceola County monument marking the Southwest (SW) corner of said Section;

Thence, North 89 degrees 56' 23" East, along the South line of said Section, a distance of 5287.43 feet to the POINT OF BEGINNING.

PARCEL 453

That part of Section 25 lying below the 50 foot contour line and being more particularly described as follows:

Begin at an Osceola County monument marking the Northeast (NE) corner of said Section, bear South 89 degrees 53' 12" West, along the North line of said Section, a distance of 3147.20 feet to a 4" x 4" concrete monument marking the North one-quarter (N 1/4) corner of said Section;

Thence, continue along said North line on a bearing of to a 5" x 5" concrete monument marking the Northwest (NW) corner of said Section;

Thence, South 0 degrees 09' 29" East, along the West line of said Section, a distance of 1162.74 feet to the intersection thereof with the said 50 foot contour line;

Thence, South 62 degrees 58' 40" East, along said contour line, a distance of 520.26 feet;

Thence, North 76 degrees 08' 20" East, a distance of 396.55 feet;

Thence, North 68 degrees 35' 13" East, a distance of 273.91 feet;

Thence, South 87 degrees 08' 15" East, a distance of 400.50 feet;

Thence, South 77 degrees 16' 32" East, a distance of 317.80 feet;

Thence, South 56 degrees 37' 20" East, a distance of 508.94 feet;

Thence, South 45 degrees 44' 39" East, a distance of 272.26 feet;

Thence, South 38 degrees 39' 35" East, a distance of 333.26 feet;

Thence, South 22 degrees 57' 30" East, a distance of 363.57 feet;

Thence, North 22 degrees 18' 22" East, a distance of 421.54 feet;
Thence, North 45 degrees 00' 00" East, a distance of 233.35 feet;
Thence, North 60 degrees 48' 09" East, a distance of 194.74 feet;
Thence, North 72 degrees 36' 24" East, a distance of 713.79 feet;
Thence, North 80 degrees 03' 03" East, a distance of 501.39 feet;
Thence, South 73 degrees 53' 55" East, a distance of 504.80 feet;
Thence, South 11 degrees 55' 46" East, a distance of 362.84 feet;
Thence, South 48 degrees 00' 46" East, a distance of 134.54 feet;
Thence, South 78 degrees 41' 24" East, a distance of 127.48 feet;
Thence, North 61 degrees 30' 16" East, a distance of 199.12 feet;
Thence, South 74 degrees 44' 42" East, a distance of 114.02 feet;

Thence, continue along said contour line on a bearing of
South 34 degrees 17' 07" East, a distance of 474.39 feet
to the intersection thereof with the East line of said
Section;

Thence, North 0 degrees 13' 44" West, along said East
line, a distance of 1588.77 feet to a 5" x 5" concrete
monument marking the Northwest (NW) corner of Section 30,
as shown on the plat of George W. Hopkins lands as
recorded in Plat Book 1, page 123, Osceola County,
Florida, public records;

Thence, continue along the East line of said Section on a
bearing of North 0 degrees 03' 38" East, a distance of
767.74 feet to the POINT OF BEGINNING.

LESS, HOWEVER, the North one-half of the Northeast one-quarter (N
1/2 of NE 1/4) and that part of the Southwest one-quarter of the
Northeast one-quarter (SW 1/4 of NE 1/4) lying within the above
described lands.

PARCEL 460

That part of Section 26, lying below the 50 foot contour line and being more particularly described as follows:

Begin at a 5" x 5" Osceola County monument marking the Northwest (NW) corner of said section 26, bear South 0 degrees 06' 42" West, along the West line of said Section, a distance of 2657.76 feet to a 5" x 5" Osceola County monument marking the West one-quarter (W 1/4) corner of said Section;

Thence, continue along the West line of said Section, on a bearing of South 0 degrees 01' 50" West, a distance of 578.53 feet to the intersection thereof with the said 50 foot contour line;

Thence, North 38 degrees 54' 15" East, along said contour line, a distance of 254.12 feet;

Thence, North 52 degrees 21' 09" East, a distance of 1105.10 feet;

Thence, North 70 degrees 20' 46" East, a distance of 297.32 feet;

Thence, South 79 degrees 22' 49" East, a distance of 244.18 feet;

Thence, North 78 degrees 20' 59" East, a distance of 495.20 feet;

Thence, North 30 degrees 34' 45" East, a distance of 255.54 feet;

Thence, North 68 degrees 29' 55" East, a distance of 177.34 feet;

Thence, North 50 degrees 02' 33" East, a distance of 241.35 feet;

Thence, North 22 degrees 37' 12" East, a distance of 260.00 feet;

Thence, North 38 degrees 39' 35" East, a distance of 576.28 feet;

Thence, North 55 degrees 10' 32" East, a distance of 280.18 feet;

Thence, South 82 degrees 52' 30" East, a distance of 241.87 feet;

Thence, South 54 degrees 46' 57" East, a distance of 208.09 feet;

Thence, South 38 degrees 39' 35" East, a distance of 256.12 feet;

Thence, South 20 degrees 26' 58" West, a distance of 314.84 feet;

Thence, South 7 degrees 07' 30" East, a distance of 282.18 feet;

Thence, South 32 degrees 11' 45" East, a distance of 319.06 feet;

Thence, South 84 degrees 17' 22" East, a distance of 100.50 feet;
 Thence, North 15 degrees 49' 57" East, a distance of 348.21 feet;
 Thence, North 35 degrees 08' 03" East, a distance of 495.23 feet;
 Thence, North 49 degrees 30' 50" East, a distance of 269.54 feet;
 Thence, North 74 degrees 24' 26" East, a distance of 446.43 feet;
 Thence, continue along said contour line on a bearing of
 South 77 degrees 22' 50" East, a distance of 314.12 feet
 to an intersection thereof with the East line of said
 Section;
 Thence, North 0 degrees 09' 29" West, along said East
 line, a distance of 1162.74 feet to a 5" x 5" concrete
 monument marking the Northeast (NE) corner of said
 Section;
 Thence, South 89 degrees 56' 23" West, along the North
 line of said Section, a distance of 5287.43 feet to the
 POINT OF BEGINNING.

PARCEL 461

That part of Section 27 lying below the 50 foot contour line and
 being more particularly described as follows:

Begin at a 5" x 5" Osceola County monument marking the
 Northeast (NE) corner of said Section, bear South 89
 degrees 49' 30" West, along the North line of said
 Section, a distance of 2657.19 feet to a 5" x 5" concrete
 monument marking the North one-quarter (N 1/4) corner of
 said Section;

Thence, continue along the North line of said section on
 a bearing of South 89 degrees 51' 00" West, a distance of
 2653.45 feet to a 5" x 5" Osceola County monument marking
 the Northwest (NW) corner of said Section;

Also being the intersection thereof with the 50 foot
 contour line;

Thence, South 23 degrees 22' 50" East, along said contour line, a distance of 515.83 feet;

Thence, North 84 degrees 33' 35" East, a distance of 421.90 feet;

Thence, South 50 degrees 23' 22" East, a distance of 188.22 feet;

Thence, South 62 degrees 44' 41" East, a distance of 185.61 feet;

Thence, North 26 degrees 33' 54" East, a distance of 67.08 feet;

Thence, North 24 degrees 46' 31" West, a distance of 143.18 feet;

Thence, North 7 degrees 18' 21" East, a distance of 196.60 feet;

Thence, North 76 degrees 19' 43" East, a distance of 571.18 feet;

Thence, South 87 degrees 17' 58" East, a distance of 530.59 feet;

Thence, South 81 degrees 15' 14" East, a distance of 526.12 feet;

Thence, South 66 degrees 02' 15" East, a distance of 492.44 feet;

Thence, South 48 degrees 17' 21" East, a distance of 616.20 feet;

Thence, South 41 degrees 15' 03" East, a distance of 1243.63 feet;

Thence, South 57 degrees 25' 33" East, a distance of 427.20 feet;

Thence, South 14 degrees 33' 37" East, a distance of 397.78 feet;

Thence, South 12 degrees 58' 31" West, a distance of 1113.43 feet;

Thence, South 21 degrees 22' 14" West, a distance of 493.96 feet;

Thence, South 1 degree 21' 50" West, a distance of 420.12 feet;

Thence, South 24 degrees 12' 04" East, a distance of 487.88 feet;

Thence, continue along said contour line on a bearing of south 3 degrees 55' 15" East, a distance of 510.78 feet to the intersection thereof with the South line of said Section;

Thence, North 89 degrees 58' 02" East, along said South line, a distance of 514.68 feet to the intersection thereof with the said 50 foot contour line;

Thence, North 17 degrees 12' 35" West, along said contour line, a distance of 302.85 feet;

Thence, North 37 degrees 52' 30" West, a distance of 342.05 feet;

Thence, North 9 degrees 27' 44" East, a distance of 273.72 feet;

Thence, North 30 degrees 01' 06" East, a distance of 259.86 feet;

Thence, North 17 degrees 22' 27" East, a distance of 853.96 feet;

Thence, continue along said 50 foot contour line, on a bearing of North 33 degrees 29' 10" East, a distance of 254.49 feet to the intersection thereof with the East line of said Section;

Thence, North 0 degrees 01' 50" East, along said East line, a distance of 578.53 feet to a 5" x 5" Osceola County monument marking the East one-quarter (E 1/4) corner of said Section;

Thence, continue along the East line of said Section on a bearing of North 0 degrees 06' 42" East, a distance of 2657.76 feet to the POINT OF BEGINNING.

PARCEL 462

That part of Section 28 lying below the 50 foot contour line being more particularly described as follows:

From a 5" x 5" Osceola County monument marking the Northwest (NW) corner of said Section, bear South 89 degrees 34' 00" East, along the North line of said Section, a distance of 1245.67 feet to the intersection thereof with the said 50 foot contour line and the POINT OF BEGINNING;

Thence, South 4 degrees 14' 11" West, along said contour line, a distance of 119.62 feet;

Thence, South 86 degrees 13' 18" West, a distance of 531.15 feet;

Thence, South 29 degrees 44' 42" West, a distance of 362.80 feet;

Thence, continue along said contour line on a bearing of South 49 degrees 41' 34" West, a distance of 685.49 feet to the intersection thereof with the West line of said Section;

Thence, South 0 degrees 15' 04" East, along said West line, a distance of 2367.87 feet to the intersection thereof with the said 50 foot contour line;

Thence, North 29 degrees 20' 25" East, along said contour line, a distance of 678.29 feet;

Thence, North 12 degrees 02' 44" East, a distance of 1221.90 feet;

Thence, North 30 degrees 27' 56" East, a distance of 197.23 feet;
Thence, North 50 degrees 49' 35" East, a distance of 348.28 feet;
Thence, North 59 degrees 58' 54" East, a distance of 259.86 feet;
Thence, North 84 degrees 42' 36" East, a distance of 271.15 feet;
Thence, North 64 degrees 26' 24" East, a distance of 382.43 feet;
Thence, continue along said contour line on a bearing of North 48 degrees 51' 59" East, a distance of 1175.58 feet to the intersection thereof with the North line of said Section;

Thence, North 89 degrees 34' 06" West, along said North line, a distance of 31.04 feet to a 5" x 5" concrete monument marking the North one-quarter (N 1/4) corner of said Section;

Thence, continue along said North line on a bearing of North 89 degrees 34' 00" West, a distance of 1420.58 feet to the POINT OF BEGINNING.

PARCEL 463

That part of Section 29, lying below the 50 foot contour line and being more particularly described as follows:

From a 5" x 5" Osceola County monument marking the Northeast (NE) corner of said Section, bear South 0 degrees 15' 04" East, along the East line of said Section, a distance of 922.15 feet to the intersection thereof with the said 50-foot contour line and the POINT OF BEGINNING.

Thence, South 49 degrees 41' 34" West, along said contour line, a distance of 265.22 feet;

Thence, South 11 degrees 18' 36" West, a distance of 305.94 feet;
Thence, South 29 degrees 13' 09" East, a distance of 338.01 feet;
Thence, South 18 degrees 10' 41" West, a distance of 352.60 feet;
Thence, South 44 degrees 32' 56" West, a distance of 449.03 feet;
Thence, South 6 degrees 42' 35" West, a distance of 342.34 feet;
Thence, South 20 degrees 11' 09" West, a distance of 724.50 feet;
Thence, South 11 degrees 28' 55" West, a distance of 326.53 feet;

Thence, South 25 degrees 49' 16" West, a distance of 172.19 feet;
 Thence, West, a distance of 55.00 feet;
 Thence, North 32 degrees 47' 58" West, a distance of 267.68 feet;
 Thence, North 16 degrees 15' 37" West, a distance of 375.00 feet;
 Thence, North 46 degrees 07' 24" West, a distance of 360.69 feet;
 Thence, North 71 degrees 38' 28" West, a distance of 1190.60 feet;
 Thence, South 50 degrees 26' 25" East, a distance of 1342.48 feet;
 Thence, South 40 degrees 39' 24" East, a distance of 560.22 feet;
 Thence, South 14 degrees 49' 35" West, a distance of 175.86 feet;
 Thence, South 54 degrees 54' 15" West, a distance of 226.11 feet;
 Thence, South 30 degrees 32' 51" West, a distance of 354.15 feet;
 Thence, South 59 degrees 10' 20" West, a distance of 361.00 feet;
 Thence, South 9 degrees 43' 35" West, a distance of 177.55 feet;
 Thence, South 43 degrees 40' 04" East, a distance of 304.14 feet;
 Thence, South 58 degrees 36' 35" East, a distance of 345.58 feet;
 Thence, North 68 degrees 37' 46" East, a distance of 370.47 feet;
 Thence, North 28 degrees 28' 27" East, a distance of 335.60 feet;
 Thence, North 34 degrees 59' 31" East, a distance of 244.13 feet;
 Thence, North 45 degrees 12' 36" East, a distance of 965.21 feet;
 Thence, continue along said contour line on a bearing of North 14 degrees 22' 22" East, a distance of 695.49 feet to the intersection thereof with the East line of said Section 29;
 Thence, North 0 degrees 15' 04" West, a distance of 2367.87 feet to the POINT OF BEGINNING.

PARCEL 464

That part of Section 34, lying below the 50 foot contour line and being more particularly described as follows:

From a 5" x 5" concrete monument marking the Northwest (NW) corner of said Section 34, bear North 89 degrees 58' 02" East, along the North line of said Section, a distance of 4504.80 feet to the intersection thereof with the said 50 foot contour and the POINT OF BEGINNING; Thence, South 46 degrees 29' 07" East, along said contour line, a distance of 399.99 feet; Thence, North 87 degrees 42' 34" East, a distance of 125.10 feet; Thence, continue along said contour line on a bearing of North 20 degrees 12' 03" East, a distance of 288.45 feet to the intersection thereof with the North line of said Section; Thence, South 89 degrees 58' 02" West, along said North line, a distance of 514.68 feet to the POINT OF BEGINNING.

SUBJECT to the following:

1. Hercules Powder Company, a Delaware Corporation in Sections 15, 21, 22, 23, 25, 26, 27, 28, 29 and 34.
2. Osceola County and Advance Home Building Corporation, by reason of certain easements recorded in Official Records Book 107, page 317, in Sections 15, 22, 26, 27, 28 and 29.

THE BEARINGS refer to the standard plane rectangular coordinate system for the East one of Florida.

ALSO LESS AND EXCEPT r. as 1, 2, and 3 described as 1. as:

PARCEL 1

CRABGRASS ROAD, BEING A PORTION OF THOSE LANDS DEDICATED TO THE PUBLIC AS EASEMENTS FOR ROAD PURPOSES IN OFFICIAL RECORDS BOOK 107, PAGE 317 AND OFFICIAL RECORDS BOOK 97, PAGE 277 OF THE PUBLIC RECORDS OF OSCEOLA COUNTY AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A STRIP OF LAND 33.0' IN WIDTH LYING EACH SIDE OF THE FOLLOWING DESCRIBED LINE:

AS A POINT OF REFERENCE, COMMENCE AT THE NORTHWEST CORNER OF SECTION 22, TOWNSHIP 27S, RANGE 33E; THENCE RUN N 00°00'09" E, A DISTANCE OF 481.07' TO A NON-TANGENT CIRCULAR CURVE CONCAVE TO THE NORTH, HAVING A RADIUS OF 22951.16', SAID CURVE BEING THE SOUTH R/W LINE OF US192, HAVING A R/W WIDTH OF 66.0'; THENCE SE ALONG SAID R/W CURVE TO THE LEFT THRU A CENTRAL ANGLE OF 01°50'44" A DISTANCE OF 739.33' (CHORD BEARING S 80°07'13" E, CHORD LENGTH 739.30) TO THE POINT OF BEGINNING; THENCE RUN S 07°09'36" W, A DISTANCE OF 505.28'; THENCE RUN S 0°36'09" W, A DISTANCE OF 1995.00'; THENCE RUN S 15°11'41" E, A DISTANCE OF 548.65'; THENCE RUN S 34°33'11" E, A DISTANCE OF 255.00'; THENCE RUN S 43°51'11" E, A DISTANCE OF 620.20' TO A POINT 33.0' E AND 7.97' S OF THE NE CORNER OF THE S 1/2 OF NW 1/4 OF SW 1/4 OF SECTION 22 TOWNSHIP 27S RANGE 33E; THENCE RUN S 00°00'19" W PARALLEL WITH THE E. LINE OF THE W 1/2 OF THE SW 1/4 OF SAID SECTION 22 TOWNSHIP 27S RANGE 33E, A DISTANCE OF 1999.40' TO THE NORTH LINE OF SECTION 27 TOWNSHIP 27S RANGE 33E; THENCE CONTINUE S 0°00'19" W, A DISTANCE OF 342.20'; THENCE RUN S 03°24'58" E, A DISTANCE OF 2312.88' TO A POINT ON THE SOUTH LINE OF THE NW 1/4 OF SECTION 27 TOWNSHIP 27S RANGE 33E, SAID POINT BEING S 89°55'33" W, A DISTANCE OF 1154.75' FROM THE SE CORNER OF THE NW 1/4 OF SAID SECTION 27 TOWNSHIP 27S RANGE 33E; THENCE RUN N 89°55'33" E, A DISTANCE OF 3809.77' TO THE E 1/4 CORNER OF SECTION 27; THENCE RUN S 00°04'53" W, A DISTANCE OF 2658.94', TO THE SE CORNER OF SAID SECTION 27 AND THE END OF SAID LINE.

TOGETHER WITH:

THE W. 66.0' OF THE SW 1/4 OF SECTION 26 TOWNSHIP 27S RANGE 33E, AND THE S. 66.0' OF SECTION 26 TOWNSHIP 27S RANGE 33E, AND THE S. 66.0' OF THE SW 1/4 OF SECTION 25 TOWNSHIP 27S RANGE 33E, THE S 66.0 FEET OF THE SW 1/4 OF THE SE 1/4 OF SECTION 25, TOWNSHIP 27S RANGE 33E, AND THE W 25.0' OF THE S 66.0' OF THE SE 1/4 OF THE SE 1/4 OF SECTION 25, TOWNSHIP 27S RANGE 33E.

ALL OF THE FOREGOING, LESS THAT PORTION THEREOF, LYING WITHIN THE LANDS ACQUIRED BY CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT, A PUBLIC CORPORATION, IN EMINENT DOMAIN PROCEEDINGS, CIVIL CIRCUIT OF FLORIDA, IN AND FOR OSCEOLA COUNTY, WHEREIN CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT, A PUBLIC CORPORATION IS PETITIONER AND CENTRL BANK AND TRUST COMPANY, A FLORIDA CORPORATION, AS TRUSTEE, ET AL, ARE DEFENDANTS, WHERE IN AN ORDER OF TAKING WAS ENTERED WITH RESPECT TO THE PROPERTY BEING EXCEPTED HEREIN, WHICH ORDER OF TAKING IS RECORDED IN CIRCUIT COURT MINUTE BOOK W, PAGE 542, OF THE PUBLIC RECORDS OF OSCEOLA COUNTY.

END OF PARCEL 1

PARCEL 2

The NW 1/4 of the NW 1/4 of the SW 1/4 of Section 22, Township 27 South, Range 33 East, Osceola County, Florida, lying West of the existing County roadway (Crabgrass Road), LESS that portion thereof lying below the 50.0 ft. contour line which was acquired by Central and Southern Florida Flood Control District, as filed and recorded in O.R. Book 320, Page 395 of the Public Records of Osceola County, Florida.

END OF PARCEL 2

PARCEL 3

A 6.69 acre parcel of land lying in Range 33 East, Osceola County, Florida, described as lying South of the South boundary of Township 27 South, as originally surveyed by the U.S. General Land Office in 1843 and reestablished or "restored" by the Florida Department of Natural Resources in 1985 (F.D.N.R. Contract 2907), and North of the "as occupied" boundary line as shown on a 25 page survey map by Regional Engineers, Planners & Surveyors, Inc. (drawing 94-665-1, Job no. 94-665 surveyed in October and November, 1994); the West boundary line of the parcel being the West line of Range 33 East projected South from the point of intersection of said West line with the above mentioned "restored" line; the East boundary line of the parcel being the East line of Section 34, Township 27 South, Range 33 East projected South from the point of intersection of said East line with the above mentioned "restored" line.

END OF PARCEL 3

EXHIBIT B

6/8/95

LIST OF LMAC/DIVISION OF STATE LANDS APPROVED INTERIM MANAGEMENT ACTIVITIES

The activities listed below may be initiated by an agency on state-owned uplands currently under lease from the Board of Trustees, or upon receipt by the Division of State Lands of an executed Interim Management Letter for new acquisitions, without referral to the Land Management Advisory Council (LMAC) or further approval from the Division of State Lands. The activities are considered approved in concept by Chapter 253, F.S., and are acceptable and necessary as routine custodial care or maintenance during the period of time between acquisition and approval of a land management plan for the property. In some cases, review of the activity by the LMAC representative from the Department of State's, Division of Historical Resources (DOS), the Department of Environmental Protection and/or the Florida Natural Areas Inventory (FNAI), may be required prior to initiating the activity. The agency requiring such additional review is indicated following the activity.

The interim management activities have been designated as either (A) or (B) activities based upon the following requirements for review:

- A. No review required.
- B. DHR, FNAI and/or DEP review and concurrence required, as indicated.

Any activity not specifically listed below must be submitted to the Division of State Lands and LMAC for review.

1. Posting.
 - A. Posting areas that are deemed by the manager to be potentially hazardous to the public, and posting those areas where public use may result in damage to state-owned lands.
2. Law enforcement and protection.
 - A. Patrolling the property for improper use of state-owned lands, and providing appropriate law enforcement and resource protection.
3. Management plan development.
 - A. Initiating development of a management plan for the property.
4. Bridge or culvert replacement and/or repair.
 - A. Repair or replacement of any wooden trestle bridges or poured culverts, regardless of age, or any bridge built after 1945.
 - B. Repair or replacement of any other bridges or culverts (DHR).
5. Road repairs.
 - A. Repairing existing roadbeds, when such repairs are minor in nature and necessary to assure safe and reasonable access for the public and for agency personnel. Upgrading roads (i.e., widening, paving, etc.) is not authorized by this letter.
6. Establishing parking areas.
 - A. Establishing temporary parking locations along existing accessways when a disturbed area is

available and subsurface ground disturbance will not exceed 6 inches. Such parking should represent the minimum square footage needed to provide for public access.

- B. Establishing temporary parking locations along existing accessways when a disturbed area is available and subsurface ground disturbance will exceed 6 inches (DOS). Such parking should represent the minimum square footage needed to provide for public access.

7. Exotic or off-site species control.

- A. Controlling invasive exotic or off-site species using methods that do not require ground disturbance, such as prescribed burning, girdling, or herbicide injection. (Note: sod removal of exotic pasture grasses represents an approved exception to the ground disturbance prohibition)

8. Prescribed burning.

- A. Implementing prescribed burning using existing firelines. Improvement of existing lines is limited to reworking with a re-work harrow.
- B. Implementing prescribed burning using new firelines (DOS/DEP/FNAI).

9. Fencing and gating.

- A. Installing fencing and gating or removing deteriorated or unneeded fences, gates or signs.

10. Removal of structures.
 - B. Removal of old, deteriorated or unsafe structures (DOS).
11. Replacing existing water control structures or devices.
 - A. Removing or replacing existing water control structures, including culverts, wellheads, flashboard risers, etc. provided that the activity is properly permitted and clearly consistent with the project assessment or design documents prepared during the land acquisition process.
12. Wildlife habitat enhancement.
 - A. Enhancing wildlife habitat using methods that do not include alteration of native habitat. Such activities shall include installing nest structures or towers for raptors such as osprey or eagles.
Installation of food plots is not authorized.
13. Trash.
 - A. Removal of trash and debris.
14. Personnel.
 - A. Establishing personnel on site in existing facilities.

Activities requiring review by the Department of State (DOS) should be directed to Ms. Susan Herring, Department of State, Division of Historical Resources, R. A. Gray Building, Room 423, Tallahassee, Florida 32399, (904) 487-2333.

Activities requiring review by the Florida Natural Areas Inventory (FNAI) should be directed to Mr. Bobby Hattaway, Florida Natural Areas Inventory, 1018 Thomasville Road, Suite 200-C, Tallahassee, Florida 32302, (904) 224-8207/224-0626.

Activities requiring review by the Department of Environmental Protection (DEP) should be directed to Mr. Jim Stevenson, Department of Environmental Protection, Office of Resource Management, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, (904) 488-4892 or 488-0784.

Please provide copies of all correspondence to and from FNAI, DEP, and/or the Department of State to Mr. Hank Vinson, Department of Environmental Protection, Division of State Lands, 3900 Commonwealth Boulevard, Mail Station 130, Tallahassee, Florida 32399-3000, (904) 488-2291.

The authority granted herein in no way waives the authority and/or jurisdiction of any governmental entity. Implementation of these upland activities may require permits and/or authorization from other federal or state agencies with jurisdiction over these particular activities. Separate approval for any activities affecting the use of state-owned submerged lands must be requested through the filing of a joint application with the Department of Environmental Protection and the United States Army Corps of Engineers. Please forward a copy of all permits for our lease file upon issuance.

12.2 Lease Agreement # 4226, Amendment 3

ATL1

161.19 Acres

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT

TRUST FUND OF THE STATE OF FLORIDA

AMENDMENT 3 TO LEASE NUMBER 4226

TRIPLE N RANCH II

THIS LEASE AMENDMENT is entered into this 2ND day of October, 2001, by and between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred to as "LESSOR" and STATE OF FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION, hereinafter referred to as "LESSEE";

W I T N E S S E T H

WHEREAS, LESSOR, by virtue of Section 253.03, Florida Statutes, holds title to certain lands and property for the use and benefit of the State of Florida; and

WHEREAS, on May 3, 2000, LESSOR and LESSEE entered into Lease Number 4226; and

WHEREAS, LESSOR and LESSEE desire to amend the lease to add land to the leased property.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in Exhibit "A" of Lease Number 4226 is hereby amended to include the real property described in Exhibit "A," attached hereto, and by reference made a part hereof.

2. It is understood and agreed by LESSOR and LESSEE that in each and every respect the terms of the Lease Number 4226 except as amended shall remain unchanged and in full force and effect and the same are hereby ratified, approved and confirmed by LESSOR and LESSEE.

IN WITNESS WHEREOF, the parties have caused this Lease
Amendment 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

Judy Woodard
Witness

Judy Woodard
Print/Type Witness Name

Fredrica W. Jones
Witness

Fredrica W. Jones
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

2nd The foregoing instrument was acknowledged before me this
day of October, 2001, by Gloria C. Nelson,
Operations and Management Consultant Manager, Bureau of Public
Land Administration, Division of State Lands, 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. She is personally known to me.



Sylvia S. Roberts
MY COMMISSION # DD035841 EXPIRES
July 25, 2005
BONDED THRU TROY FARM INSURANCE, INC.

Sylvia S. Roberts
Notary Public, State of Florida

Print/Type Notary Name

Commission Number:

Commission Expires:

Approved as to Form and Legality

By: Sam H. Hise
DEP Attorney

STATE OF FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

PA Doerr
Witness

PA Doerr
Print/Type Witness Name

Florida Parrish
Witness

Florida Parrish
Print/Type Witness Name

By: T. Breault (SEAL)

Timothy A. Breault
Print/Type Name

Title: Assistant Division Director

"LESSEE"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this
14th day of September, 2000, by Timothy A. Breault
as Asst. Division Director, on behalf of State of Florida Fish
and Wildlife Conservation Commission. He/she is personally known
to me.

Florida Parrish
Notary Public, State of Florida
Florida Parrish
Print/Type Notary Name

Commission Number:



Florida Parrish
MY COMMISSION # DD041441 EXPIRES
July 11, 2005
BONDED THRU TROY FAH INSURANCE, INC.

Commission Expires:

EXHIBIT "A"
LEGAL DESCRIPTION

This instrument Prepared By and
Please Return To:
Joseph R. Boyd, Esquire
BOYD, LINDSEY, BRANCH & SLIGER, P.A.
1407 Piedmont Drive East
Tallahassee, Florida 32312

Rec'd 5/3/01

WARRANTY DEED
(STATUTORY FORM - SECTION 689.02, F.S.)

THIS INDENTURE, made this 6th day of April, A.D. 2001,
between CARLOS V. CAMPOS AND CAROLISA HAVILAND, whose post
office address is set forth below, grantor, and the BOARD OF TRUSTEES OF
THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF
FLORIDA, whose post office address is set forth below, grantee,
Environmental Protection, Division of State Lands, 3900 Commonwealth
Boulevard, Mail Station 115, Tallahassee, FL 32399-3000, grantee,

(Wherever used herein the terms "grantor" and "grantee" include all the parties to
this instrument and their heirs, legal representatives, successors and assigns.
"Grantor" and "grantee" are used for singular and plural, as the context requires
and the use of any gender shall include all genders.)

WITNESSETH: That the said grantor, for and in consideration of the sum of Ten Dollars and other good and valuable
considerations, to said grantor in hand paid by said grantee, the receipt whereof is hereby acknowledged, has granted, bargained and
sold to the said grantee, and grantee's successors and assigns forever, the following described land situate, lying and being in
OSCEOLA County, Florida, to-wit:

See Exhibit "A" attached hereto and by reference made a part hereof.

Property Appraiser's Parcel Identification Number: 36-28-33-0000-0030-0000

This conveyance is subject to easements, restrictions, limitations and conditions of record if any now exist, but any such
interests that may have been terminated are not hereby re-imposed.

This property is not the homestead property of the grantor, nor contiguous to homestead property, as such homestead
is defined under Florida law.

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

IN WITNESS WHEREOF the grantor has hereunto set grantor's hand and seal, the day and year first above written.

Signed, sealed and delivered in
the presence of:

Carlos V. Campos
(Signature of first Witness)

Carlos V. Campos
(Printed, typed or stamped name of
first Witness)

David D. Riech
(Signature of second Witness)

David D. Riech
(Printed, typed or stamped name of
second Witness)

Carlos V. Campos
(Signature of first Witness)

Carlos V. Campos
(Printed, typed or stamped name of
first Witness)

David D. Riech
(Signature of second Witness)

David D. Riech
(Printed, typed or stamped name of
second Witness)

CARLOS V. CAMPOS
1711 N. E. 142nd St.
Miami, FL 33183

CAROLISA HAVILAND
3188 1st Ave.
Vero Beach, FL 32966

STATE OF FLORIDA
COUNTY OF Dade

The foregoing instrument was acknowledged before me this 16th day of April, 2001, by CARLOS V. CAMPOS AND CAROLISA HAYTLAND. Such person(s) (Notary Public must check applicable box):

1 is personally known to me,
produced a current driver license,
produced _____ as identification.

Alyssa Larson
Notary Public
Alyssa Larson
(Printed, Typed or Stamped Name of Notary Public)
Commission No. CC892242
My Commission Expires 12/27/03



ATTESTED AS TO FORM AND LEGALITY

By _____
DEPARTMENT
DATE _____

EXHIBIT "A"

The South ½ of the North ½ of Section 36, Township 28 South, Range 33 East, Osceola County, Florida. Together with an easement for ingress and egress over the South ½ of said Section 36. Together, with a non-exclusive 50 foot easement for ingress, egress and utility purposes over the South 50 feet of Sections 33, 34 and 35, Township 28 South, Range 33 East. Said easement beginning at Highway 441 and continuing East to the Southwest corner of said Section 36.

Osceola Pine Savannas/ Campos
Osceola County

Page 1 of 1

REVISED
ESM APPROVED
By Mike Dole Date 1/1/00

Page 6 of 6
Amendment 3 to Lease No. 4226

12.3 SJRWMD Lease Agreement # 92094

LEASE AGREEMENT
FOR
BULL CREEK WILDLIFE MANAGEMENT
AND RECREATION AREA

THIS LEASE AGREEMENT, made and entered into this 12th day of May, 1993, by and between ST. JOHNS RIVER WATER MANAGEMENT DISTRICT, a Water Management District organized under the provisions of Chapter 373, Florida Statutes, with its office in Palatka, Florida, whose post office address is P. O. Box 1429, hereinafter referred to as the DISTRICT; and the FLORIDA GAME AND FRESH WATER FISH COMMISSION of the State of Florida, with its primary office in Tallahassee, Florida, whose address is 620 South Meridian Street, hereinafter referred to as the COMMISSION:

W I T N E S S E T H

WHEREAS, DISTRICT owns certain lands located in the Upper St. Johns River Basin for water management purposes; and

WHEREAS, it has been determined that additional public benefits from these lands can be derived from the management of such lands for public outdoor recreational purposes, including but not limited to hunting, fishing, hiking, horseback riding, bird watching and nature study, pursuant to Section 373.139(4), Florida Statutes, as long as these uses are consistent with the water management purposes of the DISTRICT as provided in Chapter 373, Florida Statutes, and that all uses for public recreation are subordinate to DISTRICT responsibility under Section 373, F.S. to manage the water resources; and

WHEREAS, District-owned lands as described hereinafter serve a vital function to the Upper St. Johns River Basin by providing water storage for flood and low flow periods, assimilation of pollution and diverse wetland habitat for maintenance of wildlife populations; and

WHEREAS, management of these lands for outdoor recreational purposes may properly be served by their operation as a Type I Wildlife Management and Recreational Area under the jurisdiction of the COMMISSION.

PAGE 1 OF 8

NOW THEREFORE, the parties hereto, for and in consideration of the sum of One Dollar (1.00), cash in hand paid by each to the other, and the mutual covenants and agreements hereinafter contained, and in the interest of the public served by both parties hereto, the DISTRICT and COMMISSION do hereby covenant and agree as follows:

1. The DISTRICT does hereby, upon and subject to the terms, conditions, and limitations hereinafter contained, give, transfer and lease to the COMMISSION a Type I Wildlife Management and Recreational Area Lease for those lands described in Appendix A. Therefore, the COMMISSION is granted subject to the maintenance of the hydrologic regime, the exclusive right to provide for public recreational use of these lands including:
 - (A) the right to establish bag limits which limit the taking of legal game and fish in reasonable quantities consistent with habitat maintenance, and preservation of wildlife and fish populations;
 - (B) the management of the lands and the creation of facilities as needed to support public recreational use of the area such as hunting, fishing, hiking, horseback riding, camping, and archeological studies;
 - (C) access by COMMISSION agents and employees as necessary for such management of public recreational uses;
 - (D) the right to conduct all public recreational uses compatible with the DISTRICT'S primary water management function, the DISTRICT'S property covenants, and limitations on development requiring these lands to be managed and maintained in an environmentally acceptable manner, so as to restore and protect its natural state and condition. Natural condition shall be interpreted to mean that only those minimum structure alterations to terrain, and impervious areas essential to public access and recreational use of these lands shall be constructed. DISTRICT approval shall be obtained for any construction beyond routine maintenance of existing improvements.

PAGE 2 OF 8

2. The DISTRICT hereby specifically reserves for its own use and exempts from this lease agreement:
 - (A) All other uses of the property.
 - (B) Specifically, all water management uses including periodic inundation, construction of works and appurtenant works, access roads and supporting structures. Water management uses shall take priority over all other uses including those general public recreational uses herein granted to the COMMISSION.
 - (C) All uses not compatible with water management uses or with DISTRICT property covenants or limitations requiring the land to be managed and maintained in an environmentally acceptable manner, so as to restore and protect their natural state and condition.
3. The DISTRICT or the COMMISSION shall have the right to unilaterally terminate this lease. Either party may terminate this Agreement upon (60) days written notice to the other party. However, if such notice is given after March 1 of any calendar year, the date of termination shall be the first February 15 following the date of said notice.
4. The initial term of this Lease shall be for a period of five (5) years from the effective date of this Agreement; thereafter, the Lease shall continue, automatically, in five (5) year increments, subject to termination as set forth herein.
5. District policy is to own and manage only those lands necessary for conduct of its water management responsibilities. As these responsibilities change due to project redesign, planning changes, or other reasons the District may need to acquire additional lands through property exchange or to dispose of part or all of its existing ownership included under this lease. The District therefore reserves the right to terminate this lease at any time with advance notice of 45 days in order to release, exchange or convey to others these lands.
6. Specific COMMISSION responsibilities undertaken as terms of this agreement are:
 - (A) To provide insofar as funds are available all suitable public recreational opportunities on each major parcel described in this

PAGE 3 OF 8

lease for which a public demand is known. The DISTRICT shall have the final decision regarding resolution of conflicts between different recreational activities on its lands covered by this lease.

- (B) To manage and maintain the lands and any facilities supporting general public recreational use in an environmentally acceptable manner and in accordance with good management practices. These duties include:
 - (i) Assisting with fire protection through maintenance of interior fire lines
 - (ii) Enforcement of applicable laws
 - (iii) Posting of boundaries
 - (iv) Structure repair
 - (v) Assisting with livestock removal
 - (vi) Public information on recreation
 - (vii) Access road and recreational trails development and maintenance
 - (viii) Maintenance of natural conditions
 - (ix) Periodic inspection and surveillance of lands
 - (x) Necessary assistance to recreational users
 - (C) To seek federal and state funds for construction and maintenance of public recreational facilities on those lands and management of lands.
 - (D) To establish an acceptable system of user fee collection for construction and maintenance of public recreational facilities for these lands and management of these lands. Any implementation of a user fees system for access specifically on DISTRICT lands shall be approved by the DISTRICT prior to use.
7. Specific DISTRICT responsibilities undertaken as terms of this agreement are:

PAGE 4 OF 8

- (A) The operation of all water management facilities and structures so as not to unnecessarily interfere with recreational uses.
 - (B) Provide District Land Manager to provide assistance as necessary to COMMISSION personnel and public recreational users and shall serve as the primary DISTRICT contact and agent for the property.
 - (C) Maintain firelines protecting the perimeter and improvements, and annually maintain five (5) miles of logistic firelines east of Bull Creek.
 - (D) Provide funds to supplement COMMISSION's budget for the repair and upgrade of public access roads insofar as funds are available.
8. The COMMISSION shall submit interim quarterly reports and an annual summary report by major land parcel to the DISTRICT on:
 - (A) Public use figures
 - (B) COMMISSION maintenance activities
 - (C) Problem areas
 - (D) Law enforcement summary
 - (E) Status of land and wildlife conditions
 - (F) Policies, activities and procedures established for the current year and changes proposed for the following year are to be provided in the annual report (due January 15).
 9. The COMMISSION shall submit to the DISTRICT an annual work plan.
 10. Proposed deviations in authorized recreational use or in regulations governing such use shall be approved by the DISTRICT and COMMISSION. Comments received on proposed changes and current use shall be considered by the DISTRICT and COMMISSION for the succeeding year. The invitation for comment shall be provided by the COMMISSION.
 11. The COMMISSION agrees to utilize its best efforts to obtain federal and state funds for maintenance of the property including roads, fences, and preventive fire techniques including the development of fire lanes and controlled burning consistent with the DISTRICT'S Fire Management Plan.
 12. The DISTRICT shall have authority to prohibit access and entrance onto said lands, upon notice to the COMMISSION forty-eight hours prior to

PAGE 5 OF 8

- such prohibition, during periods of potential drought, flooding, fire hazard or other harm or disaster to said lands, as determined by the DISTRICT.
13. Because land management activities such as forest management, water management and prescribed burning have great impact on wildlife habitat and populations, such activities shall be coordinated and/or conducted mutually by the Division of Forestry, the DISTRICT, the COMMISSION and any other state agency that might be appropriate.
 14. The COMMISSION shall neither transfer, nor assign, this lease Agreement, nor sublet the leased premises or any part thereof, nor grant any interest, privileges or license whatsoever in connection with this lease (except for hunting, fishing and access licenses).
 15. It is clearly understood that nothing under the terms of the Agreement or any usage of the DISTRICT'S lands and waters contemplated by this Agreement will render the DISTRICT liable for property or personal damages resulting from any usage of this area by personnel of the COMMISSION or by persons authorized by the DISTRICT or COMMISSION to enter this area. Further, the COMMISSION agrees to indemnify and hold harmless the DISTRICT for any injury or damages in consequence of the activities on the lands described in Appendix A, including reasonable attorney fees arising out of this agreement to the extent allowed by Section 768.28, Florida Statutes. Nothing above shall constitute a waiver of sovereign immunity enjoyed by any agency of the state which may become a party signatory hereto as provided by Section 768.28, Florida Statutes.
 16. The COMMISSION assures and certifies that it will comply with Title IV of the Civil Rights Act of 1964 (P. L. 88-352) and in accordance with that Act, no person in the United States shall, on the grounds of race, creed, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under the Wildlife Management and Recreation Area Program and will immediately take any measures necessary to effectuate this Agreement.
 17. There is no conflict of interest or any other prohibited relationship between the DISTRICT and the COMMISSION.

PAGE 6 OF 8

18. The public purpose served by the lease is to provide public outdoor recreation.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, this 12th day of May, 1993.

ST. JOHNS RIVER WATER
MANAGEMENT DISTRICT

By Joe E. Hill
JOE E. HILL, Chairman
Per Lenore

ATTEST:

(AFFIX SEAL)

Lenore N. McCullagh
LENORE N. McCULLAGH, Secretary
Per Lenore

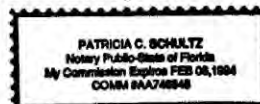
STATE OF FLORIDA
COUNTY OF PUTNAM

PERSONALLY APPEARED, before me the undersigned authority, Joe E. Hill and Lenore N. McCullagh, personally known to me and known to be the Chairman and Secretary, respectively, of the Governing Board of the ST. JOHNS RIVER WATER MANAGEMENT DISTRICT, and acknowledged before me that they executed the foregoing document on behalf of the Governing Board of the ST. JOHNS RIVER WATER MANAGEMENT DISTRICT, as its true act and deed and that they were authorized so to do and they did not take an oath.

WITNESS my hand and official seal in the State and County last aforesaid this 12th day of May, 1993.

(NOTARIAL SEAL)

Patricia C. Schultz
NOTARY PUBLIC
Print Name: Patricia C. Schultz
My Commission Expires:



APPROVED AS TO FORM AND LEGALITY:

John W. Williams
JOHN W. WILLIAMS, S.J.R.W.M.D.
Sr. Assistant General Counsel
Office of General Counsel

Signed, sealed and delivered
in the presence of:

Gale F. Cook
Print Name: Gale F. Cook

Susan Wilkes
Print Name: Susan Wilkes

FLORIDA GAME AND FRESH WATER
FISH COMMISSION

By Robert M. Brantly
COL. ROBERT M. BRANTLY
Executive Director

(AFFIX SEAL)

STATE OF FLORIDA
COUNTY OF LEON

PERSONALLY APPEARED, before me the undersigned authority, Colonel Robert M. Brantly, personally known to me to be the Executive Director of the STATE OF FLORIDA GAME AND FRESH WATER FISH COMMISSION, and acknowledged before me that he executed the foregoing document on behalf of the STATE OF FLORIDA GAME AND FRESH WATER FISH COMMISSION, as its true act and deed and that he was authorized so to do and he did not take an oath.

WITNESS my hand and official seal in the State and County last aforesaid this 13th day of April, 1993.

(NOTARIAL SEAL)

Jimmie C. Bevis
NOTARY PUBLIC
Print Name: JIMMIE C. BEVIS
My Commission Expires:

Notary Public, State of Florida
My Commission Expires Nov. 7, 1993
Bonded Thru Tracy Fols - Insurance Inc.

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

[Signature]
Commission Attorney

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APPENDIX "A"
LEGAL DESCRIPTION

All of Sections 30, 31 and 32, Township 27 South, Range 34 East, and all of Sections 4, 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33 and 34, Township 28 South, Range 34 East, of the "LAND OF GEORGE W. HOPKINS" according to the plat thereof, as recorded in Plat Book 1, page 123, Osceola County, Florida, public records.

Also, all that part of Sections 19, 20, 28, 29, 33 and 34, Township 27 South, Range 34 East, and all that part of Sections 3, 10, 14, 15, 23, 26 and 35, Township 28 South, Range 34 East of said "LAND OF GEORGE W. HOPKINS", lying Southerly of the right-of-way for U. S. Highway No. 192 (State Road No. 500) and Westerly of the following specifically described line:

From a 5" x 5" concrete monument marking the Southwest (SW) corner of said Section 35, Township 28 South, Range 34 East bear North 89°55'27" East, along the South line of said Section 35, a distance of 2271.60 feet to the POINT OF BEGINNING;

Thence, due North, a distance of 3600.56 feet;
Thence, North 9°07'00" West, a distance of 19,458.16 feet;
Thence, North 45°52'00" West, a distance of 1804.87 feet;
Thence, North 0°44'06" West, a distance of 2650.49 feet;
Thence, North 24°14'00" West, a distance of 7168.72 feet;
Thence, North 32°28'00" West, a distance of 12,188.04 feet to the intersection thereof with the South right-of-way line of said U. S. Highway No. 192 (State Road No. 500) and the end of the specifically described line.

Also, all that part of Sections 15, 21, 22, 23, 24, 25, 26, 27, 28, 29 and 34, Township 27 South, Range 33 East, being specifically described as follows:

Begin at an Osceola County concrete monument marking the Northeast (NE) corner of said Section 25;
thence, bear South 0°03'38" West, along the East line of said Section 25, a distance of 767.74 feet to a 5" x 5" concrete monument marking the Northwest (NW) corner of Section 30, Township 27 South, Range 34 East, according to the plat of "LANDS OF GEORGE W. HOPKINS", as recorded in Plat Book 1, page 123, Osceola County, Florida, public records;

Thence, South 0°13'44" East, continuing along the East line of said Section 25, a distance of 1588.77 feet;
Thence, North 34°17'07" West, a distance of 474.39 feet;
Thence, North 74°44'42" West, a distance of 114.02 feet;
Thence, South 61°30'16" West, a distance of 199.12 feet;
Thence, North 78°41'24" West, a distance of 127.48 feet;
Thence, North 48°00'46" West, a distance of 134.54 feet;
Thence, North 11°55'46" West, a distance of 362.84 feet;
Thence, North 73°53'55" West, a distance of 504.80 feet;
Thence, South 80°03'03" West, a distance of 501.39 feet;
Thence, South 72°36'24" West, a distance of 713.79 feet;
Thence, South 60°48'09" West, a distance of 194.74 feet;
Thence, South 45°00'00" West, a distance of 233.35 feet;
Thence, South 22°18'22" West, a distance of 421.54 feet;
Thence, North 22°57'30" West, a distance of 363.57 feet;
Thence, North 38°39'35" West, a distance of 333.26 feet;
Thence, North 45°44'39" West, a distance of 272.26 feet;
Thence, North 56°37'20" West, a distance of 508.94 feet;
Thence, North 77°16'32" West, a distance of 317.80 feet;
Thence, North 87°08'15" West, a distance of 400.50 feet;

Thence, South 68°35'13" West, a distance of 273.91 feet;
 Thence, South 76°08'20" West, a distance of 396.55 feet;
 Thence, North 62°58'40" West, a distance of 520.26 feet
 to a point on the West line of said Section 25; said point
 bears South 0°09'29" East, a distance of 1162.74 feet from
 a 5" x 5" concrete monument marking the Northwest (NW)
 corner of said Section 25;
 Thence, North 77°22'50" West, a distance of 314.12 feet;
 Thence, South 74°24'26" West, a distance of 446.43 feet;
 Thence, South 49°30'50" West, a distance of 269.54 feet;
 Thence, South 35°08'03" West, a distance of 495.23 feet;
 Thence, South 15°49'57" West, a distance of 348.21 feet;
 Thence, North 84°17'22" West, a distance of 100.50 feet;
 Thence, North 32°11'45" West, a distance of 319.06 feet;
 Thence, North 7°07'30" West, a distance of 282.18 feet;
 Thence, North 20°26'58" East, a distance of 314.84 feet;
 Thence, North 38°39'35" West, a distance of 256.12 feet;
 Thence, North 54°46'57" West, a distance of 208.09 feet;
 Thence, North 82°52'30" West, a distance of 241.87 feet;
 Thence, South 55°10'32" West, a distance of 280.18 feet;
 Thence, South 38°39'35" West, a distance of 576.28 feet;
 Thence, South 22°37'12" West, a distance of 260.00 feet;
 Thence, South 50°02'33" West, a distance of 241.35 feet;
 Thence, South 68°29'55" West, a distance of 177.34 feet;
 Thence, South 30°34'45" West, a distance of 255.54 feet;
 Thence, South 78°20'59" West, a distance of 495.20 feet;
 Thence, North 79°22'49" West, a distance of 244.18 feet;
 Thence, South 70°20'46" West, a distance of 297.32 feet;
 Thence, South 52°21'09" West, a distance of 1105.10 feet;
 Thence, South 38°54'15" West, a distance of 254.12 feet to a
 point on the East line of said Section 27; said point bears
 North 0°01'50" East, a distance of 2081.39 feet from a
 5" x 5" Osceola County concrete monument marking the Southeast
 (SE) corner of said Section 27;
 Thence, South 33°29'10" West, a distance of 254.49 feet;
 Thence, South 17°22'27" West, a distance of 853.96 feet;
 Thence, South 30°01'06" West, a distance of 259.86 feet;
 Thence, South 9°27'44" West, a distance of 273.72 feet;
 Thence, South 37°52'30" East, a distance of 342.05 feet;
 Thence, South 17°12'35" East, a distance of 302.85 feet to
 a point on the South line of said Section 27; said point bears
 South 89°58'02" West, a distance of 283.56 feet from the
 Southeast (SE) corner of said Section 27;
 Thence, South 20°12'03" West, a distance of 288.45 feet;
 Thence, South 87°42'34" West, a distance of 125.10 feet;
 Thence, North 46°29'07" West, a distance of 399.99 feet to a
 point on the South line of said Section 27; said point bears
 South 89°58'02" West, a distance of 798.24 feet from the
 Southeast (SE) corner of said Section 27;
 Thence, North 3°55'15" West, a distance of 510.78 feet;
 Thence, North 24°12'04" West, a distance of 487.88 feet;
 Thence, North 1°21'50" East, a distance of 420.12 feet;
 Thence, North 21°22'14" East, a distance of 493.96 feet;
 Thence, North 12°58'31" East, a distance of 1113.43 feet;
 Thence, North 14°33'37" West, a distance of 397.78 feet;
 Thence, North 57°25'33" West, a distance of 427.20 feet;
 Thence, North 41°15'03" West, a distance of 1243.63 feet;
 Thence, North 48°17'21" West, a distance of 616.20 feet;
 Thence, North 66°02'15" West, a distance of 492.44 feet;
 Thence, North 81°15'14" West, a distance of 526.12 feet;
 Thence, North 87°17'58" West, a distance of 530.59 feet;
 Thence, South 76°19'43" West, a distance of 571.18 feet;
 Thence, South 7°18'21" West, a distance of 196.60 feet;
 Thence, South 24°46'31" East, a distance of 143.18 feet;
 Thence, South 26°33'54" West, a distance of 67.08 feet;
 Thence, North 62°44'41" West, a distance of 185.61 feet;
 Thence, North 50°23'22" West, a distance of 188.22 feet;
 Thence, South 84°33'35" West, a distance of 421.90 feet;
 Thence, North 23°22'58" West, a distance of 515.83 feet to
 a 5" x 5" Osceola County concrete monument marking the Southeast
 (SE) corner of said Section 21;

Thence, North 40°51'50" West, a distance of 894.56 feet;
 Thence, South 51°50'34" West, a distance of 267.07 feet;
 Thence, South 75°33'21" West, a distance of 340.77 feet;
 Thence, South 88°34'04" West, a distance of 400.12 feet;
 Thence, North 67°33'26" West, a distance of 248.85 feet;
 Thence, Due West, a distance of 180.00 feet;
 Thence, South 65°19'23" West, a distance of 203.59 feet;
 Thence, South 51°40'48" West, a distance of 655.28 feet to a
 point on the South line of said Section 21; said point bears
 South 89°34'06" East; a distance of 31.04 feet from a 5" x 5"
 concrete monument marking the Southwest (SW) corner of the
 Southeast one-quarter (SE $\frac{1}{4}$) of said Section 21;
 Thence, South 48°51'59" West, a distance of 1175.58 feet;
 Thence, South 64°26'24" West, a distance of 382.43 feet;
 Thence, South 84°42'36" West, a distance of 271.15 feet;
 Thence, South 59°58'54" West, a distance of 259.86 feet;
 Thence, South 50°49'35" West, a distance of 348.28 feet;
 Thence, South 30°27'56" West, a distance of 197.23 feet;
 Thence, South 12°02'44" West, a distance of 1221.90 feet;
 Thence, South 29°20'25" West, a distance of 678.29 feet to a
 point on the West line of said Section 28; said point bears
 South 0°15'04" East, a distance of 3290.02 feet from a
 5" x 5" Osceola County concrete monument marking the
 Northwest (NW) corner of said Section 28;
 Thence, South 14°22'22" West, a distance of 695.49 feet;
 Thence, South 45°12'36" West, a distance of 965.21 feet;
 Thence, South 34°59'31" West, a distance of 244.13 feet;
 Thence, South 28°28'27" West, a distance of 335.60 feet;
 Thence, South 68°37'46" West, a distance of 370.47 feet;
 Thence, North 58°36'35" West, a distance of 345.58 feet;
 Thence, North 43°40'04" West, a distance of 304.14 feet;
 Thence, North 9°43'39" East, a distance of 177.55 feet;
 Thence, North 59°10'20" East, a distance of 361.00 feet;
 Thence, North 30°32'51" East, a distance of 354.15 feet;
 Thence, North 54°54'15" East, a distance of 226.11 feet;
 Thence, North 14°49'35" East, a distance of 175.86 feet;
 Thence, North 40°39'24" West, a distance of 560.22 feet;
 Thence, North 50°26'25" West, a distance of 1342.48 feet;
 Thence, South 71°38'28" East, a distance of 1190.60 feet;
 Thence, South 46°07'24" East, a distance of 360.69 feet;
 Thence, South 16°15'37" East, a distance of 375.00 feet;
 Thence, South 32°47'58" East, a distance of 267.68 feet;
 Thence, Due East, a distance of 55.00 feet;
 Thence, North 25°49'16" East, a distance of 172.19 feet;
 Thence, North 11°28'55" East, a distance of 326.53 feet;
 Thence, North 20°11'09" East, a distance of 724.50 feet;
 Thence, North 6°42'35" East, a distance of 342.34 feet;
 Thence, North 44°32'56" East, a distance of 449.03 feet;
 Thence, North 18°10'41" East, a distance of 352.60 feet;
 Thence, North 29°13'09" West, a distance of 338.01 feet;
 Thence, North 11°18'36" East, a distance of 305.94 feet;
 Thence, North 49°41'34" East, a distance of 265.22 feet to a
 point on the West line of said Section 28; said point bears
 South 0°15'04" East a distance of 922.15 feet from the
 Northwest (NW) corner of said Section 28;
 Thence, North 49°41'34" East, a distance of 685.49 feet;
 Thence, North 29°44'42" East, a distance of 362.80 feet;
 Thence, North 86°13'18" East, a distance of 531.15 feet;
 Thence, North 4°14'11" East, a distance of 119.62 feet to a
 point on the North line of said Section 28; said point bears
 South 89°34'00" East, a distance of 1245.67 feet from the
 Northwest (NW) corner of said Section 28;
 Thence, North 13°46'42" West, a distance of 289.03 feet;
 Thence, South 50°11'40" East, a distance of 234.21 feet;
 Thence, North 81°34'23" East, a distance of 136.47 feet;
 Thence, North 31°54'29" East, a distance of 312.17 feet;

Thence, North 17°21'14" East, a distance of 251.45 feet;
 Thence, North 41°59'14" East, a distance of 134.54 feet;
 Thence, North 76°11'06" East, a distance of 314.09 feet;
 Thence, North 67°37'12" East, a distance of 551.54 feet;
 Thence, North 50°47'34" East, a distance of 490.41 feet;
 Thence, North 9°57'50" East, a distance of 375.67 feet;
 Thence, North 70°20'46" East, a distance of 222.99 feet;
 Thence, South 85°14'11" East, a distance of 481.66 feet;
 Thence, North 85°51'55" East, a distance of 226.64 feet;
 Thence, North 74°48'45" East, a distance of 491.10 feet;
 Thence, North 59°15'00" East, a distance of 459.62 feet;
 Thence, North 84°12'26" East, a distance of 346.77 feet;
 Thence, South 66°06'04" East, a distance of 129.02 feet to a point on the West line of said Section 22; said point bears South 0°02'29" East, a distance of 516.09 feet from a 5" x 5" Osceola County concrete monument marking the Northwest (NW) corner of the Southwest one-quarter (SW¼) of said Section 22;
 Thence, South 66°06'04" East, a distance of 784.28 feet;
 Thence, South 73°51'23" East, a distance of 637.12 feet;
 Thence, South 80°20'25" East, a distance of 195.78 feet;
 Thence, South 53°28'16" East, a distance of 336.01 feet;
 Thence, North 74°14'56" East, a distance of 202.61 feet;
 Thence, North 51°57'11" East, a distance of 292.06 feet;
 Thence, North 46°35'28" East, a distance of 254.66 feet;
 Thence, North 74°34'40" East, a distance of 300.83 feet;
 Thence, North 18°26'06" East, a distance of 142.30 feet;
 Thence, North 21°48'05" West, a distance of 161.55 feet;
 Thence, North 15°33'16" West, a distance of 503.44 feet;
 Thence, North 21°09'06" West, a distance of 900.68 feet;
 Thence, North 37°18'14" East, a distance of 660.02 feet;
 Thence, North 7°12'51" West, a distance of 398.15 feet;
 Thence, North 35°25'01" West, a distance of 552.18 feet;
 Thence, North 46°04'51" West, a distance of 626.54 feet to a point on the North line of said Section 22; said point bears South 89°50'49" East, a distance of 1796.15 feet from a 5" x 5" concrete monument marking the Northwest (NW) corner of said Section 22;
 Thence, North 46°04'51" West, a distance of 336.32 feet to the intersection thereof with the South right-of-way line of State Road No. 500 (also known as U. S. 192);
 Thence, South 81°19'57" East, along said right-of-way line, a distance of 1571.25 feet to a point on the North line of said Section 22; said point bears South 89°50'49" East, a distance of 3107.20 feet from the Northwest (NW) corner of said Section 22;
 Thence, continue South 81°19'57" East, along said right-of-way line, a distance of 1235.93 feet;
 Thence, South 16°41'57" East, a distance of 1038.64 feet;
 Thence, South 27°28'28" East, a distance of 563.56 feet;
 Thence, South 61°33'25" East, a distance of 491.63 feet to a point on the East line of said Section 22;
 Thence, South 0°06'04" West, along said East line, a distance of 732.07 feet to a 5" x 5" Osceola County concrete monument marking the Southeast (SE) corner of the Northeast one-quarter (NE¼) of said Section 22;
 Thence, South 0°07'00" West, continuing along said East line, a distance of 542.61 feet;
 Thence, South 67°48'16" East, a distance of 691.34 feet;
 Thence, South 78°25'29" East, a distance of 423.62 feet;
 Thence, North 63°41'35" East, a distance of 496.41 feet;
 Thence, North 88°24'32" East, a distance of 720.28 feet;
 Thence, South 61°08'40" East, a distance of 279.73 feet;
 Thence, North 73°18'03" East, a distance of 261.01 feet;
 Thence, North 27°33'10" East, a distance of 518.84 feet;
 Thence, North 36°23'04" East, a distance of 354.01 feet;
 Thence, North 15°08'28" West, a distance of 440.28 feet;

Thence, North 2°48'56" East, a distance of 305.37 feet;
 Thence, South 81°52'12" East, a distance of 106.07 feet;
 Thence, South 2°36'09" West, a distance of 330.34 feet;
 Thence, South 22°26'34" East, a distance of 248.85 feet;
 Thence, South 44°22'13" East, a distance of 643.51 feet;
 Thence, South 37°57'15" East, a distance of 317.06 feet;
 Thence, South 70°06'53" East, a distance of 499.80 feet;
 Thence, South 28°10'43" East, a distance of 476.47 feet;
 Thence, South 80°40'32" East, a distance of 709.33 feet to the
 intersection thereof with the West line of said Section 24;
 Thence, South 0°15'55" West, along said West line, a distance
 of 1430.98 feet to a 5" x 5" concrete monument marking the
 Southwest (SW) corner of said Section 24;
 Thence, North 89°54'32" East, along the South line of said
 Section 24, a distance of 2428.38 feet to the Southwest (SW)
 corner of Lot 18, Block C, Holopaw Country Estates, Section One
 Unit "A", according to the plat thereof, as recorded in Plat
 Book 1, page 351, Osceola County, Florida, public records;
 Thence, North 0°12'58" West, along the West line of said Lot 18,
 a distance of 808.22 feet to the Northwest (NW) corner of said
 Lot 18; Thence, North 89°45'33" East, along the North line of
 said Lot 18 and its Easterly extension, a distance of 660.07 feet;
 Thence, North 89°45'32" East, along the North line of Lot 18,
 Block B of said Holopaw Country Estates, and along the Westerly
 extension of said North line, a distance of 659.82 feet to the
 Northeast (NE) corner of said Lot 18, Block B;
 Thence, South 0°13'56" East, along the East line of said Lot 18,
 Block B, a distance of 811.25 feet to the Southeast (SE) corner
 of said Lot 18, Block B;
 Thence, North 89°53'12" East, along the South line of said
 Holopaw Country Estates, a distance of 659.88 feet to the
 Southwest (SW) corner of Lot 24, Block A of said Holopaw Country
 Estates;
 Thence, North 0°14'31" West, along the West line of said Lot 24,
 a distance of 812.34 feet to the Northwest (NW) corner of said
 Lot 24; Thence, North 89°47'31" East, along the North line of
 said Lot 24 and its Easterly extension, a distance of 719.76
 feet to the intersection thereof with the West line of Lot 12,
 Block A of said Holopaw Country Estates;
 Thence, North 0°15'05" West, along the West line of said Lot 12,
 a distance of 60.00 feet to the Northwest (NW) corner of said
 Lot 12; Thence, North 89°47'31" East, along the North line of
 said Lot 12, a distance of 660.00 feet to the Northeast (NE)
 corner of said Lot 12; Thence, South 0°15'27" East, along the
 East line of said Lot 12, a distance of 874.61 feet to the
POINT OF BEGINNING.

The above described parcels of land contain 22,206 acres.

The Bearings refer to the standard plane rectangular coordinate system for the East Zone of Florida.

12.4 Definitions of Management Plan Terms

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.

12.5 Public Hearing Notice, Advertisements, and Press Release

12.5.1 Public Hearing Notice

NOTICE

The Florida Fish and Wildlife Conservation Commission (FWC)
Announces a

PUBLIC HEARING for the **Herky Huffman/Bull Creek Wildlife Management Area Management Plan**

Osceola County, Florida

7:00 P.M. Thursday, September 20th, 2018

Osceola Board of County Commissioner Chambers

1 Courthouse Square #4700

Kissimmee, FL 34741

PURPOSE: To receive public comment regarding considerations for the FWC ten-year Land Management Plan for the Herky Huffman/Bull Creek Wildlife Management Area (HHBCWMA). This hearing is being held **EXCLUSIVELY** for discussion of the **DRAFT Herky Huffman/Bull Creek Wildlife Management Area Management Plan**. This meeting is not being held to discuss area hunting or fishing regulations. For more information on the process for FWC rule and regulation development go online to:

<http://myfwc.com/about/rules-regulations/>

or call (850) 487-7063.

A Management Prospectus for the Herky Huffman/Bull Creek Wildlife Management Area is available upon request. For a copy, please contact Dylan Imlah, Florida Fish and Wildlife Conservation Commission, Land Conservation and Planning, 620 South Meridian Street, Tallahassee, Florida 32399-1600. Telephone: (850) 487-9102.

12.5.2 Internal FWC Press Release



(Having trouble viewing this email? [View it as a Web page.](#))

Media contacts: Diane Hirth, 850-251-2130; Greg Workman, 352-620-7335

Photos available on the FWC's Flickr site: <https://flic.kr/s/aHskaJ3M7T>

Suggested Tweet: Help plan the future of Herky Huffman/Bull Creek #Wildlife Management Area at Sept. 20 public hearing. @MyFWC:
<https://content.govdelivery.com/accounts/FLFFWCC/bulletins/20cb754>
#Florida

Help plan the future of Herky Huffman/Bull Creek Wildlife Management Area



FWC PHOTO.

A 10-year plan for the [Herky Huffman/Bull Creek Wildlife Management Area](#) will be presented at a public hearing in Osceola County on Thursday, Sept. 20. People are

Florida Fish and Wildlife Conservation Commission | Herky Huffman/Bull Creek Wildlife
Management Area Management Plan

invited to the 7 p.m. public hearing at the Osceola Board of County Commissioners Chambers, 1 Courthouse Square #4700, Kissimmee.

Florida Fish and Wildlife Conservation Commission (FWC) staff will present the draft land management plan for the FWC-managed Herky Huffman/Bull Creek WMA, and people will be encouraged to comment and ask questions. For more information on the [upcoming local public hearing](#), go to MyFWC.com/Conservation and select “Terrestrial,” “Management Plans” and “Upcoming Local Public Hearings.”

The Herky Huffman/Bull Creek WMA is in southern Osceola County, adjacent to the [Triple N Ranch WMA](#) and Three Forks Marsh Conservation Area. This WMA provides many opportunities for outdoor recreation, including hunting, fishing, wildlife viewing, hiking, biking, horseback riding, paddling and camping.

Red-cockaded woodpeckers, eastern indigo snakes, gopher tortoises and American alligators are among the native wildlife living in its flatwoods and swamps.

This WMA’s floodplain encompasses the Crabgrass, Jane Green and Bull Creek systems, and conserves water resources that help prevent floods and enhance ecological functions. The area also contains an entire spectrum of relatively undisturbed plant communities occurring within the upper basin of the St. Johns River.

“Herky Huffman/Bull Creek WMA was purchased to ensure the conservation of fish and wildlife resources and other natural and cultural resources, and to offer public opportunities for outdoor recreation,” said Dylan Imlah, FWC land conservation planner. “This draft plan will specify how we intend to do that.”

All lands purchased with public funds must have a management plan that ensures the property will be managed in a manner that is consistent with the intended purposes of the purchase. Hunting and fishing regulations are not included in this plan or meeting; those are addressed through a separate public process.

To obtain a copy of the land management prospectus for Herky Huffman/Bull Creek WMA, call Dylan Imlah at 850-487-9102 or email Dylan.Imlah@MyFWC.com.

For more information and background on [management plans](#) and their goals, visit MyFWC.com/Conservation and select “Terrestrial” then “Management Plans.”

For more on the Herky Huffman/Bull Creek WMA, go to MyFWC.com and select “Wildlife Viewing” then “Wildlife Management Areas.”

-30-

12.5.3 Osceola News Gazette Ad

PROOF OF PUBLICATION

From



STATE OF FLORIDA COUNTY OF OSCEOLA

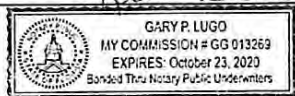
Before me, the undersigned authority,
personally appeared Keith Vorse,
who on oath says that he is the
Legal Clerk of the Osceola News-Gazette,
a twice-weekly newspaper published
at Kissimmee, in Osceola County, Florida;
that the attached copy of the advertisement
was published in the regular and entire
edition of said newspaper in
the following issues:

September 6, 2018

Affiant further says that the
Osceola News-Gazette is a newspaper
published in Kissimmee, in said
Osceola County, Florida, and that the said
newspaper has heretofore been
continuously published in said
Osceola County, Florida, each week
and has been entered as periodicals
postage matter at the post office
in Kissimmee, in said Osceola County, Florida,
for a period of one year preceding
the first publication of the attached copy of
advertisement; and affiant further says that
he has neither paid nor promised
any person, firm or corporation any discount,
rebate, commission or refund for the
purpose of securing this advertisement for
publication in the said newspaper.

Sworn and subscribed before
me by Keith Vorse, who is
personally known to me, this

6th day of September, 2018



Gary P. Lugo

IN THE MATTER OF: NOTICE OF PUBLIC MEETING

FIRST PUBLICATION: Sept 6, 2018

LAST PUBLICATION: Sept. 6, 2018

NOTICE OF PUBLIC HEARING

The Florida Fish and Wildlife Conservation Commission (FWC) announces a PUBLIC HEARING for the FWC Lead Managed Portions of Herky Huffman/Bull Creek Wildlife Management Area located in Osceola County, Florida.

7:00 P.M. Thursday, September 20, 2018
Osceola Board of County Commissioner Chambers
1st Court House Square, # 4700
Kissimmee, FL 34741

PURPOSE: To receive public comment regarding considerations for FWC's ten-year Management Plan for the FWC Lead Managed Portions of Herky Huffman/Bull Creek Wildlife Management Area (HHBCWMA).

This hearing is being held EXCLUSIVELY for discussion of the DRAFT Herky Huffman/Bull Creek WMA Management Plan. This meeting is not being held to discuss area hunting or fishing regulations. For more information on the process for FWC rule and regulation development visit www.myfwc.com/about/rules-regulations/changes/

A Management Prospectus for Herky Huffman/Bull Creek WMA and copy of the agenda is available upon request from the Florida Fish and Wildlife Conservation Commission, Land Conservation and Planning Group, 620 South Meridian Street, Tallahassee, Florida 32310-1600. Telephone: (904) 487-9102 or by e-mail at Dylan.Liman@myfwc.com
September 6, 2018



Make remittance to: Osceola News-Gazette, 108 Church Street,
Kissimmee, FL 34741

Phone: (407) 846-7600 Fax: (321) 402-2946

Email: legalads@osceolanewsgazette.com

You can also view your Legal Advertising on

www.AroundOsceola.com or www.FloridaPublicNotices.com

12.5.4 Florida Administrative Register Ad

ID 20849488

Notice of Meeting/Workshop Hearing

FISH AND WILDLIFE CONSERVATION COMMISSION

Freshwater Fish and Wildlife

The Fish and Wildlife Conservation Commission announces a public meeting to which all persons are invited.

DATE AND TIME: Thursday, September 20, 2018, 7:00 p.m.

PLACE: Osceola Board of County Commissioner Chambers, 1st Court House Square #4700, Kissimmee, FL 34741

GENERAL SUBJECT MATTER TO BE CONSIDERED: To receive public comment regarding considerations for FWC's ten-year Management Plan for the FWC Lead Managed Portions of Herky Huffman/Bull Creek Wildlife Management Area (HHBCWMA).

This hearing is being held EXCLUSIVELY for discussion of the DRAFT Herky Huffman/Bull Creek WMA Management Plan. This meeting is not being held to discuss area hunting or fishing regulations. For more information on the process for FWC rule and regulation development visit our Proposed Rule Changes page.

A copy of the agenda may be obtained by contacting: Dylan Imlah, (850)487-9102, Dylan.Imlah@myfwc.com.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 14 days before the workshop/meeting by contacting: Dylan Imlah, (850)487-9102, Dylan.Imlah@myfwc.com. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).

For more information, you may contact: Diana Kilgore, (850)487-7063, Diana.Kilgore@myfwc.com.

Dylan Imlah 09/14/18

12.6 Public Input

12.6.1 Management Advisory Group Meeting Results

Herky Huffman/Bull Creek Wildlife Management Area Management Advisory Group (MAG) Consensus Meeting Results

August 1, 2018 in Kissimmee, 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 August 1, 2018 at Osceola County Administration Building, in Kissimmee, Florida in Osceola County. The ideas found below were provided by stakeholders for consideration in the 2018-2028 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.	[11]	[16]	1. Continue prescribed fire program. A lot of natural communities are in really good shape, and that needs to be maintained with fire. Approximately 18,000 acres of fire adapted communities exist on the area, and about 1/3 of those acres are burned each year.
2.	[9]	[18]	2. Continue removal of exotic plants. The more natural/native an area is managed, the better it is for butterflies.
3.	[6]	[20]	4. Continue management of rare plant and animal species. Florida's climate is changing, and management activities should adapt.
4.	[6]	[21]	8. Protect and maintain native plant communities.
5.	[5]	[16]	3. Increase passive recreation opportunities. Perhaps add an additional parking area for non-hunting access.
6.	[5]	[19]	20. Coordinate with other agencies regarding future development. Work with other agencies to plan for the future development of the region to avoid negative impacts of the WMA.
7.	[3]	[10]	7. Balance recreation with human impacts. Determine the value of the ecosystem services and balance that with the economic value of the area.
8.	[3]	[10]	16. Coordinate with SJRWMD for hydrological management. The SJRWMD needs to close the levee during times of high water, which causes flooding on Bull Creek. The WMD should continue to communication with FWC staff.
9.	[3]	[12]	14. Look to developing wildlife underpasses. As Deseret is developed, look to providing a wildlife underpass under U.S. 192.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
10.	[2]	[5]	15. Preserve and improve scenic value.
11.	[2]	[7]	18. Promote value of the area as a wildlife corridor. This area is part of a corridor of conservation areas, which should be promoted for their value to the region.
12.	[2]	[9]	5. Increase promotion of the area. Possibly add a sign to US 192. Increasing public access will increase use, awareness, and public support for the area. Public users can also provide a source of volunteers.
13.	[1]	[1]	10. Continue to allow access for the Florida National Scenic Trail.

Two items of equal rank:

14.	[1]	[3]	6. Increase quality deer management. Increase antler restrictions to improve the deer harvest.
15.	[1]	[3]	9. Utilize mechanical treatments where appropriate.

Five items of equal rank:

16.	[1]	[5]	11. Continue to cooperate with law enforcement.
17.	[1]	[5]	12. Continue management of known historic sites.
18.	[1]	[5]	13. Improve trail connectivity. Look into linking other conservation areas in the region.
19.	[1]	[5]	17. Look towards increasing bear population if appropriate. Bring in bears from areas of high bear populations if feasible.
20.	[1]	[5]	19. Increase trail maintenance opportunities during cool season.

Herky Huffman/Bull Creek Wildlife Management Area

MAG Meeting Participants

<u>Name</u>	<u>Affiliation</u>
Active Participants	
James Blush	FWC Area Biologist
Lt. Kenneth Trusley	FWC Law Enforcement
Amy Copeland	St. Johns River Water Management District
Linda Cooper	North American Butterfly Association
Ricky Lackey	National Wild Turkey Federation
Janet Schneider	Florida Sport Horse Club
Larry Rosen	Kissimmee Valley Audubon Society
Krista Stump	UF/IFAS Extension Office
Stephen Stipkovits	Florida Forest Service
Kelly Wiener	Florida Trail Association
Dane Huffman	Forever Florida
Daniel Brockhaus	Osceola County Natural Resources Department
Valerie Anderson	Florida Native Plant Society
Supportive Participants	
Mike Abbott	FWC Habitat and Species Conservation (HSC), Regional Biologist
Tina Hannon	FWC Habitat and Species Conservation (HSC), Assistant Regional Biologist
Steve Glass	FWC HSC, District Biologist
Travis Blunden	FWC HSC, District Biologist
Tom M. Matthews	FWC Public Access and Services Office (PASO)
Andrea Boliek-Walker	FWC Division of Hunting and Game Management
Ed Perry	North American Butterfly Association
Sandy Webb	Audubon Society and Native Plant Society
Nicholas Stelzer	FWC Law Enforcement

Bill Turman

Florida Trail Association

Nicholas Stelzer

FWC Law Enforcement

Invited but Unable to Attend

Jason O'Donoghue

Division of Historical Resources

Dan Hipes

Florida Natural Areas Inventory

Fred Hawkins Jr.

Osceola County Commissioner

Cori Carpenter

Osceola County Planning Department

Chuck O'Rourke

Natural Resources Conservation Service

Ed Rysak

Department of Environmental Protection

Leslee Mitcheel

Florida Freewheelers

Steve Monroe

Friends of Bull Creek, INC

Mark Asleson

FWC HSC, Landowner Assistance Program

Katherine Burke

FWC PASO

FWC Planning Personnel

Dylan Imlah

Lead Planner, Facilitator

Lance Jacobson

Recorder

Lindsay Slautterback

Recorder

12.6.2 Public Hearing Report

**PUBLIC HEARING REPORT
FOR
HERKY HUFFMAN/BULL CREEK WILDLIFE MANAGEMENT AREA
MANAGEMENT PLAN
HELD BY THE
HERKY HUFFMAN/BULL CREEK WILDLIFE MANAGEMENT AREA
MANAGEMENT ADVISORY GROUP
AND THE
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
SEPTEMBER 20, 2018 – OSCEOLA COUNTY, FLORIDA**

The following report documents the public input that was received at the Herky Huffman/Bull Creek WMA Management Advisory Group's (MAG) public hearing for the update to the Management Plan for HHBCWMA that was held at 7:00-9:00 PM, on September 20, 2018 at the Osceola Board of County Commissioner Chambers in Kissimmee, Florida.

Herky Huffman/Bull Creek WMA Management Advisory Group Introduction:

The meeting was introduced by Ms. Valerie Anderson, a Herky Huffman/Bull Creek WMA Management Advisory Group participant, who represented the HHBCWMA MAG. Ms. Anderson indicated that she was one of 13 stakeholders that attended the Florida Fish and Wildlife Conservation Commission (FWC) facilitated HHBCWMA MAG meeting held on August 1st, 2018. Ms. Anderson stated that the Draft Management Plan was being presented tonight by the FWC staff, and that hardcopies of the draft plan and the HHBCWMA MAG meeting report were available at the front door for the public's review. Ms. Anderson thanked everyone for attending and then introduced Ms. Dylan Imlah, Land Conservation Planner, FWC, to facilitate and coordinate the presentation of an overview of HHBCWMA, FWC's planning process, and the draft components of the HHBCWMA Draft Management Plan.

Presentation on an Overview of HHBCWMA and the FWC

Planning Process:

Ms. Dylan Imlah welcomed everyone and thanked the public for their attendance. Ms. Imlah 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 HHBCWMA, and not hunting and fishing regulations, indicating there is a separate public input process for the FWC rule and regulation development. Ms. Imlah then described the materials that were available at the door for public review, including the HHBCWMA Draft Management Plan and the MAG Meeting Report and Accomplishment Report. Ms. Imlah then presented the agenda for the public hearing and facilitated the introduction of all the FWC staff in attendance to the audience. Ms. Imlah then presented an overview and orientation of the HHBCWMA, including a description of the natural communities, data about the HHBCWMA 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. She also explained the 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 HHBC WMA

Overview and FWC's Planning Process:

Ms. Imlah 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. Ms. Imlah again emphasized that the exclusive purpose for the public hearing was to collect public input regarding the Draft Management Plan for the HHBCWMA, and not to discuss area hunting, fishing and use regulations since, as was noted earlier, the FWC has a separate process for input on hunting and fishing regulations.

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

Presentation of the HHBC WMA Draft Management Plan:

At this point, Mr. Jim Blush, the HHBCWMA Area Biologist/Manager began the presentation of the HHBCWMA Draft Management Plan. Mr. Blush then completed and concluded the presentation of the HHBCWMA Draft Management Plan.

Questions and Comments on the HHBCWMA Draft Management Plan Presentation:

Ms. Imlah 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. She informed them that all comments, questions, and public testimony will be duly considered equally by the FWC.

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

Can you explain the inholding that you were referencing?

FWC Response: Mr. Blush, Biologist and Manager, responded:

That is easier to point out on the map. There's an issue there with the boundary. That area is fenced off as a square, and in our WMA brochures we don't manage anything within that square, but technically the Water Management District (St. Johns River) owns part of that land. So, there is a little bit of an issue there that needs to be worked out. That is why we want to include it in this plan.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

Can you summarize the major changes between the old management plan and this one -- the big items?

FWC Response: Mr. Blush, Biologist and Manager, responded:

The Climate change adaptation is a new thing. The management activities will mostly stay the same. Some acreage will change because we've updated natural community areas, so we have more accurate acreages on those. Little things like that have changed, but there hasn't been many major changes from the previous plan.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

Hasn't there been some change with the structures, levy, and creek line?

FWC Response: Mr. Blush, Biologist and Manager, responded:

Because of the flooding, due to tropical storms and hurricane Irma, we've had some long periods of flooding and it does change things.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

It even started before that.

FWC Response: Mr. Blush, Biologist and Manager, responded:

Yea I have only seen it through those (hurricane Irma and tropical storms). I have only been here for about 4 years.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

There have been some significant changes due to the flooding. It is not the same place.

FWC Response: Mr. Blush, Biologist and Manager, responded:

I'm sure it did, the WMD has their goals and priorities to prevent flooding. When the St. Johns River reaches a certain level peoples houses can become flooded. They've got to stop creeks from flowing into the river. That's something we've added to the plan – trying to cooperate better with them and improve our communication with them. Communication is currently pretty good, they usually give us a heads up when issues arise and when they are closing the flood gates, so we know what's coming and can start planning road closures and things like that. As far as habitat management there's not much you can do to prepare for that. However, afterward we can follow up and try to burn off some of the dead biomass and encourage new growth, which is exactly what we did this year.

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

I have a couple questions. When I look at this particular slide, you're adding one and a half miles, at what area would that be planned for?

FWC Response: Mr. Blush, Biologist and Manager, responded:

That was the area off the walk-in entrance off Crab Grass road.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

I'm interested, when you're looking at kiosk and education opportunities, if they're located close enough that you can have a shorter trail for more accessibility issues, not for hunting, but for wildlife observations and those types of things. Kind of like the sunset ranch area. The possibility of having easier access to some of the property for people who might need it with a wheel chair or who have issues walking. The county's been doing a lot with crushed

concrete and it might be great for hikers. Just thinking for the educational goals that you're going to have linked to this property.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

Also, there were a couple of mentions of challenges and concerns about what's happening adjacent to the property and not just with the inholding, but in that region. It's going to be important for FWC to have a mobile role, not just "were going to review it and have comments on paper". The Osceola county master plan and the urban growth boundary keeps moving closer and closer, and looking at transportation corridors on a region basis, not just Osceola county, and ensuring to maintain the integrity of those ecosystems and being able to manage for game and non-game wildlife issues. So, I would encourage that and however it needs to be incorporated into the plan and coordinate with Osceola county. I also believe there's a difference between coordinating and playing an active role.

FWC Response: Ms. Imlah, Land Conservation Planner, responded:

We do have offices that are actively involved with those processes; we all know about the highway extensions and we've been actively involved with that and attended all the meetings. We do the best we can to help the coordination, and there will be an entire section dedicated to that in the plan.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

Yes, but that is a piece of the puzzle and when I look at these conservation corridors or other conservation lands that might not be managed by a state agency, and your input will be very important.

FWC Response: Ms. Imlah, Land Conservation Planner, responded:

Absolutely.

Public Response: Another unidentified member of the audience provided the following comments and questions.

Especially with the development that is going to be happening in the north.

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

Public Testimony on the HHBCWMA Draft Management Plan:

Four member(s) of the public audience submitted speaker card(s) indicating their intention to provide formal public testimony. Ms. Imlah again emphasized that the public hearing was for taking input regarding the HHBCWMA Draft Management Plan, and called the first speaker to the podium.

Public Testimony #1: Cameron Gordon provided the following public testimony:

I have to confess, I echo the sentiment that I heard a minute ago. Well first, I have a great appreciation for FWC staff, I always have, and I enjoy the fruits of your labor, so I do appreciate that; it's really a privilege.

A little bit about Herky Huffman/Bull Creek – I have, since I've started using the area, brought a dozen brand new hunters. Although it's not all about hunting, and I do appreciate the other stakeholder groups, such as Florida Native Plant Society and Audubon. I have brought a dozen folks over the time who have participated and bought the one-year deferment license, so they hadn't taken their hunting safety course yet, so they're brand new to the sport, and Bull Creek is the first place I've taken them; it's got good roads, diverse ecosystems and I can show them different types of game. And of those 12, eight of them are still very active, and all of them went on to take the hunter safety course, and the eight are still very active and are buying licenses every year. So, there is some incentive, financially, for the well-being of FWC to have areas like this.

Beyond patting you on the back and saying thank you for what you do, and thank you for taking into account the comments of the stakeholder, I've gone to FWC with requests, a lot of which have to do with this and other WMAs, and gotten feedback, and seen them implemented, and if not, why, so just keep up the transparency – we really appreciate it.

In closing, I was born and raised in Orlando, and I really fell in love with the rural areas outside of Orlando. I learned to enjoy the outdoors, and I love the idea that there are these huge natural areas left. Being raised in Orlando, I have seen the area in my lifetime grow exponentially, and it's tragic. For the sake of the environment, for the sake of places like Bull Creek and its wellbeing, but also from a sentimental point of view, when I hear what Desert Ranch and other organizations have pushed through, it's heartbreaking. And against the backdrop of impending development I think it's crucial that you all continue to be supported by user groups like us and like the lady said, I know you have to have a certain level of decorum and professionalism between agencies, and that's a hard line to cross. There is a line at which I've seen most of these central Florida counties, but especially Osceola, the rural boundary, become malleable like a piece of Laffey Taffy – it's almost laughable, and it's a shame. It hits places like Herky Huffman hard.

Over the last couple years, a large portion of this land, was on the table for a land swap. The potential was that user groups, like hunters, hikers, birdwatchers, kayakers, were going to

lose thousands of acres. I don't know what you can do but do what you can to fight it. You listen to us, you advocate for us and you have amazing management of this land. I think the preservation of it, in its entirety, every square inch, in perpetuity, is paramount. That is the number one most important thing I think we can focus on – is not losing one inch of that ground. Mr. Blush, you talked about the surplus land being unneeded, and that's a standard thing, and I don't know what goes into the determination, but I would hope that not a single palmetto would leave this area. Thank you for hearing us tonight, thank you for doing what you're doing, and know that we have your back and we know that you have ours. We appreciate all your hard work.

Public Testimony #2: Steve Monroe provided the following public testimony:

My new is Steve Monroe- I'm the director of Friends at Bull Creek, and on behalf of our group, I'd like to extend our volunteer efforts to help you meet these goals and objectives for this management plan. When we formed in 97' we were at risk for losing ten thousand acres from this area. We gathered as a group and didn't realize how many other user groups used this area. We were successful, we were able to preserve 100% of the area, but we moved on from there and began to work with WMD and FWC. We worked with WMD as far as improving the roads and to promote or request modifications be done to the structures of the levy to help curve the flooding and the damage that was occurring.

We work with the Audubon and did a blue bird project with them, and we planted trees at the campground with help from the Turkey Federation. We built the game skinning shed in the campground. We work with Florida trails association and helped dig some of their wells. I guess in summary, what I'm trying to say is we have resources here, we've got a new group of folks who are coming to play and they're very full of energy and very active, consider them a resource to help you on projects. I think that is what they are going to be looking towards before long. What projects we can do to help you on. Thank you.

Public Testimony #3: Valerie Anderson provided the following public testimony:

I'm going to start by saying that I really like that the optimal boundary has moved up to an existing wildlife corridor that includes the innovation way overlay – which will contain a lot of, at least very narrow connectivity in Orange County based on the environmental lands stewardship program, which is not a program we have in Osceola County. I'm happy to hear this because this is considered priority one greenway on the critical lands, the CLIP geodata layers set by the geoplan from the university of Florida.

I would hope to see all the properties that are touched by this existing, somewhat threatened wildlife corridor, be included in the list of county and city properties that are in the prospectus, including the Mary A Ranch Mitigation Bank, Spilt Oak and Moss Park. If not built correctly, the northeast district could cut off corridors between Lake Lizzie, Lake X, and Bull Creek. Also, I think what is really critical is to start advocating now for a wildlife crossing at the Cut Throat Creek. Because that's the only land that Desert has committed to

protecting is this corridor that goes from triple N and Herky Huffman up. And we don't know when they're going to redo 192, but we do know traffic is going to increase on that road really soon, and as areas get built out and as the northeast district gets built out, and of course they are going to do innovation way and areas here (pointing at map), and with the Osceola Parkway extension they are going to start at the northeast connector and that could bring epic amounts of issues and could clip out a part of Lake X, so there will be even more sprawl potentially impacting Herky Huffman. So we need to start advocating for at least what we know we have already negotiated with Desert such as the potential cross under 192, which is critical. I know it's a little far out for the Native Plant Society, but we'd like to help support your efforts in monitoring what you have with bio blitzes and bring more attention to the area.

Adjournment:

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

No other speakers offered further comments.

Then Ms. Imlah declared the public hearing adjourned.

12.6.3 Management Prospectus



Management Prospectus

Herky Huffman/Bull Creek Wildlife Management Area

September 2018

Florida Fish and Wildlife Conservation Commission

- **Introduction**

The Herky Huffman/Bull Creek Wildlife Management Area (HHBCWMA), encompassing approximately 23,495 acres, contains mostly wet and mesic plant communities, with approximately 15,086 acres of uplands and 8,409 acres of wetlands. The HHBCWMA provides protection of the floodplain that includes the Crabgrass, Jane Green and Bull Creek systems. The property is connected to Three Forks Marsh Conservation Area to the east by a conservation easement acquired by the St. Johns River Water Management District (SJRWMD) and to the west by Triple N Ranch WMA. This area provides an extensive and significant wildlife corridor and floodplain protection for the surrounding areas. The surrounding privately-owned lands are used for agricultural purposes, primarily cattle production and citrus.

The HHBCWMA provides regional flood and natural community protection. This is the only SJRWMD property in the St. Johns River upper basin that represents the entire spectrum of plant communities that occur in this region, and that have had very low impact due to human activities. There are also significant benefits to the public as the HHBCWMA provides both passive recreation (hiking, biking, wildlife viewing, etc.) and hunting and fishing opportunities. It also provides significant habitat for wildlife and provides a wildlife corridor from Triple N Ranch WMA to Three Forks Marsh Conservation Area.

The HHBCWMA is owned by the SJRWMD and the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees). The Florida Fish and Wildlife Conservation Commission (FWC) holds the lease and has lead management authority for all resources within the HHBCWMA established boundary. The HHBCWMA is managed to conserve and restore natural wildlife habitats, and to provide high-quality opportunities for fishing, wildlife viewing, environmental education, and other fish- and wildlife-based public outdoor recreation opportunities including boating and hiking.

This resource and management prospectus has been developed in conformance with the requirements of Section 259.032, Florida Statutes, to provide the Management Advisory Group stakeholders and the general public with a general understanding of, and purpose

for the HHBCWMA, prior to the required public hearing to solicit public input on the HHBCWMA management plan.

- **Nearby Conservation Lands and Florida Forever Projects**

The HHBCWMA is located in the vicinity of an extensive network of conservation lands, including lands managed by the SJRWMD and Osceola County. Several Florida Forever projects (Figure 4), are also located in the vicinity of the area.

Tables 1 and 2 list the Florida Forever projects and conservation lands within a 15-mile radius of the HHBCWMA, including lands managed by public and private entities, that conserve cultural and natural resources within this region of Florida.

Most of the conservation lands listed in Table 2 are owned in full-fee by a public entity. However, some of these areas fall within a less-than-fee ownership classification where the land is owned and being managed by a private landowner while a public agency or not-for-profit organization holds a conservation easement on the land.

Table 1. Florida Forever Projects in a 15-mile Vicinity

Project Name	GIS Acres
Adams Ranch	7,141.13
Big Bend Swamp/Holopaw Ranch	56,729.44
Brevard Coastal Scrub Ecosystem	7,276.76
Conlin Lake X	9,074.82
Osceola Pine Savannas	46,628.01
Ranch Reserve	36,409.91

Table 2. Conservation Lands in the Vicinity

Water Management District	Managing Agency
Blue Cypress Conservation Area	SJRWMD
Escape Ranch Conservation Easement	SJRWMD
Far Reach Ranch Conservation Easement	SJRWMD
Jane Green Creek Less-than-fee Easement Additions	SJRWMD
Kaschai Conservation Easement	SJRWMD
Kempfer Property Conservation Easement	SJRWMD
Kempfer Property Flowage Easement	SJRWMD
Kissimmee Chain of Lake	SFWMD
Mills Ranch Conservation Easement	SJRWMD
River Lakes Conservation Area	SJRWMD
Three Forks Conservation Area	SJRWMD
Willowbrook Conservation Easement	SJRWMD

Table 2. Conservation Lands in the Vicinity

Wolf Creek Ranch Conservation Easement	SJRWMD
State of Florida	Managing Agency
Adams Ranch Agricultural and Conservation Easement #1	DACS-FFS
Adams Ranch Agricultural and Conservation Easement #3	DACS-FFS
Broussard Conservation Easement	DEP-DSL
Camp Lonesome Agricultural and Conservation Easement #1	DACS-FFS
Camp Lonesome Agricultural and Conservation Easement #2	DACS-FFS
Camp Lonesome Conservation Easement	DEP-DSL
Holopaw State Forest	DACS-FFS
Ox Creek Ranch Agricultural and Conservation Easement	DACS-FFS
Three Lakes Wildlife Management Area	FWC
T.M. Goodwin Waterfowl Management Area	FWC
Triple N Ranch Wildlife Management Area	FWC
Whaley Conservation Easement	DEP-DSL
Federal Government	Managing Agency
Adams Ranch Conservation Easement	USFWS
Camp Lonesome Conservation Easement	USFWS
Malabar Transmitter Annex	USDOD-Air Force
County/City	Managing Agency
Erna Nixon Park	Brevard County
Lake Lizzie Conservation Area	Osceola County
Lonesome Camp Ranch Conservation Area	Osceola County
Private/Public Conservation Organization	Managing Agency
Disney Wilderness Preserve	TNC
Mary A Ranch Mitigation Bank	B.K.I., Inc., Consulting Ecologists
Southport Ranch Mitigation Bank	Mitigation Resources, LLC

Acronym Key	Agency Name
DACS-FFS	FL Department of Agricultural and Consumer Service-Florida Forest Service
DEP-DSL	FL Department of Environmental Protection-Division of State Lands
FWC	FL Fish and Wildlife Conservation Commission
SJRWMD	St. Johns River Water Management District
SFWMD	South Florida Water Management District
TNC	The Nature Conservancy
USDOD-Air Force	U.S. Department of Defense- Air Force
USFWS	U.S. Fish and Wildlife Service

• **Acquisition History**

The original 22,055 acres of the HHBCWMA was purchased in 1967 by the Central and Southern Florida Flood Control District and subsequently transferred to the SJRWMD in 1977. In 1970, the area was leased to the then Game and Fresh Water Fish Commission, now the FWC, to be managed as a wildlife management area. For management purposes, approximately 1,279 acres of the Triple N Ranch WMA were established as part of the HHBCWMA in 1996. These lands were originally acquired using Save Our Rivers funds partly appropriated to the SJRWMD from Preservation 2000 Land Acquisition Program (P-2000), and funds appropriated to FWC as its share of the P-2000 Inholdings and Additions Acquisition Program funding. In 2001, additional lands (161 acres) were added to the HHBCWMA through the Osceola Pines Savannah Florida Forever conservation acquisition project.

• **Purpose for Acquisition**

The HHBCWMA was acquired by the SJRWMD and the Board of Trustees to protect and enhance water resources, for flood protection and control, and to protect ecological functions and habitat in the Bull Creek area. In addition, according to the Florida Forever Five-year Plan the “Osceola Pine Savannas project will conserve a large part of these lands, maintaining a link of natural lands between the HHBCWMA and the Three Lakes Wildlife Management Area. Preserving these lands will help ensure the survival of wildlife including swallow-tailed kite and the crested caracara. Together with the two wildlife management areas, this project provides a large area for the public to enjoy hunting, wildlife observation, and other activities.”

The HHBCWMA is managed by the FWC for the purpose of operating as a wildlife management area, providing ecological diversity, providing managed habitats for both common and imperiled wildlife, and providing the public with fish- and wildlife-oriented outdoor recreational opportunities.

• **Title and Encumbrances**

The SJRWMD holds fee title interest for approximately 22,055 acres of the HHBCWMA. A 50/50 undivided title interest is held jointly by the SJRWMD and the Board of Trustees for

approximately 1,279 acres located in the northwest corner of the managed area. Approximately 161 acres in the southwest corner of the managed area is titled to the Board of Trustees. There is also a 3,600-acre flowage easement encumbrance held by the SJRWMD that exists for the Jane Green Creek floodplain. There are no other known encumbrances or outstanding mineral rights or other interests within the established boundary.

Additional FWC management authority derives from Article IV, Section 9 of the Florida Constitution as well as the guidance and directives of Chapters 253, 259, 327, 370, 372, 375, 378, 379, 403, 487, 597, and 870 of the Florida Statutes. These laws establish the authority of the FWC with regard to protection and management of the State’s fish and wildlife resources.

- **Natural Resources**

Through the services of the Florida Natural Areas Inventory (FNAI), the FWC has mapped the current natural and anthropogenic communities of the HHBCWMA which describes 17 natural and anthropogenic community types existing on the HHBCWMA, (Table 3, and Figure 5). FWC biologists, along with contracted surveys through the FNAI, have documented a variety of invasive exotic plant species (Table 6) as occurring on the HHBCWMA. Figure 6 also maps out the historic natural communities of the HHBCWMA, which depicts the composition of native plant communities on the area prior to substantial alteration of the region’s hydrology and land for agricultural and development uses. Additionally, plant species found at the HHBCWMA have been recorded (Table 4), and there are 22 rare plants (Table 5) and 24 exotic invasive plants within the HHBCWMA.

The FNAI element occurrence records include several threatened or endangered species and species of special concern. Known locations of FWC wildlife occurrences and FNAI element occurrences from the most recent GIS databases of the respective agencies are displayed in Figure 7. As defined by the FNAI, an “element” is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. An element occurrence is a single extant habitat which sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Table 3. Natural Community Types on the HHBCWMA

Community Type	GIS Acres	Percentage
Baygall	284.7	1.2%
Depression marsh	967.0	4.1%
Dome swamp	1,428.9	6.0%
Dry prairie	527.5	2.2%
Floodplain swamp	2,853.0	12.1%
Hydric hammock	1,179.5	5.1%

Mesic flatwoods	11,805.4	50.0%
Mesic hammock	176.4	0.7%
Pasture - improved	25.9	0.1%
Pasture – semi-improved	1.7	<0.1%
Pine plantation	8.8	<0.1%
Ruderal	459.5	2.0%
Sandhill	4.6	<0.1%
Scrub	159.3	0.7%
Scrubby flatwoods	959.1	4.1%
Wet flatwoods	2,058.6	8.7%
Wet prairie	577.2	2.4%

Table 4. Native Plant Species Known or Expected to Occur on the HHBCWMA

Common Name	Scientific Name
Adam's needle	<i>Yucca filamentosa</i>
Airplant	<i>Tillandsia</i> sp.
Alligatorflag	<i>Thalia geniculata</i>
American beautyberry	<i>Callicarpa americana</i>
American elm	<i>Ulmus americana</i>
American hornbeam	<i>Carpinus caroliniana</i>
American waterhorehound	<i>Lycopus americanus</i>
Arrowfeather threeawn	<i>Aristida purpurascens</i>
Aster	<i>Symphyotrichum</i> sp.
Atlantic St. Johns wort	<i>Hypericum tenuifolium</i>
Bahiagrass	<i>Paspalum notatum</i>
Bald cypress	<i>Taxodium distichum</i>
Baldwin's milkwort	<i>Polygala baldwinii</i>
Baldwin's spikerush	<i>Eleocharis baldwinii</i>
Ballmoss	<i>Tillandsia recurvata</i>
Basswood	<i>Tilia</i> sp.
Beaked panicum	<i>Panicum anceps</i>
Beaksedge	<i>Rhynchospora</i> sp.
Bearded grass-pink	<i>Calopogon barbatus</i>
Beggarticks	<i>Bidens</i> sp.
Big carpetgrass	<i>Axonopus furcatus</i>
Bigleaf snowbell	<i>Styrax grandifolius</i>
Blackberry	<i>Rubus</i> sp.
Blackroot	<i>Pterocaulon pycnostachyum</i>
Bladderwort	<i>Utricularia</i> sp.
Blazing star	<i>Liatris</i> sp.
Blue huckleberry	<i>Gaylussacia frondosa</i> var. <i>tomentosa</i>
Blue maidencane	<i>Amphicarpum muhlenbergianum</i>

Blue-eyed grass	Sisyrinchium sp.
Bluestem	Andropogon sp.
Bluestem	Schizachyrium sp.
Bluethread	Burmannia biflora
Bog white violet	Viola lanceolata
Bogbutton	Lachnocaulon sp.
Bottlebrush threeawn	Aristida spiciformis
Bracken fern	Pteridium sp.
Branched hedgehyssop	Gratiola ramosa
Broomsedge bluestem	Andropogon virginicus
Bulltongue arrowhead	Sagittaria lancifolia
Bully	Sideroxylon sp.
Bulrush	Scirpus sp.
Bushy bluestem	Andropogon glomeratus
Butterwort	Pinguicula sp.
Button rattlesnakemaster	Eryngium yuccifolium
Cabbage palm	Sabal palmetto
Calloose grape	Vitis shuttleworthii
Camphorweed	Pluchea sp.
Canadian germander	Teucrium canadense
Candyroot	Polygala nana
Capillary hairsedge	Bulbostylis ciliatifolia
Carolina ash	Fraxinus caroliniana
Carolina redroot	Lachnanthes caroliniana
Carolina yellow-eyed grass	Xyris caroliniana
Chalky bluestem	Andropogon virginicus var. glaucus
Chapman's oak	Quercus chapmanii
Chrysogonum	Chrysogonum sp.
Climbing hempvine	Mikania scandens
Club-moss	Lycopodiella sp.
Clustered bushmint	Hyptis alata
Clustered mille grains	Oldenlandia uniflora
Clustered sedge	Carex glaucescens
Coastal rosegiant	Sabatia calycina
Coastalplain chaffhead	Carphephorus corymbosus
Coastalplain honeycomb-head	Balduina angustifolia
Coastalplain milkwort	Polygala setacea
Coastalplain St. Johns wort	Hypericum brachyphyllum
Coastalplain staggerbush	Lyonia fruticosa
Coastalplain willow	Salix caroliniana
Colic-root	Aletris sp.
Combleaf mermaidweed	Proserpinaca pectinata
Common buttonbush	Cephalanthus occidentalis

Common persimmon
Coneflower
Coral greenbrier
Crabgrass
Creeping primrose willow
Crimson bluestem
Crowngrass
Cypress
Dahoon
Darrow's blueberry
Deerberry
Dense gayfeather
Dixie Whitetop aster
Dock
Dogfennel
Dotted smartweed
Drumheads
Dwarf huckleberry
Dwarf live oak
Dwarf sundew
Earleaf greenbrier
Early blue violet
Early whitetop fleabane
Eastern gamagrass
Eastern milkpea
Eastern poison ivy
Elderberry
Elliott's bluestem
Elliott's milkpea
Elliott's yellow-eyed grass
Erectleaf witchgrass
Eryngo
False foxglove
False nettle
Fetterbush
Fewflower gayfeather
Fimbry
Fireweed
Flatsedge
Flattened pipewort
Fleabane
Florida air-plant
Florida bluestem

Diospyros virginiana
Rudbeckia sp.
Smilax walteri
Digitaria sp.
Ludwigia repens
Schizachyrium sanguineum
Paspalum sp.
Taxodium sp.
Ilex cassine
Vaccinium darrowii
Vaccinium stamineum
Liatris spicata
Sericocarpus tortifolius
Rumex sp.
Eupatorium capillifolium
Polygonum punctatum
Polygala cruciata
Gaylussacia dumosa
Quercus minima
Drosera brevifolia
Smilax auriculata
Viola palmata
Erigeron vernus
Tripsacum dactyloides
Galactia regularis
Toxicodendron radicans
Sambucus nigra ssp. canadensis
Andropogon gyrans
Galactia elliottii
Xyris elliottii
Dichanthelium erectifolium
Eryngium sp.
Agalinis sp.
Boehmeria cylindrica
Lyonia lucida
Liatris pauciflora
Fimbristylis sp.
Erechtites hieraciifolius
Cyperus sp.
Eriocaulon compressum
Erigeron sp.
Tillandsia simulata
Andropogon floridanus

Florida dropseed
Florida false sunflower
Florida rosemary
Florida tickseed
Fourpetal St. Johns wort
Fragrant eryngo
Fringed bluestar
Fringed nutrush
Fringed yellow stargrass
Fringed yellow-eyed grass
Gallberry
Georgia tickseed
Giant sedge
Giant white-top
Golden polypody
Goldenclub
Goldenrod
Gopher apple
Grassleaf roseling
Grassy arrowhead
Greater bladder sedge
Green ash
Groundsel tree
Hairawn muhly
Hairsedge
Hawkweed
Hedgehyssop
Highbush blueberry
Hoary-pea
Hog plum
Hop sedge
Horned bladderwort
Hottentot fern
Humped bladderwort
Iris
Jack-in-the-pulpit
Jamaica swamp sawgrass
Jeweled blue-eyed grass
Jointgrass
Knotted spikerush
Largeflower jointweed
Lattice jointgrass
Laurel greenbrier

Sporobolus floridanus
Phoebanthus grandiflorus
Ceratiola ericoides
Coreopsis floridana
Hypericum tetrapetalum
Eryngium aromaticum
Amsonia ciliata
Scleria ciliata
Hypoxis juncea
Xyris fimbriata
Ilex glabra
Coreopsis nudata
Carex gigantea
Rhynchospora latifolia
Phlebodium aureum
Orontium aquaticum
Solidago sp.
Geobalanus oblongifolius
Callisia graminea
Sagittaria graminea
Carex intumescens
Fraxinus pennsylvanica
Baccharis halimifolia
Muhlenbergia capillaris
Bulbostylis sp.
Hieracium sp.
Gratiola sp.
Vaccinium corymbosum
Tephrosia sp.
Ximenia americana
Carex lupulina
Utricularia cornuta
Thelypteris interrupta
Utricularia gibba
Iris sp.
Arisaema triphyllum
Cladium jamaicense
Sisyrinchium xerophyllum
Coelorachis sp.
Eleocharis interstincta
Polygonella robusta
Coelorachis tessellata
Smilax laurifolia

Laurel oak	<i>Quercus hemisphaerica</i>
Lax hornpod	<i>Mitreola petiolata</i>
Leafless swallowwort	<i>Orthosia scoparia</i>
Leather flower	<i>Clematis</i> sp.
Lemon bacopa	<i>Bacopa caroliniana</i>
Lesser creeping rush	<i>Juncus repens</i>
Lesser Florida spurge	<i>Euphorbia polyphylla</i>
Licoriceweed	<i>Scoparia dulcis</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Little floating bladderwort	<i>Utricularia radiata</i>
Live oak	<i>Quercus virginiana</i>
Lizard's tail	<i>Saururus cernuus</i>
Lobelia	<i>Lobelia</i> sp.
Loblolly bay	<i>Gordonia lasianthus</i>
Loblolly pine	<i>Pinus taeda</i>
Longleaf pine	<i>Pinus palustris</i>
Longleaf threeawn	<i>Aristida palustris</i>
Lopsided Indiangrass	<i>Sorghastrum secundum</i>
Lovegrass	<i>Eragrostis</i> sp.
Low pinebarren milkwort	<i>Polygala ramosa</i>
Maiden fern	<i>Thelypteris</i> sp.
Maidencane	<i>Panicum hemitomon</i>
Maleberry	<i>Lyonia ligustrina</i> var. <i>foliosiflora</i>
Manyflower marsh pennywort	<i>Hydrocotyle umbellata</i>
Marsh fern	<i>Thelypteris palustris</i> var. <i>pubescens</i>
Marsh pennywort	<i>Hydrocotyle</i> sp.
Meadowbeauty	<i>Rhexia</i> sp.
Milkpea	<i>Galactia</i> sp.
Milkweed	<i>Asclepias</i> sp.
Milkwort	<i>Polygala</i> sp.
Millet beaksedge	<i>Rhynchospora miliacea</i>
Mock orange	<i>Philadelphus</i> sp.
Mohr's thoroughwort	<i>Eupatorium mohrii</i>
Muscadine	<i>Vitis rotundifolia</i>
Myrtle oak	<i>Quercus myrtifolia</i>
Myrtleleaf St. Johns wort	<i>Hypericum myrtifolium</i>
Narrowleaf blue-eyed grass	<i>Sisyrinchium angustifolium</i>
Narrowleaf silkgrass	<i>Pityopsis graminifolia</i>
Narrowleaf sunflower	<i>Helianthus angustifolius</i>
Netted chain fern	<i>Woodwardia areolata</i>
Netted nutrush	<i>Scleria reticularis</i>
Netted pawpaw	<i>Asimina reticulata</i>
Nutrush	<i>Scleria</i> sp.

Nuttall's meadowbeauty
Oakleaf fleabane
October flower
Orange milkwort
Pale meadowbeauty
Panic grass
Panicum
Partridge pea
Partridge berry
Peelbark St. Johns wort
Pickerelweed
Piedmont blacksenna
Piedmont pinweed
Pignut hickory
Pinebarren frostweed
Pinebarren goldenrod
Pinebarren Whitetop aster
Pineland chaffhead
Pineland daisy
Pineland pimpernel
Pineland rayless goldenrod
Pineland scalypink
Pineywoods dropseed
Pink sundew
Pinweed
Pond cypress
Poor joe
Possumhaw
Prairie clover
Prairie iris
Pricklypear
Primroseleaf violet
Primrose willow
Purple bluestem
Purple thistle
Queen-devil
Queen's delight
Rabbitbells
Rattan vine
Red bay
Red cedar
Red maple
Red mulberry

Rhexia nuttallii
Erigeron quercifolius
Polygonum polygamum
Polygala lutea
Rhexia mariana
Panicum sp.
Panicum longifolium
Chamaecrista fasciculata
Mitchella repens
Hypericum fasciculatum
Pontederia cordata
Seymeria pectinata
Lechea torreyi
Carya glabra
Helianthemum corymbosum
Solidago fistulosa
Oclemena reticulata
Carphephorus carnosus
Chaptalia tomentosa
Samolus valerandi ssp. parviflorus
Bigelowia nudata
Stipulicida setacea
Sporobolus junceus
Drosera capillaris
Lechea sp.
Taxodium ascendens
Diodia teres
Viburnum nudum
Dalea sp.
Iris hexagona
Opuntia humifusa
Viola primulifolia
Ludwigia sp.
Andropogon glomeratus var. glaucopsis
Cirsium horridulum
Hieracium gronovii
Stillingia sylvatica
Crotalaria rotundifolia
Berchemia scandens
Persea borbonia
Juniperus virginiana
Acer rubrum
Morus rubra

Resurrection fern
 Rice button aster
 Rosy camphorweed
 Rough hedgehyssop
 Roundleaf bluet
 Roundleaf thoroughwort
 Roundpod St. Johns wort
 Runner oak
 Rush
 Rustweed
 Rusty staggerbush
 Saltmeadow cordgrass
 Sand blackberry
 Sand cordgrass
 Sand holly
 Sand live oak
 Sand pine
 Sand spike-moss
 Sandyfield beaksedge
 Sarsaparilla vine
 Savannah yellow-eyed grass
 Saw greenbrier
 Saw palmetto
 Sawtooth blackberry
 Scaleleaf aster
 Scrub oak
 Seaside primrose willow
 Sedge
 Sensitive pea
 Sensitive plant
 Shiny blueberry
 Shoestring fern
 Shortbristle horned beaksedge
 Shortleaf gayfeather
 Shortleaf gayfeather
 Shortleaf rosegentian
 Shortleaf wild coffee
 Shortleaf yellow-eyed grass
 Shortspike bluestem
 Skeletongrass
 Skyblue lupine
 Slash pine
 Slender flattop goldenrod

Pleopeltis michauxiana
 Symphyotrichum dumosum
 Pluchea baccharis
 Gratiola hispida
 Houstonia procumbens
 Eupatorium rotundifolium
 Hypericum cistifolium
 Quercus pumila
 Juncus sp.
 Polypremum procumbens
 Lyonia ferruginea
 Spartina patens
 Rubus cuneifolius
 Spartina bakeri
 Ilex ambigua
 Quercus geminata
 Pinus clausa
 Selaginella arenicola
 Rhynchospora megalocarpa
 Smilax pumila
 Xyris flabelliformis
 Smilax bona-nox
 Serenoa repens
 Rubus pensilvanicus
 Symphyotrichum adnatum
 Quercus inopina
 Ludwigia maritima
 Carex sp.
 Chamaecrista nictitans
 Mimosa sp.
 Vaccinium myrsinites
 Vittaria lineata
 Rhynchospora corniculata
 Liatris tenuifolia
 Liatris tenuifolia var. quadriflora
 Sabatia brevifolia
 Psychotria sulzneri
 Xyris brevifolia
 Andropogon brachystachyus
 Gymnopogon sp.
 Lupinus diffusus
 Pinus elliottii
 Euthamia caroliniana

Slimleaf pawpaw
Small butterwort
Smallfruit beggarticks
Sneezeweed
Snoutbean
Soft rush
Sour orange
Southern bogbutton
Southern cattail
Southern dewberry
Southern needleleaf
Southern umbrellasedge
Southern wood fern
Spadeleaf
Spanish moss
Sparkleberry
Spikerush
Splitbeard bluestem
Spurge
St. Andrew's cross
St. Augustine grass
St. Johns wort
Starrush white-top
Stiff sunflower
Sugarcane plumegrass
Summer farewell
Sundew
Swamp bay
Swamp dock
Swamp laurel oak
Swamp milkweed
Swamp rosemallow
Swamp tupelo
Swampforest beaksedge
Sweet goldenrod
Sweetbay
Sweetgum
Switchgrass
Tall elephantsfoot
Tall pinebarren milkwort
Tangerine
Taperleaf waterhorehound
Tarflower

Asimina angustifolia
Pinguicula pumila
Bidens mitis
Helenium sp.
Rhynchosia sp.
Juncus effusus ssp. solutus
Citrus x aurantium
Lachnocaulon beyrichianum
Typha domingensis
Rubus trivialis
Tillandsia setacea
Fuirena scirpoidea
Dryopteris ludoviciana
Centella asiatica
Tillandsia usneoides
Vaccinium arboreum
Eleocharis sp.
Andropogon ternarius
Euphorbia sp.
Hypericum hypericoides
Stenotaphrum secundatum
Hypericum sp.
Rhynchospora colorata
Helianthus radula
Saccharum giganteum
Dalea pinnata
Drosera sp.
Persea palustris
Rumex verticillatus
Quercus laurifolia
Asclepias perennis
Hibiscus grandiflorus
Nyssa sylvatica var. biflora
Rhynchospora decurrens
Solidago odora
Magnolia virginiana
Liquidambar styraciflua
Panicum virgatum
Elephantopus elatus
Polygala cymosa
Citrus reticulata
Lycopus rubellus
Bejaria racemosa

Tenangle pipewort
Thin paspalum
Threadleaf arrowhead
Threeawn
Tickseed
Toothache grass
Toothed midsorus fern
Toothpetal false rein orchid
Tracy's bluestem
Tread-softly
Tridens
Turkey oak
Umbrellasedge
Vanillaleaf
Violet
Virginia buttonweed
Virginia chain fern
Virginia creeper
Virginia marsh St. Johns wort
Virginia willow
Walter's viburnum
Wand goldenrod
Ware's hairsedge
Warty sedge
Water cowbane
Water hickory
Water locust
Water oak
Wax myrtle
Whip nutrush
White waterlily
Whitehead bogbutton
Wild coffee
Wild olive
Wild pennyroyal
Winged sumac
Wiregrass
Witchgrass
Woolly huckleberry
Woolly witchgrass
Yellow colic-root
Yellow hatpins
Yellow jessamine

Eriocaulon decangulare
Paspalum setaceum
Sagittaria filiformis
Aristida sp.
Coreopsis sp.
Ctenium aromaticum
Blechnum serrulatum
Habenaria floribunda
Andropogon tracyi
Cnidoscolus stimulosus
Tridens sp.
Quercus laevis
Fuirena sp.
Carphephorus odoratissimus
Viola sp.
Diodia virginiana
Woodwardia virginica
Parthenocissus quinquefolia
Triadenum virginicum
Itea virginica
Viburnum obovatum
Solidago stricta
Bulbostylis warei
Carex verrucosa
Tiedemannia filiformis
Carya aquatica
Gleditsia aquatica
Quercus nigra
Morella cerifera
Scleria triglomerata
Nymphaea odorata
Lachnocaulon anceps
Psychotria nervosa
Osmanthus americanus
Piloblephis rigida
Rhus copallinum
Aristida stricta var. beyrichiana
Dichantherium sp.
Gaylussacia mosieri
Dichantherium scabriusculum
Aletris lutea
Syngonanthus flavidulus
Gelsemium sempervirens

Yellow milkwort	Polygala rugelii
Yellow stargrass	Hypoxis sp.
Yellow-eyed grass	Xyris sp.
Zigzag bladderwort	Utricularia subulata

Table 5. Imperiled plant Species observed on the HHBCWMA

Common Name	Scientific Name	Status
Blue-flowered butterwort	Pinguicula caerulea	ST
Butterfly orchid	Encyclia tampensis	CE
Cardinal flower	Lobelia cardinalis	ST
Catesby lily	Lilium catesbaei	ST
Cinnamon fern	Osmunda cinnamomea	CE
Common wild-pine	Tillandsia fasciculata	SE
Curtiss's milkweed	Asclepias curtissii	SE
Cut-throat grass	Panicum abscissum	SE
Giant wild-pine	Tillandsia utriculata	SE
Hooded pitcher-plant	Sarracenia minor	ST
Inflated and reflexed wildpine	Tillandsia balbisiana	ST
Large-flowered rosemary	Conradina grandiflora	ST
Long-lip ladies' tresses	Spiranthes longilabris	ST
Non-crested eulophia	Eulophia ecristata	ST
Plume polypody	Polypodium plumula	SE
Royal fern	Osmunda regalis	CE
Scrub pinweed	Lechea cernua	ST
Simpson's stopper	Myrcianthes fragrans	ST
Simpson's zephyr-lily	Zephyranthes simpsonii	ST
Spiny-pod	Matelea sp.	SL
Swamp plume polypody	Polypodium ptilodon	SE
Yellow-flowered butterwort	Pinguicula lutea	ST

Acronym	Status
CE	Commercially Exploited
SE	State Endangered
SL	State Listed
ST	State Threatened

Table 6. Exotic Invasive Plant Species Known to Occur on the HHBCWMA

Common Name	Scientific Name	FLEPPC Category
Air-potato	<i>Dioscorea bulbifera</i>	I
Brazilian pepper	<i>Schinus terebinthifolius</i>	I
Caesar's weed	<i>Urena lobata</i>	I
Castor bean	<i>Ricinus communis</i>	II
Chinese tallow	<i>Sapium sebiferum</i>	I
Cogon grass	<i>Imperata cylindrica</i>	I
Coral ardisia	<i>Ardisia crenata</i>	I
Golden bamboo	<i>Phyllostachys aurea</i>	II
Guinea grass	<i>Panicum maximum</i>	II
Guava	<i>Psidium guajava</i>	I
Japanese climbing fern	<i>Lygodium japonicum</i>	I
Lantana, shrub verbena	<i>Lantana camara</i>	I
Natal grass	<i>Rhynchelytrum repens</i>	I
Old World climbing fern	<i>Lygodium microphyllum</i>	I
Para grass	<i>Urochloa mutica</i>	I
Peruvian primrose willow	<i>Ludwigia peruviana</i>	I
Praxelis	<i>Praxelis clematidea</i>	II
Purple sesban	<i>Sesbania punicea</i>	II
Sword fern	<i>Nephrolepis cordifolia</i>	I
Torpedo grass	<i>Panicum repens</i>	I
Water hyacinth	<i>Eichhornia crassipes</i>	I
Water lettuce	<i>Pistia stratiotes</i>	I
Water spangles	<i>Salvinia minima</i>	I
Wild taro	<i>Colocasia esculenta</i>	I

- **Natural Community Descriptions**

- **Baygall (~284.7 acres)**

Baygall is a forested or shrub dominated community that occurs on muck rich hydric soils and typically receives its water inputs from ground water seepage. At the HHBCWMA this community can also develop in disturbed historic swamp communities. Winter fires can often burn into swamps when water is absent and cause muck fires and/or kill canopy cypress trees. Bay species often repopulate these fire disturbed areas more quickly than regenerating cypress and the community can transform into a baygall community. Many areas that currently contain a baygall vegetation assemblage appear as cypress swamps or open marsh/wet prairie habitats in the historic aerial photography. Once a baygall vegetation assemblage establishes, this community often resists prescribed fire and can spread to adjacent wetlands and to adjacent upslope flatwoods habitats. Growing season

prescribed fire is the best management tool for reducing non-historic baygall and maintaining a low and sparse structure of historic baygall habitats.

The canopy of the baygall community at the HHBCWMA is typically sparse on the perimeter of the community which is attributable to prescribed fire application. The canopy of this community often becomes denser and infrequently closed in the central portions of this habitat. Common canopy species typically include red maple, loblolly bay, sweetbay, swamp tupelo, slash pine, and pond cypress. Baygall at the HHBCWMA typically lacks a well formed subcanopy. Tall shrubs such as loblolly bay, dahoon, fetterbush, sweetbay, wax myrtle, and swamp bay form a dense tangle and compose the characteristic stratum of this natural community. Short shrubs are often found in dense cover percentages as well and are often on the ecotone of the community. Common short shrubs include gallberry, fetterbush, sweetbay, wax myrtle, swamp bay, and highbush blueberry. Vines such as laurel greenbrier, coral greenbrier, and muscadine are commonly found in the shrub stratum. Laurel wilt disease was evident in many habitats containing swamp bay. Herbaceous species are commonly sparse but are found in higher percentages on the perimeter of the baygall community. This community replaces surrounding wet prairie and wet flatwoods when prescribed fires have been ineffective at reducing woody establishment and growth. In these situations, the herbaceous layer often contains wet prairie species such as shortspike bluestem, tenangle pipewort, whitehead bogbutton, shortbristle horned beaksedge, and sugarcane plumegrass. On the interior of the community herbaceous species often include cinnamon fern, lizard's tail, sphagnum moss, netted chain fern, and Virginia chain fern.

- **Depression marsh (~967.0 acres)**

Depression marsh is an herbaceous wetland community with concentric zones of vegetation found in circular depressions. Depression marshes are commonly shallowly inundated with a gradual transition occurring between the surrounding community and the marsh center. The ecotone and often the center of the community will contain a diverse mixture of grasses and forbs that commonly carry fire. This characteristic often limits both tree and shrub establishment. Depression marshes that have been excluded from fire typically contain shrubby perimeters. The depression marsh communities present at the HHBCWMA commonly receive prescribed fire and have maintained their historic vegetation assemblage and open community structure.

At the HHBCWMA depression marsh is frequently found scattered through the flatwoods communities and is most often found without canopy trees or dense shrub cover. Shrubs are typically short and sparse and often include peelbark St. Johns wort, myrtleleaf St. Johns wort, water toothleaf, common buttonbush, and roundpod St. Johns wort.

The groundcover layer of this community often contains a dense and diverse herbaceous assemblage including blue maidencane, shortspike bluestem, longleaf threeawn, bottlebrush threeawn, wiregrass, sawgrass, dwarf sundew, pink sundew, flattened

pipewort, pipewort, Carolina redroot, maidencane, pickerelweed, shortbristle horned beaksedge, sugarcane plume grass, hooded pitcherplant, sand cordgrass, saltmeadow cordgrass, Virginia chain fern, and fringed yellow-eyed grass.

Canopy trees are typically very sparse in this habitat, but can be present in areas that have not received effective prescribed fire applications. The presence of trees in this community's canopy increases closer to floodplain areas. Red maple, swamp tupelo, slash pine, cabbage palm, and pond cypress are the common canopy associates in fire excluded areas. Likewise, shrub heights and covers increase with closer proximity to the floodplain systems. In these areas, less desirable depression marsh shrubs can be found including groundsel tree, sweetbay, wax myrtle, slash pine, coastalplain willow, and pond cypress.

- **Dome Swamp (~1,428.9 acres)**

Dome swamp is an isolated wetland community occurring in shallow basins within a fire-maintained community and is forested with conifers and/or deciduous trees. Fire occurs along the periphery, spreading from the surrounding uplands, but is infrequent in the deeper portions of the swamp due to decreased fuels and wetter conditions. Trees in the center are generally taller than those on the edges, giving the stand its characteristic dome-shaped profile. Dome Swamps at the HHBCWMA are frequently scattered across the property within the flatwoods matrix. This community occurs in a wide variety of shapes and sizes and typically burns along with the surrounding pyrogenic community. Often the ecotone of this community contains a wet prairie or marsh habitat characterized by herbaceous species, primarily graminoids. In some instances, historic dome swamps that appear to have been dominated by cypress are currently colonized by baygall species. This is typically due to past fire disturbance. Winter burning when groundwater levels are too low can burn into the muck soils that accumulate in dome swamps. The burning of this muck can kill the canopy cypress trees and allow for baygall species to establish. Increased shrub fuel loads in fire excluded dome swamps can also cause this community to burn too hot, thus also killing the historic cypress canopy.

The majority of the dome swamp communities at the HHBCWMA contain younger mature to mature canopies. Pond cypress is the dominant canopy species, with red maple loblolly bay and swamp bay commonly occurring in many of the larger swamps. This community generally lacks a distinct subcanopy. Shrub covers vary depending on location, but shrubs are generally sparse to moderately dense. Common shrub species include loblolly bay, dahoon, gallberry, fetterbush, and, wax myrtle. The herbaceous layer of the dome swamp community commonly includes chalky bluestem, big carpetgrass, toothed midsorus fern, cinnamon fern, netted chain fern and Virginia chain fern. Epiphytes are fairly common in the dome swamp community and often include Balbis' airplant, common wild-pine, Florida air-plant, and Spanish moss.

- **Dry Prairie (~527.5 acres)**

Dry prairies are upland areas of dwarf shrubs and grasses with few or no pines and many of the same species in the shrub and herbaceous layers as are found in a mesic flatwoods community. At the HHBCWMA, wiregrass, low shrubs, stunted saw palmetto and dwarf live oak form most of the cover, with taller shrubs being infrequent to absent. Due to past fire history and applied roller chopping techniques, dry prairie is often difficult to discern from mesic flatwoods. Roller chopped mesic flatwoods commonly has very low structured shrub layer that appears to be stunted and is very similar in structure to a dry prairie habitat. Areas of dry prairie that have not received sufficient prescribed fire have excessively tall shrubs and/or canopy pines. These areas are difficult to impossible to differentiate from historic flatwoods. Historic aerial photography is useful in the delineation of these two similar habitats but may not show or represent true historic conditions. Dry prairie at the HHBCWMA tends to occur adjacent to scrubby flatwoods habitats. Frequent fires are necessary to prevent the establishment of a longleaf pine canopy in this community. In fire excluded areas of this community sparse sand live oak and live oak are present. Short shrubs form the characteristic stratum of this community. Commonly shrubs are less than one meter tall and include netted pawpaw, Atlantic St. Johns wort, fourpetal St. Johns wort, gallberry, gopher apple, coastalplain staggerbush, fetterbush, wax myrtle, dwarf wax myrtle, wild pennyroyal, dwarf live oak, runner oak, saw palmetto, and shiny blueberry. Herbaceous cover is variable and is commonly sparse to moderately dense. Characteristic dry prairie herbaceous species at the HHBCWMA include bottlebrush threeawn, wiregrass, witchgrass skeletongrass, fringed yellow stargrass, whitehead bogbutton, shortleaf gayfeather, narrowleaf silkgrass, blackroot, little bluestem, sweet goldenrod, lopsided indiagrass, and Carolina yellow-eyed grass.

- **Floodplain Swamp (~2,853.0 acres)**

Floodplain Swamp is a hydric forested community that occurs within the floodplain of a creek, stream, or river. This community at the HHBCWMA occurs along its namesake Bull Creek, Crabgrass Creek, and their various tributaries. Floodplain swamp, hydric hammock, and black water stream communities together create a varied mosaic within the canopied floodplain systems of this site. Hydric hammock is typically separated from floodplain swamp by containing a predominance of cabbage palm and live oak and is typically saturated, rather than inundated. Floodplain swamp becomes more common to the south as the floodplain system accumulates greater amounts of water inputs. The canopy of this community is typically dominated by cypress. The flood control structures associated with Bull Creek have severe effects on floodplain swamp community by creating unnaturally high water depths and long hydroperiods that reduce vegetation cover in all strata. Canopy trees are typically the only vegetation component that can tolerate such inundation. The central and southern portions of the Bull Creek floodplain on the HHBCWMA are the most severely flood impacted areas.

The floodplain swamp community at the HHBCWMA is commonly a closed canopy system. In areas that are excessively inundated the canopy is generally sparse and unhealthy. Common canopy associates include red maple, sweetgum, swamp tupelo, swamp laurel oak, pond cypress, bald cypress, and American elm. The subcanopy contains younger individuals found in the canopy layer in addition to Carolina ash and cabbage palm. Epiphytes are common in the canopy layer and include resurrection fern, common wild-pine, and ballmoss. The shrub layer is very sparse due to shading provided by the canopy layers. Common shrubs include common buttonbush, Virginia willow, water locust, wax myrtle, cabbage palm, coastalplain willow, and Walter's viburnum. The herbaceous layer density is directly related to the depth of water commonly present in this community with more cover in less inundated situations. Herbaceous layer associates include toothed midsorus fern, false nettle, hop sedge, manyflower marsh pennywort, prairie iris, cardinal flower, cinnamon fern, dotted smartweed, shortbristle horned beaksedge, swamp dock, coastal rosegiant, sugarcane plumegrass, pineland pimpernel, lizard's tail, Canadian germander, alligatorflag, hottentot fern, eastern poison ivy, and Virginia chain fern.

- **Hydric Hammock (~1,179.5 acres)**

Hydric Hammock is a forested community with saturated soils that commonly supports a canopy of live oak and cabbage palm. At the HHBCWMA this community occurs intermixed in a mosaic with floodplain swamp. These two communities and blackwater stream compose the floodplain habitats at the HHBCWMA. Small drainages that originate in the pyrogenic communities at this site typically coalesce down gradient and when they collect enough water to exclude fire, hydric hammock develops.

Hydric hammocks at the HHBCWMA are forested wetlands with a canopy of hardwoods, usually including swamp laurel oak and cabbage palm, often occurring along edges of floodplains or swamps. At the HHBCWMA this community is well developed, consisting of a tall forest of mature trees occurring along Bull Creek, Crabgrass Creek and its tributaries. The diverse, closed canopy consists of five equally abundant tree species, including swamp laurel oak, red maple, sweetbay magnolia, and American elm. Cabbage palm is common in the subcanopy and also in the tall shrub layer. Wax myrtle is also frequent in the tall shrub layer, which is usually sparse. The short shrub layer is also sparse and consists primarily of blue palmetto. Two tropical species, twinberry and wild coffee, are found at a few sites in the tall and short shrub layers, respectively. The herbaceous layer is usually sparse, with occasional dense patches of ferns which include cinnamon fern, netted chain fern, Virginia chain fern, hottentot fern, and marsh fern. Epiphytes are abundant, including bromeliads, ferns and an orchid. Mesic hammock or a pine dominated hydric hammock habitat form the ecotone between hydric hammock and the open flatwoods matrix. Fire appears to be very infrequent in the hydric hammock community.

- **Mesic Flatwoods (~11,805.4 acres)**

Mesic flatwoods are an upland forest community with an open pine canopy and an understory composed of varying mixtures of shrubs and grasses. At the HHBCWMA mesic flatwoods typically contains a sparse canopy of longleaf pine or slash pine. Pine canopies are often very sparse when adjacent to scrubby flatwoods, scrub and prairie communities and much denser when grading down slope towards hammock communities.

Shrubs are primarily represented by saw palmetto but may also include coastalplain staggerbush, fetterbush, wax myrtle, Atlantic St. Johns wort, gallberry, dwarf wax myrtle, dwarf live oak, and shiny blueberry. Due to frequent prescribed fire applications, shrubs are commonly short and form a well-structured flatwoods habitat. Wiregrass is the common herbaceous species observed in the mesic flatwoods community. Associated species are broomsedge bluestem, bottlebrush threeawn, witchgrass, tall elephantsfoot, blackroot, little bluestem, and lopsided indiagrass. Vines were typically sparse to nonexistent in mesic flatwoods at the HHBCWMA.

In the 1944 aerial photography scattered bare patches of sand can be observed, while trees are generally absent. This might be the result of stump removal for the turpentine industry of the early and middle 19th century. Some of the area classified as historic mesic flatwoods may have been historic dry prairie communities. Due to past fire history and applied roller chopping techniques dry prairie is often difficult to discern from mesic flatwoods. Roller chopped mesic flatwoods commonly has very low structured shrub layer that appears to be stunted and is very similar in structure to a dry prairie habitat. Areas of dry prairie that have not received sufficient prescribed fire have excessively tall shrubs and/or canopy pines. These areas are difficult to impossible to differentiate from historic flatwoods. Historic aerial photography is useful in the delineation of these two similar habitats but may not show or represent true historic conditions.

- **Mesic Hammock (~176.4 acres)**

Mesic hammocks are closed-canopy forests of temperate hardwood species occurring along wetlands or as islands within wetlands where they are sheltered from fire. Fire is rare, and when mesic hammocks burn they may convert to the community they border. Mesic hammocks at the HHBCWMA have formed in both fire-shadowed sites and areas that were historically cleared or developed. Mesic hammock is best represented by a closed or nearly closed canopy community of live oak that is occurring on well drained sands. This community can also be found intermixed with hydric hammock on higher rises within the floodplain systems of the HHBCWMA. Disturbances to the flatwoods community at the HHBCWMA are relatively few and prescribed fire is regularly used to maintain its pyrogenic communities. These two factors minimize the amount of lands that could succeed to mesic hammock.

The canopy of mesic hammock is commonly closed and consists of primarily live oak and additionally sweetgum, southern magnolia, slash pine, swamp laurel oak, water oak, and cabbage palm. Cabbage palm is also common in the shrub stratum with yaupon, American beautyberry, fetterbush, wax myrtle, coastalplain staggerbush, water oak, and saw palmetto. Herbaceous species are commonly sparse or not present. Herbaceous species found in mesic hammock at the HHBCWMA include witchgrass, bracken fern, and sandyfield beaksedge. The canopy live oaks of this community frequently hold numerous epiphytes including golden polypody, resurrection fern, common wild-pine, ballmoss, southern needleleaf, Florida air-plant, Spanish moss, spreading air-plant, and shoestring fern. Vines such as earleaf greenbrier and muscadine are commonly found in this habitat.

- **Sandhill (~4.6 acres)**

Sandhill is characterized by a canopy of widely spaced pine trees with a sparse midstory of deciduous oaks, and a moderate to dense groundcover of grasses, herbaceous, and low shrubs occurring over a rolling topography composed of deep sands. The HHBCWMA contains only one small 4.6 acre area of sandhill. This community contains all the components needed to be classified as high quality, despite its minimal size. The open canopy contains mature longleaf pine with a sparse subcanopy of turkey oak. Shrubs are also sparse and represented by sand live oak, turkey oak, gopher apple, dwarf live oak, live oak, saw palmetto, shiny blueberry, and deerberry. The herbaceous layer is fairly dense and contains mostly wiregrass and to a less extent coastalplain chaffhead, narrowleaf silkgrass, blackroot, and snoutbean. Open areas of bare sand can be found throughout.

- **Scrub (~159.3 acres)**

Scrub is a xeric woodland that occurs on well drained sand soils and supports a vegetation assemblage characterized by scrub oaks. This community burns infrequently relative to the typical flatwoods matrix it is formed within. The majority of the scrub found at the HHBCWMA lacks any canopy stratum and is best characterized by 6-15 ft. tall scrub oaks intermixed with sandy openings. The openings allow the rare large-flowered rosemary and nodding pinweed to persist in the sparse ground cover. The scrub community often occurs in isolated islands within the flatwoods communities. This landscape position maximizes the opportunity for fire to enter this community. Many areas of scrub on the HHBCWMA have been identified as reference natural communities for Florida by the FNAI for their exceptional open and low shrub structure. These sites, as identified in the supporting ground-truthed data, are representative of historical community conditions. Areas that have been excluded from prescribed fire may contain canopy associates including sand pine, slash pine, and longleaf pine. Sand pine scrub is not common at this site and the majority of this community is best classified as the oak scrub variant. Tall shrubs are often present and are moderately dense and intermixed with open areas of bare sand. Tall shrubs include rusty staggerbush, coastalplain staggerbush, fetterbush, sand pine, Chapman's oak, sand live oak, and myrtle oak. These same species can be found in the short shrub layer in addition to Florida rosemary, Atlantic St. Johns wort, gopher apple, dwarf live oak, saw

palmetto, shiny blueberry, and deerberry. Herbaceous species are commonly sparse, which is typical for this community. Two rarities present in groundcover stratum of scrub at the HHBCWMA are large-flowered rosemary and nodding pinweed. The presence of these species indicates the high quality of the herbaceous layer. Other common groundcover species include arrowfeather threeawn, coastalplain honeycomb-head, Ware's hairsedge, coastalplain chaffhead, flatsedge, witchgrass, Elliott's milkpea, southern bogbutton, October flower, sandyfield beaksedge, and sand spike moss. Epiphytes are fairly common in this community on scrub oaks. Commonly documented epiphytes include ballmoss and Spanish moss. Vines were infrequent and represented by one species, earleaf greenbrier.

- **Scrubby Flatwoods (~959.1 acres)**

Scrubby flatwoods at the HHBCWMA occurs in association with the mesic flatwoods and scrub communities on the property. Scrubby flatwoods contain scrub oaks but differ from scrub by having a greater percent cover of saw palmetto and herbaceous groundcover species, and by typically having a canopy of longleaf pine. In addition to the herbaceous layer, the pines add fine fuel to the system in the form of needle drop. This helps this community carry fire more frequently and effectively than pure oak-dominated scrub. Also, the scrubby flatwoods community often occurs in isolated islands within the mesic flatwoods matrix at the HHBCWMA. This landscape position maximizes the opportunity for fire to enter this community. Many areas of scrubby flatwoods on the HHBCWMA have been identified as reference natural communities for Florida by the FNAI for their exceptional open and low shrub structure and canopy age. These sites, as identified in the supporting ground-truthed data, are representative of historical community conditions.

Longleaf pine is the dominant canopy species, while sand pine, slash pine, and sand live oak are found much less frequently in the canopy layer. Tall shrubs are common and vary in densities from one stand to another. Common tall shrub species include tarflower, rusty staggerbush, coastalplain staggerbush, fetterbush, Chapman's oak, sand live oak, myrtle oak, cabbage palm, saw palmetto, and deerberry. The short shrub layer often contains the same species in addition to netted pawpaw, dwarf huckleberry, Atlantic St. Johns wort, fourpetal St. Johns wort, gopher apple, dwarf wax myrtle, pricklypear, wild pennyroyal, dwarf live oak, winged sumac, shiny blueberry, and Adam's needle. Herbaceous species are typically sparse, which is common for this community. Wiregrass is the dominant herbaceous species. Addition groundcover associates include arrowfeather threeawn, bottlebrush threeawn, wiregrass, coastalplain honeycomb-head, Ware's hairsedge, coastalplain chaffhead, witchgrass, tall elephantsfoot, wedge-leaved button-snakeroot, Elliott's milkpea, blazing star, skyblue lupine, narrowleaf silkgrass, candyroot, October flower, largeflower jointweed, rustweed, bracken fern, blackroot, sandyfield beaksedge, little bluestem, sweet goldenrod, lopsided indianguass, queen's delight, and Carolina yellow-eyed grass. Vines are uncommon but may include small percentages of earleaf greenbrier and muscadine.

- **Wet Flatwoods (~2,058.6 acres)**

Wet flatwoods typically have an open pine canopy with an understory of hydrophytic herbaceous species and shrubs. Wet flatwoods that burn frequently typically have a sparse understory and a dense complement of herbaceous and smaller shrubs species. Conversely, thick, shrubby understory layers tend to suppress ground cover plants.

Wet flatwoods at the HHBCWMA occurs in two unique forms. The first subtype is generally in line with typical wet flatwoods landscape positioning, structure, and species composition. This community can be described as a mosaic of wet prairie interspersed with small mesic flatwoods islands that are dominated by saw palmetto and occasional pines. The mix of mesic flatwoods and wet prairie is often not easily represented in map form and is best lumped into a wet flatwoods classification. Often times with exclusion of fire, wet prairie can become invaded by pines. These areas, if thought not to be historically wet flatwoods, were not classified as such. Regardless of canopy densities, these areas were typed as wet prairie in order to guide management towards a prairie condition, rather than a canopied system. Typical wet flatwoods situations contain a sparse to moderately dense canopy of longleaf pine. The subcanopy is often absent, but when present includes red maple, cabbage palm, and pond cypress. Shrubs are often very sparse but can be dense in fire excluded areas. Common shrubs include buttonbush, gallberry, fetterbush, wax myrtle, slash pine, cabbage palm, saw palmetto, roundpod St. Johns wort, and peelbark St. Johns wort. Herbaceous species are often very diverse, and the dominant species often include bottlebrush threeawn, wiregrass, pineland daisy, pink sundew, maidencane, shortbristle horned beaksedge, sugarcane plumegrass, and bog white violet.

The second subtype of wet flatwoods at the HHBCWMA occurs on low lying elevations that occur between floodplain systems and mesic flatwoods habitats. These areas appear to receive infrequent floodwater inputs and commonly contain more organic soils than sandy flatwoods soils. These habitats are impacted by additional unnatural flooding events caused by water manipulation devices located on the eastern side of the the HHBCWMA. The results of such flooding limit species diversity and only allow for species that are able to persist after flooding events. The frequent presence of cabbage palm in this habitat also indicates less acidic and/or lime rich soils. Longleaf pine is replaced by slash pine in the canopy of this wet flatwoods variant which is referred to as a “cabbage palm flatwoods” (FNAI, 2010). Additional canopy species occurring in this variant of wet flatwoods include sweetgum, red maple, live oak, and cabbage palm. Shrubs are generally sparse to moderately dense and kept in check by flooding impacts and prescribed fire applications. Common shrubs in the cabbage palm variant include common buttonbush, common persimmon, dahoon, fetterbush, wax myrtle, coastalplain willow, saw palmetto, roundpod St. Johns wort, peelbark St. Johns wort, St. Andrew's cross, and gallberry. Herbaceous species are much less diverse than the more typical wet flatwoods situations. Common herbaceous species include blue maidencane, shortspike bluestem, bushy bluestem, chalky bluestem, spadeleaf, sawgrass, slender flattop goldenrod, clustered bushmint, maidencane, and Virginia chain fern.

This community often occurs interspersed with mesic flatwoods that is dominated by slash pine and saw palmetto. Cabbage palm wet flatwoods and mesic flatwoods found in low lying areas adjacent to the floodplain communities of the HHBCWMA are typically not distinguishable from one another on aerial photography. These communities are best classified as a mosaic of the two.

- **Wet Prairie (~577.2 acres)**

Wet prairie is a wetland herbaceous community characterized by a seasonally high water table and frequent fire, with dense stands of grass species intermingled with high quality wetland herbaceous species. At the HHBCWMA, wet prairie commonly borders dome swamps and depression marshes. In most cases, these bordering prairie-like areas are small and often included as part of the community they fringe. Wet prairie may also form irregular and sometimes large patches within a mesic flatwoods matrix. These habitats commonly contain rounded “islands” of saw palmetto scattered throughout. In areas that have been disturbed in the past, wiregrass may be replaced as the dominant species by shortspike bluestem. Wiregrass requires fire to reproduce; many of the herbaceous species that are growing with it require fire to flower or have their flowering enhanced by fire. In the absence of fire, wet prairies are readily invaded by wax myrtle, and the height and cover of the latter is an indicator of past fire history in any given stand. A few areas of wet prairie at the HHBCWMA occur in linear drainages that terminate into lower elevation hydric hammock. These areas are created by seepage rather than pooling of water. This character maintains constant hydrology levels and often supports rare and unique vegetation associations, such as pitcher plant prairies. Hooded pitcherplant is commonly observed in most areas of wet prairie. Many wet prairie habitats on the HHBCWMA are very small and fall below the minimum mapping unit adopted by the FWC (> 0.5 acres).

Wet prairie at the HHBCWMA typically lacks a canopy or contains only a few scattered longleaf pines. In areas that have been disturbed, commonly from hydrology alterations, slash pine can be a common invader. Shrubs are sparse and include roundpod St. Johns wort, peelbark St. Johns wort, myrtleleaf St. Johns wort, fourpetal St. Johns wort, gallberry, fetterbush, wax myrtle, dwarf live oak, saw palmetto, and pond cypress. This community contains a very diverse suite of herbaceous species commonly dominated by wiregrass and to a lesser extent blue maidencane, longleaf threeawn, bottlebrush threeawn, pineland rayless goldenrod, bearded grass-pink, pineland daisy, toothache grass, woolly witchgrass, dwarf sundew, pink sundew, early whitetop fleabane, flattened pipewort, tenangle pipewort, whitehead bogbutton, water cowbane, orange milkwort, sugarcane plumegrass, and bog white violet. Vines are generally present in fire excluded wet prairies and may include earleaf greenbrier, laurel greenbrier, and muscadine.

- **Altered Community Descriptions**

- **Pasture - Improved (~25.9 acres)**

Improved pastures are defined as natural areas that have been stripped of most or all native vegetation and replanted in pasture grasses. At the HHBCWMA, improved pasture accounts for only 26 acres of the entire site. There is only one example of this anthropogenic ecological community occurring in the extreme southwest corner of the property. This community has heavy disturbance from cattle, clearing and exotic plant establishment. This community lacks canopy trees but does contain scattered wax myrtle shrubs. No native vegetation is evident and dogfennel and bahiagrass dominate the groundcover.

- **Pasture – Semi-Improved (~1.7 acres)**

Semi-improved pasture is defined as natural areas that have been stripped of a significant percentage of their native vegetation and seeded in pasture grasses, but still retain some natural structure. Semi-improved pasture at the HHBCWMA occurs in one area of former scrubby flatwoods. This site contains a canopy of sand live oak and live oak. Shrubs are locally dense or have been removed and replaced with open areas of bahiagrass. Shrub species include sour orange, saw palmetto, Chapman's oak, sand live oak, and cabbage palm.

- **Pine Plantation (~8.8 acres)**

Pine plantation at the HHBCWMA is defined as densely planted pines occurring in rows and lacking a significant or diverse assemblage of groundcover/ herbaceous species. The HHBCWMA contains one occurrence of pine plantation that is located in the extreme southwestern portion of the property. Prior to acquisition by the state of Florida, slash pine was planted in rows on what was historically mesic flatwoods. This community lacks both subcanopy and tall shrub strata. Short shrubs are sparse to moderately dense with generally low shrub heights. Short shrub species include gallberry, fetterbush, saw palmetto, and sparkleberry. The herbaceous layer is very sparse and species poor. Bluestem, slender flattop goldenrod, crowngrass, bracken fern, blackroot, and queen's delight are the only noted herbaceous species. This community has received numerous applications of prescribed fire and with the exception of fairly dense pines in the canopy this community has decent vegetation structure.

- **Ruderal (~459.5 acres)**

Ruderal communities are areas where the natural community has been overwhelmingly altered as a result of human activity. Seven ruderal types were mapped on the HHBCWMA: clearing, ditch/canal, agriculture, developed, impoundment/artificial pond, spoil area and abandoned field. The largest and most significant ruderal feature of the

HHBCWMA is the flood control berm and associated water control devices. This feature alters the natural hydroperiod of the adjacent floodplain swamp and hydric hammock mosaic associated with Bull Creek.

- **Fish and Wildlife**

In association with the varied assemblage of natural communities described above, a rich diversity of wildlife species is found on the HHBCWMA. The FWC maintains an inventory of wildlife that occurs on the HHBCWMA. These species include mammals (Table 7), birds (Table 8), reptiles and amphibians (Table 9), and exotic animals (Table 10). These inventories are ongoingly updated by FWC biologists.

Table 7. Mammal species observed at the HHBCWMA.

Common name	Scientific name
Bobcat	<i>Lynx rufus</i>
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>
Cotton mouse	<i>Peromyscus gossypinus</i>
Coyote	<i>Canis latrans</i>
Eastern cottontail rabbit	<i>Sylvilagus floridanus</i>
Eastern gray squirrel	<i>Sciurus carolinensis</i>
Eastern mole	<i>Scalopus aquaticus</i>
Evening bat	<i>Nycticeius humeralis</i>
Feral hog	<i>Sus scrofa</i>
Florida black bear	<i>Ursus americana floridanus</i>
Florida panther	<i>Puma concolor</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Long-tailed weasel	<i>Mustela frenata</i>
Marsh rabbit	<i>Sylvilagus palustris</i>
Marsh rice rat	<i>Oryzomys palustris</i>
Nine-banded armadillo	<i>Dasypus novemcinctus</i>
Northern yellow bat	<i>Lasiurus intermedius</i>
Raccoon	<i>Procyon lotor</i>
River otter	<i>Lutra canadensis</i>
Seminole bat	<i>Lasiurus seminolus</i>
Sherman's fox squirrel	<i>Sciurus niger shermani</i>
Short-tailed shrew	<i>Blarina carolinensis</i>
Southern flying squirrel	<i>Glaucomys volans</i>
Spotted skunk	<i>Spilogale putorius</i>
Striped skunk	<i>Mephitis mephitis</i>
Tricolored bat	<i>Perimyotis subflavus</i>
Virginia opossum	<i>Didelphis virginiana</i>
White-tailed deer	<i>Odocoileus virginianus</i>

Table 8: Bird species observed at the HHBCWMA.

Common name	Scientific name
Acadian flycatcher	<i>Empidonax virescens</i>
American bittern	<i>Botaurus lentiginosus</i>
American coot	<i>Fulica americana</i>
American crow	<i>Corvus brachyrhynchos</i>
American goldfinch	<i>Carduelis tristis</i>
American kestrel	<i>Falco sparverius</i>
American pipit	<i>Anthus rubescens</i>
American redstart	<i>Setophaga ruticilla</i>
American robin	<i>Turdus migratorius</i>
American woodcock	<i>Scolopax minor</i>
Anhinga	<i>Anhinga anhinga</i>
Bachman's sparrow	<i>Aimophila aestivalis</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Baltimore oriole	<i>Icterus galbula</i>
Barn owl	<i>Tyto alba</i>
Barn swallow	<i>Hirundo rustica</i>
Barred owl	<i>Strix varia</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Black vulture	<i>Coragyps atratus</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Black-bellied plover	<i>Pluvialis squatarola</i>
Black-bellied whistling duck	<i>Dendrocygna autumnalis</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Blackpoll warbler	<i>Dendroica striata</i>
Black-throated blue warbler	<i>Dendroica caerulescens</i>
Blue jay	<i>Cyanocitta cristata</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Blue-headed vireo	<i>Vireo solitarius</i>
Boat-tailed grackle	<i>Quiscalus major</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Cattle egret	<i>Bubulcus ibis</i>
Chimney swift	<i>Chaetura pelagica</i>
Chuck-wills'-widow	<i>Caprimulgus carolinensis</i>
Common grackle	<i>Quiscalus quiscula</i>
Common ground dove	<i>Columbina passerina</i>
Common moorhen	<i>Gallinula chloropus</i>
Common nighthawk	<i>Chordeiles minor</i>

Common snipe
Common yellowthroat
Cooper's hawk
Crested caracara
Double crested cormorant
Downy woodpecker
Eastern bluebird
Eastern kingbird
Eastern meadowlark
Eastern phoebe
Eastern screech-owl
Eastern towhee
European starling
Fish crow
Florida sandhill crane
Glossy ibis
Gray catbird
Great blue heron
Great egret
Great horned owl
Great-crested flycatcher
Greater yellowlegs
Green heron
Hooded merganser
House sparrow
House wren
Killdeer
King rail
Laughing gull
Le Conte's sparrow
Least bittern
Least sandpiper
Lesser yellowlegs
Limpkin
Little blue heron
Loggerhead shrike
Magnolia warbler
Mallard
Merlin
Mottled duck
Mourning dove
Northern bobwhite
Northern cardinal
Northern flicker

Gallinago gallinago
Geothlypis trichas
Accipiter cooperii
Polyborus plancus
Phalacrocorax auritus
Picoides pubescens
Sialia sialis
Tyrannus tyrannus
Sturnella magna
Sayornis phoebe
Otus asio
Pipilo erythrophthalmus
Sturnus vulgaris
Corus ossifragus
Grus canadensis pratensis
Plegadis falcinellus
Dumetella carolinensis
Ardea herodias
Ardea alba
Bubo virginianus
Myiarchus crinitus
Tringa melanoleuca
Butorides virescens
Lophodytes cucullatus
Passer domesticus
Troglodytes aedon
Charadrius vociferus
Rallus elegans
Larus atricilla
Ammodramus leconteii
Ixobrychus exilis
Calidris minutilla
Tringa flavipes
Aramus guarauna
Egretta caerulea
Lanius ludovicianus
Dendroica magnolia
Anas platyrhynchos
Falco columbarius
Anas fulvigula
Zenaida macroura
Colinus virginianus
Cardinalis cardinalis
Colaptes auratus

Northern harrier	<i>Circus cyaneus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Northern parula	<i>Parula americana</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Osprey	<i>Pandion haliaetus</i>
Palm warbler	<i>Dendroica palmarum</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Pine siskin	<i>Carduelis pinus</i>
Pine warbler	<i>Dendroica pinus</i>
Prairie warbler	<i>Dendroica discolor</i>
Purple martin	<i>Progne subis</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-breasted merganser	<i>Mergus serrator</i>
Red-cockaded woodpecker	<i>Picoides borealis</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Ring-billed gull	<i>Larus delawarensis</i>
Rock dove	<i>Columba livia</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Ruby-throated hummingbird	<i>Archilochus colubris</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Short-tailed hawk	<i>Buteo brachyurus</i>
Snowy egret	<i>Egretta thula</i>
Sora	<i>Porzana carolina</i>
Summer tanager	<i>Piranga rubra</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Swallow-tailed kite	<i>Elanoides forficatus</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Tree swallow	<i>Tachycineta bicolor</i>
Tricolored heron	<i>Egretta tricolor</i>
Tufted titmouse	<i>Baeolophus bicolor</i>
Turkey vulture	<i>Cathartes aura</i>
Veery	<i>Catharus fuscescens</i>
Virginia rail	<i>Rallus limicola</i>
Western sandpiper	<i>Calidris mauri</i>
White ibis	<i>Eudocimus albus</i>
White-eyed vireo	<i>Vireo griseus</i>
Wild turkey	<i>Meleagris gallopavo</i>
Willet	<i>Catoptrophorus semipalmatus</i>

Wood duck	<i>Aix sponsa</i>
Wood stork	<i>Mycteria americana</i>
Worm-eating warbler	<i>Helmitheros vermivorum</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Yellow-crowned night-heron	<i>Nyctanassa violaceus</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>
Yellow-throated warbler	<i>Dendroica dominica</i>

Table 9. Reptiles and Amphibians species observed at the HHBCWMA.

Common name	Scientific Name
American alligator	<i>Alligator mississippiensis</i>
Barking treefrog	<i>Hyla gratiosa</i>
Broadhead skink	<i>Eumeces laticeps</i>
Brown anole	<i>Anolis sagrei</i>
Brown water snake	<i>Nerodia taxispilota</i>
Corn snake	<i>Pantherophis guttatus guttatus</i>
Cuban treefrog	<i>Osteopilus septentrionalis</i>
Dusky pigmy rattlesnake	<i>Sistrurus miliarius barbouri</i>
Eastern coachwhip	<i>Masticophis flagellum</i>
Eastern coral snake	<i>Micrurus fulvius fulvius</i>
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>
Eastern garter snake	<i>Thamnophis sirtalis sirtalis</i>
Eastern glass lizard	<i>Ophisaurus ventralis</i>
Eastern hognose	<i>Heterodon platyrhinos</i>
Eastern indigo snake	<i>Drymarchon corais couperi</i>
Eastern mud snake	<i>Farancia abacura abacura</i>
Eastern narrowmouth toad	<i>Gastrophryne carolinensis</i>
Florida box turtle	<i>Terrapene carolina bauri</i>
Florida brown snake	<i>Storeria victa</i>
Florida chicken turtle	<i>Deirochelys reticularia chrysea</i>
Florida chorus frog	<i>Pseudacris nigrita verrucosa</i>
Florida cottonmouth	<i>Agkistrodon piscivorous conanti</i>
Florida cricket frog	<i>Acris gryllus dorsalis</i>
Florida gopher frog	<i>Rana areolata</i>
Florida green water snake	<i>Nerodia floridana</i>
Florida redbelly turtle	<i>Pseudemys nelsoni</i>
Florida snapping turtle	<i>Chelydra serpentina osceola</i>
Florida softshell turtle	<i>Apalone ferox</i>
Florida water snake	<i>Nerodia fasciata pictiventris</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
Greater siren	<i>Siren lacertina</i>

Green anole	<i>Anolis carolinensis</i>
Green treefrog	<i>Hyla cinerea</i>
Greenhouse frog	<i>Eleutherodactylus planirostris</i>
Ground skink	<i>Scincella lateralis</i>
Indo-Pacific gecko	<i>Hemidactylus garnotii</i>
Island glass lizard	<i>Ophisaurus compressus</i>
Little grass frog	<i>Pseudacris ocularis</i>
Narrow-striped dwarf siren	<i>Psuedobrachius axanthus axanthus</i>
Oak toad	<i>Bufo quercicus</i>
Peninsula cooter	<i>Pseudemys peninsularis</i>
Peninsula ribbon snake	<i>Thamnophis sauritus sackeni</i>
Pig frog	<i>Rana grylio</i>
Pine woods snake	<i>Rhadinaea flavilata</i>
Pinewoods treefrog	<i>Hyla femoralis</i>
Scarlet kingsnake	<i>Lampropeltis triangulum elapsoides</i>
South Florida swamp snake	<i>Seminatrix pygaea cyclas</i>
Southeastern five-lined skink	<i>Eumeces inexpectatus</i>
Southern black racer	<i>Coluber constrictor priapus</i>
Southern cricket frog	<i>Acris gryllus gryllus</i>
Southern leopard frog	<i>Lithobates sphenocephalus</i>
Southern ringneck snake	<i>Diadophis punctatus punctatus</i>
Southern toad	<i>Bufo terrestris</i>
Striped crayfish snake	<i>Regina alleni</i>
Striped mud turtle	<i>Kinosternon baurii</i>
Squirrel treefrog	<i>Hyla squirella</i>
Two-toed amphiuma	<i>Amphiuma means</i>
Yellow rat snake	<i>Elaphe obsoleta quadrivittata</i>

Table 10: Exotic Animal Species Found at the HHBCWMA

Common name	Scientific name
Feral hog	<i>Sus scrofa</i>
European starling	<i>Sturnus vulgaris</i>
Brown anole	<i>Anolis sagrei</i>
Cuban treefrog	<i>Osteopilus septentrionalis</i>
Greenhouse frog	<i>Eleutherodactylus planirostris</i>
Indo-Pacific gecko	<i>Hemidactylus garnotii</i>

- Integrated Wildlife Habitat Ranking System**

The FWC has developed the Integrated Wildlife Habitat Ranking System (IWHRS) as a Geographic Information Systems (GIS)-based assessment tool that incorporates a wide variety of land cover and wildlife species data. The IWHRS evaluates the Florida landscape

based upon the habitat needs of wildlife as a way to identify ecologically significant lands in the state, and to assess the potential impacts of management and land-use changes. The IWHRS was developed to provide technical assistance to various local, regional, state, and federal agencies, and entities interested in wildlife needs and conservation in order to: (1) determine ways to avoid or minimize project impacts by evaluating alternative placements, alignments, and transportation corridors during early planning stages, (2) assess direct, secondary, and cumulative impacts to habitat and wildlife resources, and (3) identify appropriate parcels for public land acquisition for wetland and upland habitat mitigation purposes. The IWHRS (2009) indicates that the HHBCWMA has a mean wildlife value of 8.1. The FWC's IWHRS map for the HHBCWMA is shown in Figure 10.

- **Rare and Imperiled Species**

As described above, the HHBCWMA has a variety of natural communities and habitat types that support a wide array of imperiled, rare, and more common wildlife species. Active wildlife management practices and the high quality of habitat make the HHBCWMA an excellent place to view wildlife. The HHBCWMA's mixed hardwood forests, wet and mesic flatwoods and other communities provide critical habitat for resident and migratory wildlife.

Table 11 lists the imperiled wildlife species that have been documented as occurring on or in the vicinity of the HHBCWMA. Figure 7 displays FWC wildlife observations and FNAI element occurrences that have been documented within the HHBCWMA. Eight imperiled animal species have been documented at the HHBCWMA.

At its November, 2016, Commission meeting, the FWC approved Florida's Imperiled Species Management Plan (<http://myfwc.com/wildlifehabitats/imperiled/plan/>), which included changes to the listing status for many wildlife species. Subsequent rule changes (68A-27.003 and 68A-27.005 FAC) reflecting changes came into effect in January, 2017. All federally listed species that occur in Florida are included in Florida's Endangered and Threatened Species list (<http://myfwc.com/media/1515251/threatened-endangered-species.pdf>) as federally-designated Endangered or federally-designated Threatened. Species that are not federally listed, but which have been identified by FWC as being at some level of risk of extinction, are listed as state-designated Threatened. Additionally, the FWC continues to maintain a separate Species of Special Concern category. This category was reviewed as part of Florida's Imperiled Species Management Plan, with the majority of the species previously contained within the category either being removed from Florida's Endangered and Threatened Species list due to conservation success, or had their status changed to state-designated Threatened.

Table 11. Imperiled Wildlife Species occurring on or near the HHBCWMA

Common Name	Scientific Name	Status
American alligator	<i>Alligator mississippiensis</i>	FT (S/A)
Crested caracara	<i>Caracara cheriway</i>	FT
Eastern indigo snake	<i>Drymarchon couperi</i>	FT
Florida panther	<i>Puma concolor coryi</i>	FE
Florida sandhill crane	<i>Grus canadensis pratensis</i>	ST
Gopher tortoise	<i>Gopherus polyphemus</i>	ST
Little blue heron	<i>Egretta caerulea</i>	ST
Red-cockaded woodpecker	<i>Picoides borealis</i>	FE
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	SSC
Tricolored heron	<i>Egretta tricolor</i>	ST
Woodstork	<i>Mycteria americana</i>	FT

Abbreviation	Status
FE	Federal Endangered
FT	Federal Threatened
F(XN)	Federally Listed as an experimental population in Florida
FT(S/A)	Federally Threatened due to similarity of appearance
SSC	State Species of Special Concern
ST	State Threatened

- **Management Intent**

Management of wildlife on the HHBCWMA includes efforts designed to perpetuate all species of wildlife native to the area. The FWC uses a comprehensive resource management approach to managing FWC-managed areas. Restoring the form and function of Florida's natural communities is the foundation of this management philosophy. The FWC uses Objective-based Vegetative Management (OBVM) to monitor how specific vegetative parameters are responding to FWC management. OBVM includes the delineation of management units, quantification of the desired future condition for the natural community, selection of an indicator-based management objective for each unit and monitoring of the indicator to determine attainment or progress towards accomplishing the objective. In this way, management can be adapted to best accomplish the management objective for each vegetation management unit. Management objectives, which apply to several vegetation management units, or the entire management area, may also be developed through a similar process.

In addition, the FWC uses the Wildlife Conservation Prioritization and Recovery (WCPR) program to ensure management is having the desired effect on wildlife as another important component of the FWC's comprehensive resource management approach to

managing FWC-managed areas. The goal of WCPR is to provide assessment, recovery, and planning support for FWC-managed areas to enhance management of locally important and recovery of imperiled species. The WCPR strategy for the HHBCWMA was completed in December 2012 and outlines monitoring protocols and management actions for a suite of locally important species.

- **Conditions Affecting Intensity of Management**

Resources described in this management prospectus indicate conditions affecting intensity of management. These include natural community types, topography and soils, surface and ground water conditions, extent of historic disturbance, and already existing improvements. Environmentally sensitive areas, such as erosion-prone sites, important habitats, and outstanding natural areas and wetlands have been identified, and are appropriately managed and protected. Soil types and soil depth to water table ranges for the area are depicted in Figures 8 and 9, respectively.

As described above, the FWC conducted an analysis of historic vegetation of natural community types to determine appropriate desired future conditions. Upland wildlife management concentrates on appropriate vegetative manipulations determined by the FWC's OBVM protocol, which includes the application of prescribed fire for the area's fire-adapted communities, as well as the development of a WCPR strategy for the area to achieve conditions acceptable to a broad range of wildlife species. Areas sometimes require ecological restoration of ground cover, control of invasive species, and reforestation. Such resource management projects may be necessary to accomplish restoration objectives to attain the desired future condition. This is especially important for conservation of habitats and populations of imperiled or rare species. Landscape ecology is also important. Land use changes in the vicinity of the managed area may affect attainment of resource conservation goals for the area, and effectiveness of necessary resource management projects.

HHBCWMA Management Plan

The HHBCWMA management plan focuses on ecosystem management and the protection and management of locally important species, species of special concern, and rare and imperiled species. The FWC shall continue to assess the condition of wildlife resources and provide planning support to enhance management of locally important species and recovery of imperiled species on the HHBCWMA. The use of prescribed fire and other resource management activities shall continue to be implemented in order to maintain and restore natural communities and vegetation types to benefit native wildlife resources. Hydrological restoration may also be implemented where it is appropriate and feasible.

- **Timetable for Implementing Management Provisions**

A Habitat Management Plan was developed for the HHBCWMA in 2011. An updated management plan is being developed for the area that is projected to be approved and implemented in 2019, which will establish the management goals and objectives, along with short-term (2 years) and long-term (3-10 years) completion timelines, necessary to implement future resource and operational management actions on the HHBCWMA. The management plan also establishes the current and future roles of cooperating entities including governmental agencies, non-governmental organizations, and other stakeholders.

The updated management plan for the HHBCWMA will stress ecosystem management, and the protection and management of locally important and imperiled species. To aid in this effort, as indicated earlier, historic analysis of natural communities and vegetation types on the area has been conducted. Quantified vegetation management objectives have also been developed for the area through FWC's OBVM program. The FWC will continue to assess the condition of wildlife resources and provide planning support to enhance management of locally important species and recovery of imperiled species on the HHBCWMA through the FWC WCPR program. Use of prescribed fire and other resource management activities will also continue to be implemented on the area to maintain and restore natural communities and vegetation types to benefit native wildlife resources.

- **Estimate of Economic Potential**

An FWC economic analysis indicates that the HHBCWMA generates an estimated annual economic impact of \$3,441,990 in retail sales for the State and south Florida region. This estimated annual economic impact has aided in the creation or maintenance of an estimated 35 jobs. These figures were derived using an estimated annual visitation rate of 17,616 visitors per year. The visitation rate was calculated based on numbers obtained from vehicle counters at the HHBCWMA.

Further potential of the HHBCWMA will depend upon future uses to be approved in the management plan. Additional economic impact from environmental lands such as the HHBCWMA might include sales of various permits and recreational user fees and ecotourism activities, if such projects could be economically developed. The annual area regulations can be consulted to clarify the necessary and required permits, fees, and regulations. The long-term values of ecosystem services to local and regional land and water resources, and to human health, through the protection of air and water quality are expected to be significant. The legislature appropriates funds for land management.

- **Recommendations as to Other Governmental Agency Involvement**

The FWC and SJRWMD will continue to cooperate with other state and local governmental agencies including the DEP, Osceola County, Division of Historical Resources (DHR), and FFS, in management of the property.

- **Estimate of Costs**

The following is an estimate of costs to optimally operate and manage the HHBCWMA under the HHBCWMA Management Plan. Given the types of management activities required for the area and the total number of acres within the area, approximately three full-time equivalent (FTE) positions would be necessary to optimally manage the HHBCWMA. Salary requirements for these FTE positions, as well as those of other needed FWC staff, and costs to operate and manage the HHBCWMA are reflected in the cost estimates below. All land management funding is dependent upon annual legislative appropriations.

Herky Huffman/Bull Creek WMA Management Plan

Cost Estimate

Maximum expected one-year expenditure

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority</u>	<u>Priority schedule:</u>
Exotic Species Control	\$199,898	(1)	(1) Immediate (annual)
Prescribed Burning	\$40,716	(1)	(2) Intermediate (3-4 years)
Cultural Resource Management	\$558	(1)	(3) Other (5+ years)
Timber Management	\$0	(1)	
Hydrological Management	\$0	(1)	
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$56,696	(1)	
Subtotal	\$297,868		
 <u>Administration</u>			
General administration	\$1,673	(1)	
 <u>Support</u>			
Land Management Planning	\$25,772	(1)	
Land Management Reviews	\$2,973	(3)	
Training/Staff Development	\$22,717	(1)	
Vehicle Purchase	\$254,988	(2)	
Vehicle Operation and Maintenance	\$68,919	(1)	
Other (Technical Reports, Data Management, etc.)	\$4,781	(1)	
Subtotal	\$380,150		
 <u>Capital Improvements</u>			
New Facility Construction	\$2,686	(2)	
Facility Maintenance	\$178,973	(1)	
Subtotal	\$181,659		
 <u>Visitor Services/Recreation</u>			
Info./Education/Operations	\$8,334	(1)	
 <u>Law Enforcement</u>			
Resource protection	\$0	(1)	
 Total	 \$869,685	 *	

* Based on the characteristics and requirements of this area, three FTE positions would be optimal to fully manage this area. All land management funding is dependent upon annual legislative appropriations.

Herky Huffman/Bull Creek WMA Management Plan Cost Estimate
Ten-year projection

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority</u>	Priority schedule:
Exotic Species Control	\$1,756,326	(1)	(1) Immediate (annual)
Prescribed Burning	\$357,739	(1)	(2) Intermediate (3-4 years)
Cultural Resource Management	\$4,899	(1)	(3) Other (5+ years)
Timber Management	\$0	(1)	
Hydrological Management	\$0	(1)	
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$498,139	(1)	
Subtotal	\$2,617,104		
<u>Administration</u>			
General administration	\$14,698	(1)	
<u>Support</u>			
Land Management Planning	\$226,439	(1)	
Land Management Reviews	\$8,509	(3)	
Training/Staff Development	\$199,591	(1)	
Vehicle Purchase	\$897,315	(2)	
Vehicle Operation and Maintenance	\$605,531	(1)	
Other (Technical Reports, Data Management, etc.)	\$42,005	(1)	
Subtotal	\$1,979,391		
<u>Capital Improvements</u>			
New Facility Construction	\$7,760	(2)	
Facility Maintenance	\$1,572,477	(1)	
Subtotal	\$1,580,236		
<u>Visitor Services/Recreation</u>			
Info./Education/Operations	\$73,223	(1)	
<u>Law Enforcement</u>			
Resource protection	\$0	(1)	
<u>Total</u>	\$6,264,652	*	

* Based on the characteristics and requirements of this area, three FTE positions would be optimal to fully manage this area. All land management funding is dependent upon annual legislative appropriations.

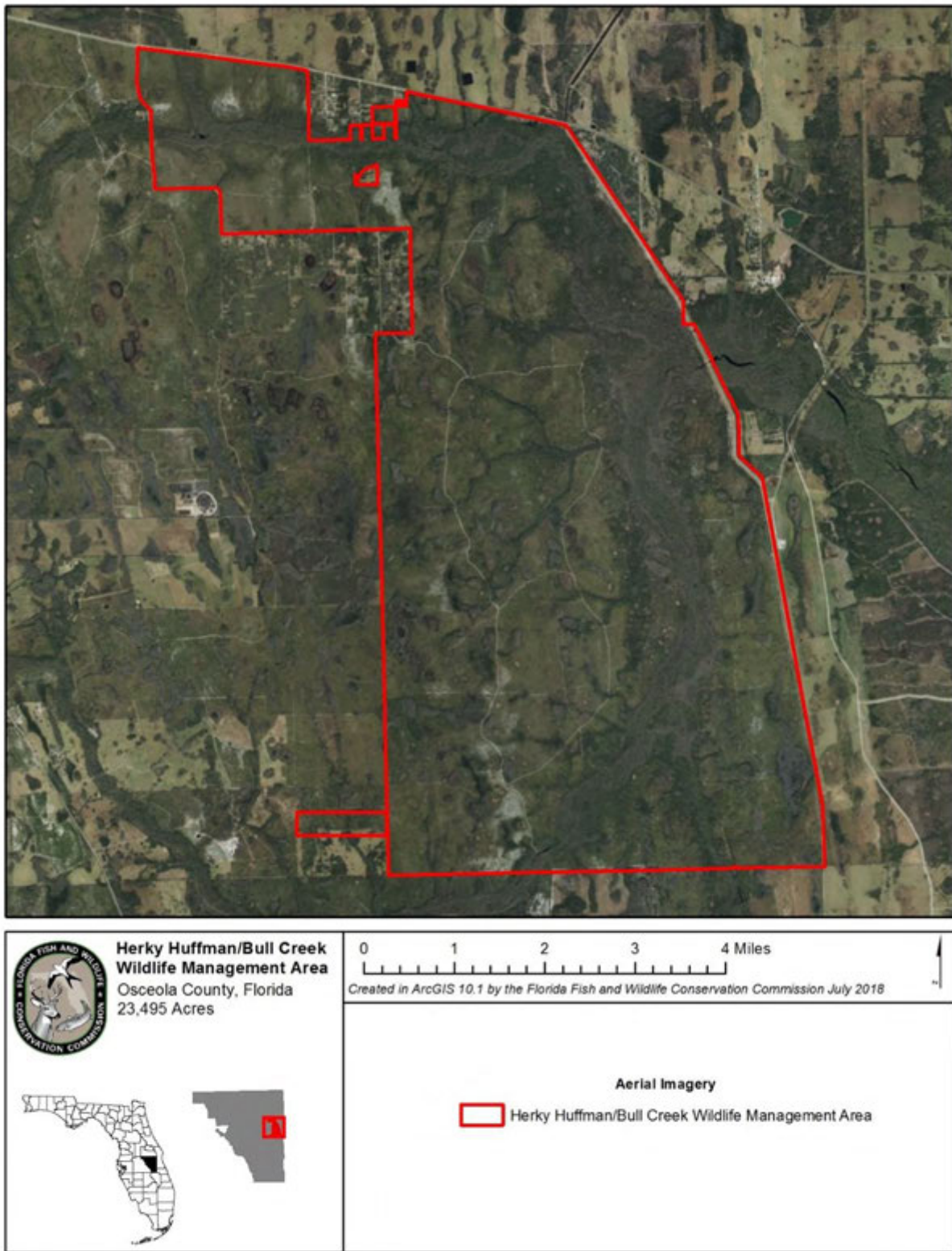


Figure 2. Aerial Boundary of the HHBCWMA

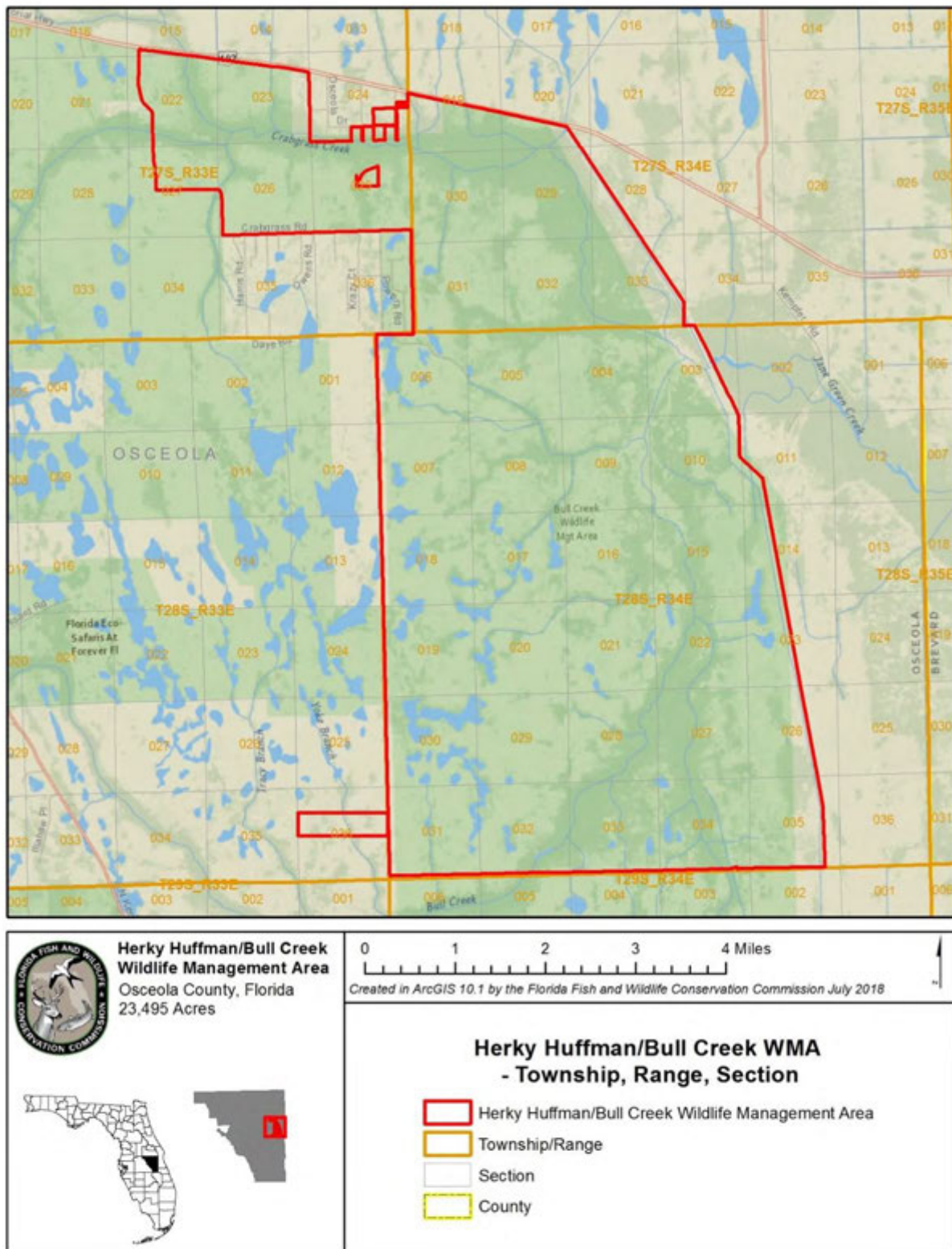


Figure 3. HHBCWMA Proximity Map with Section, Township, and Range

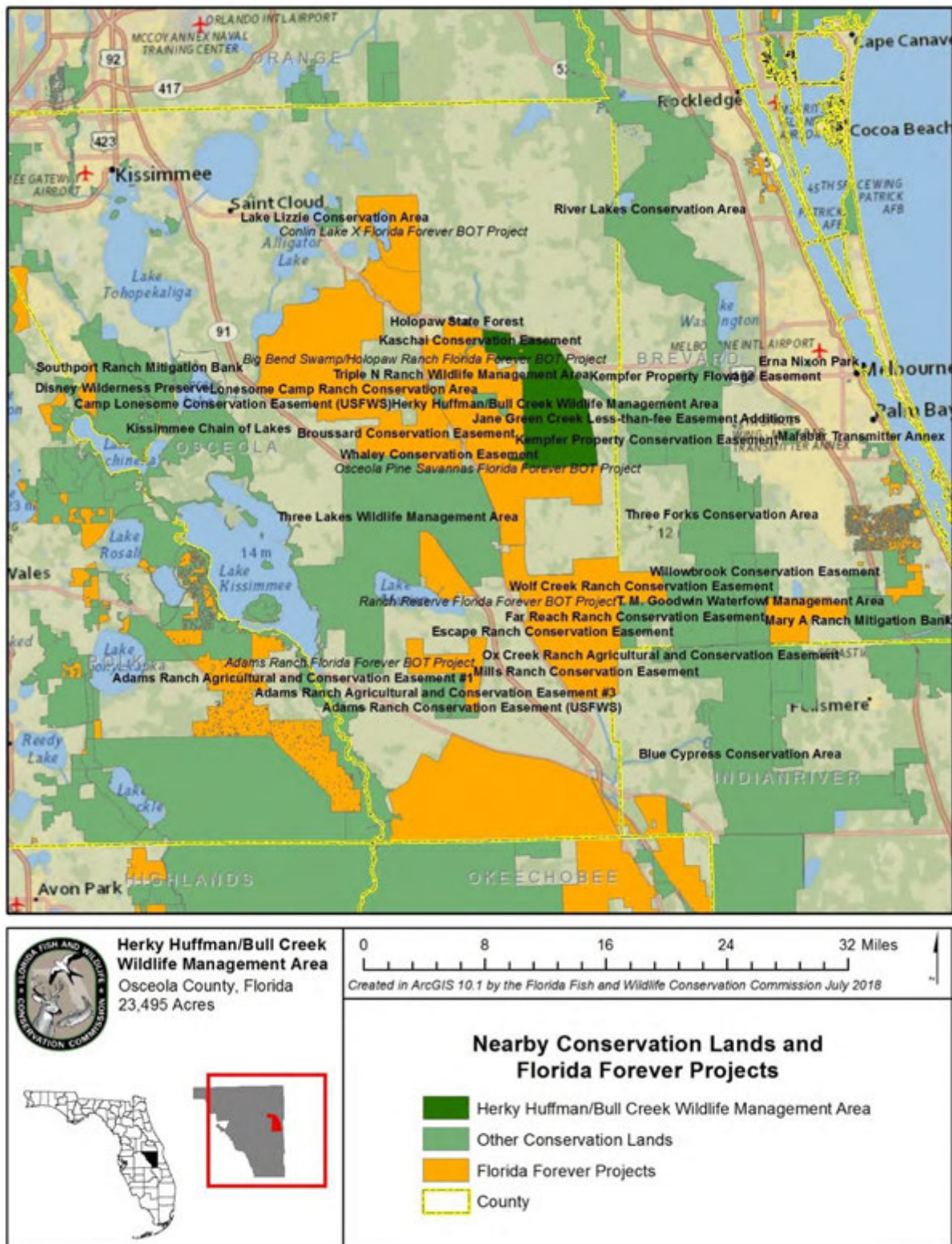


Figure 4. Nearby Conservation Lands and Florida Forever Projects

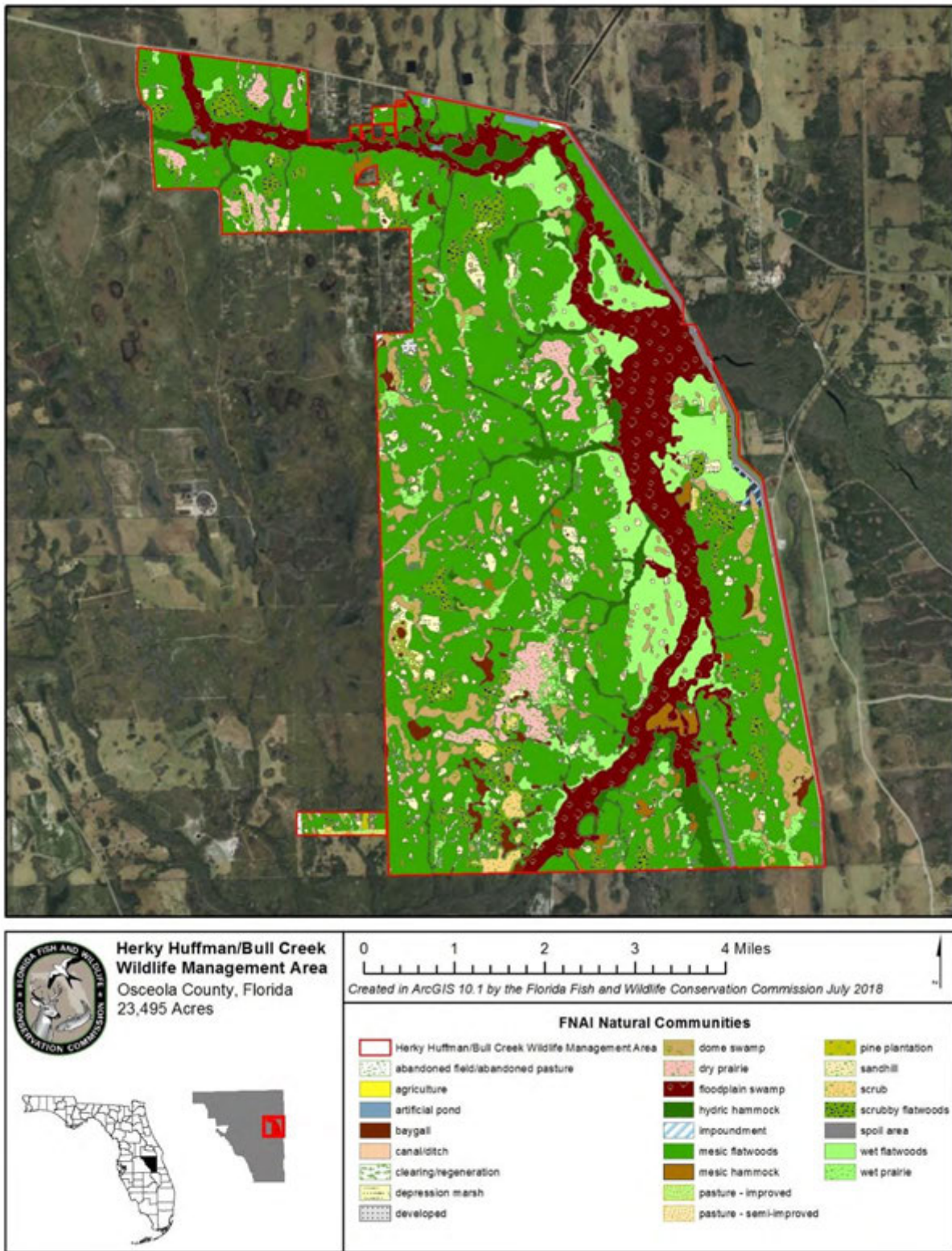


Figure 5. Natural Communities Found on the HHBCWMA

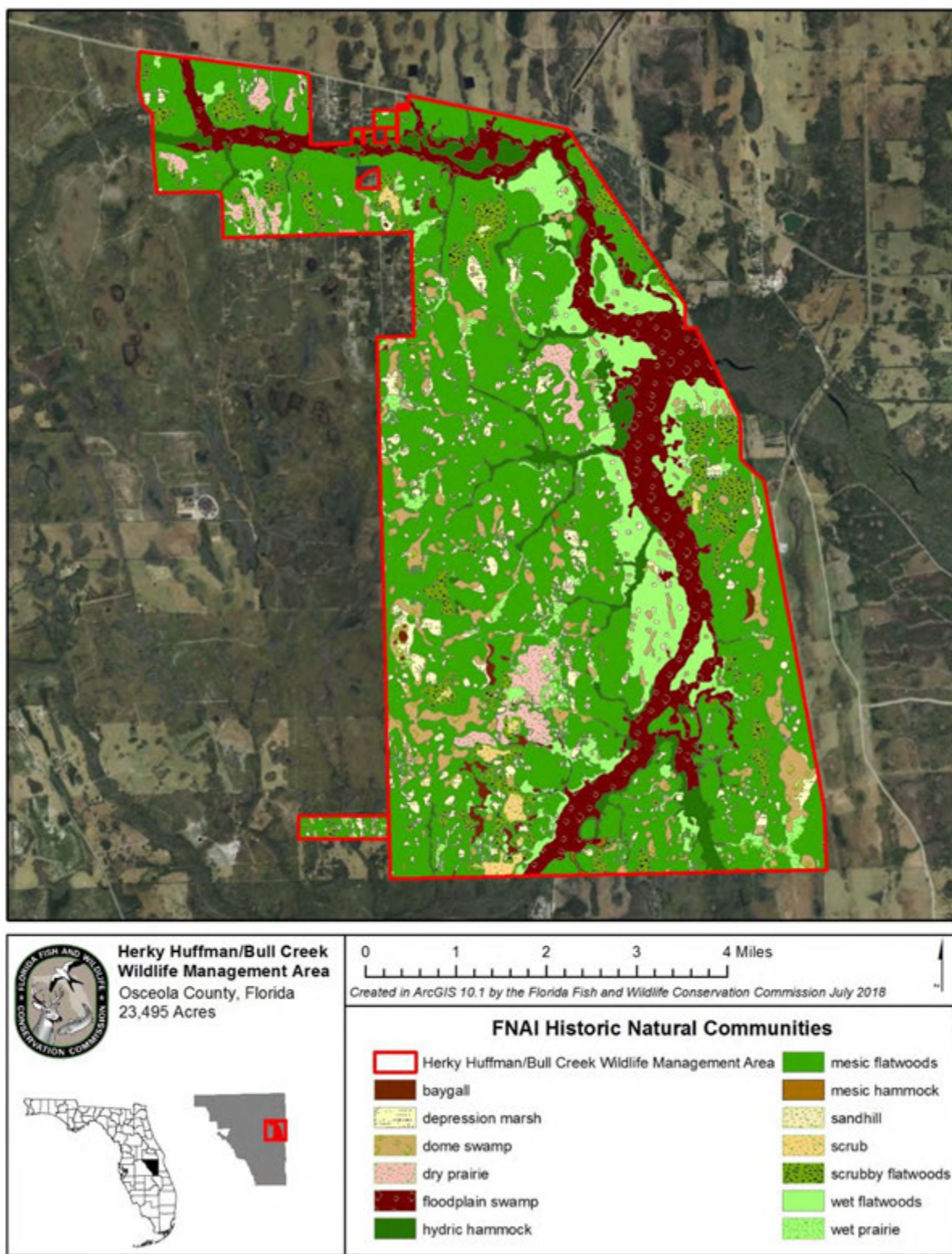


Figure 6. Historic Natural Communities Found on the HHBCWMA

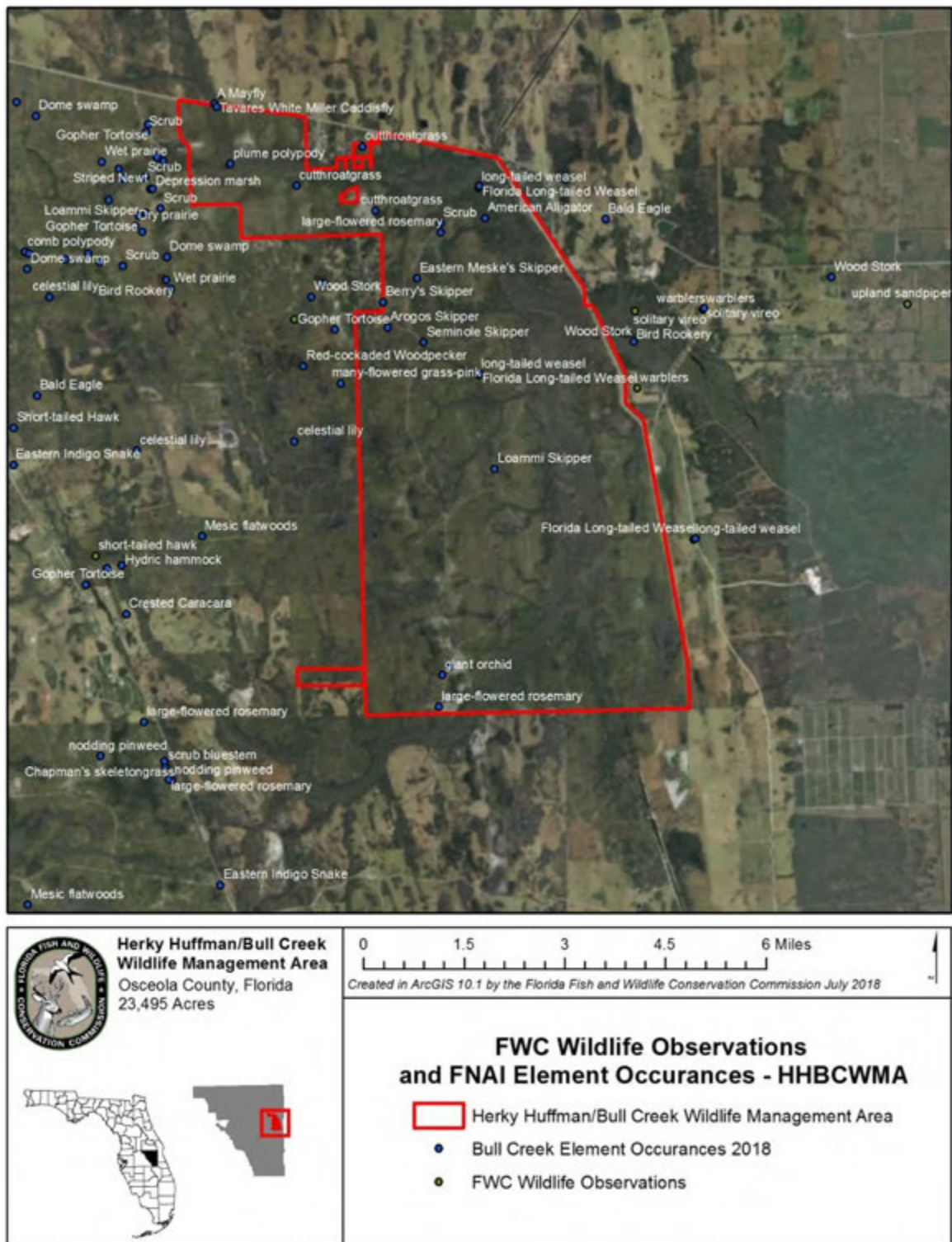


Figure 7. FWC Wildlife Observations and FNAI Element Occurrences

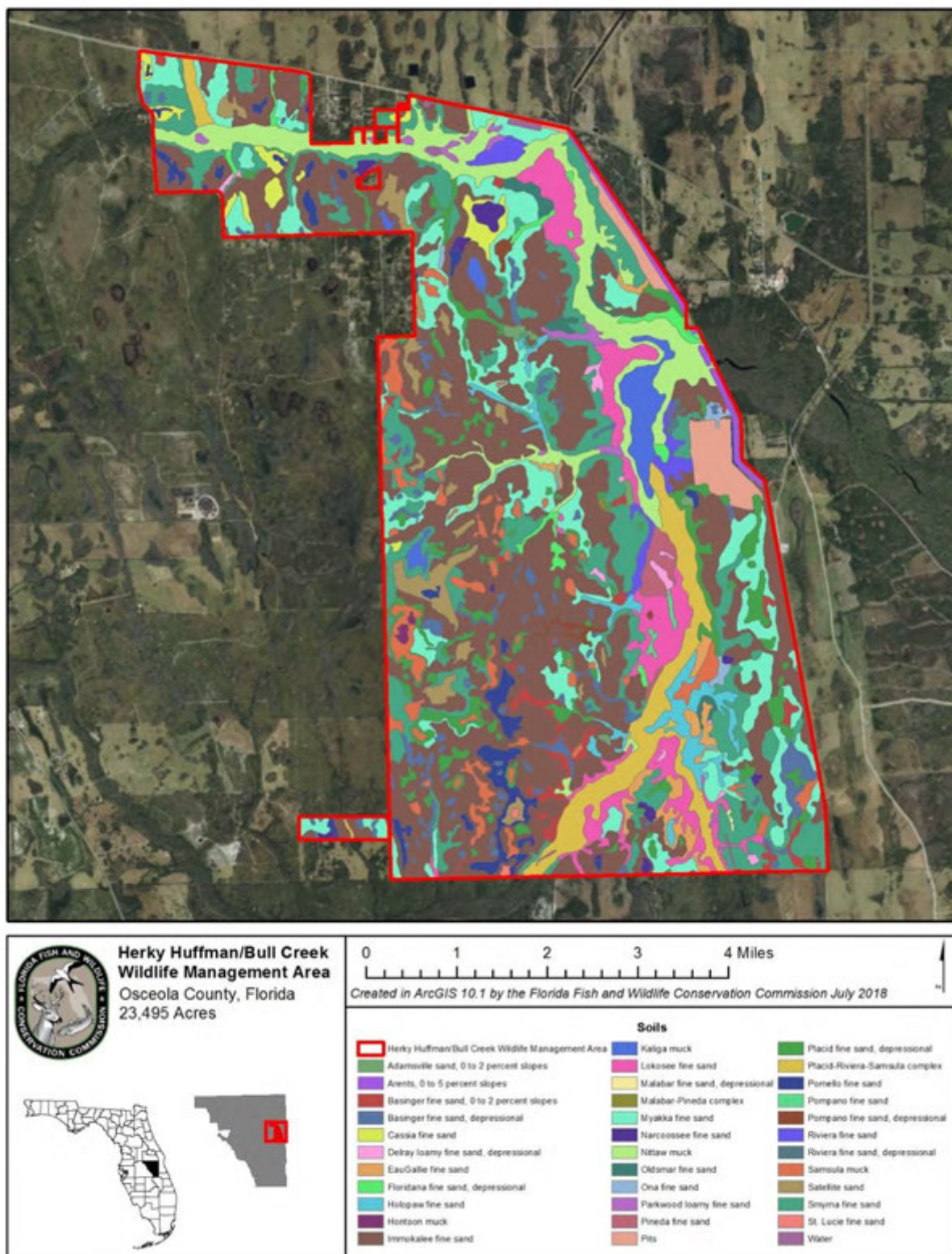


Figure 8. HHBCWMA Soil Types

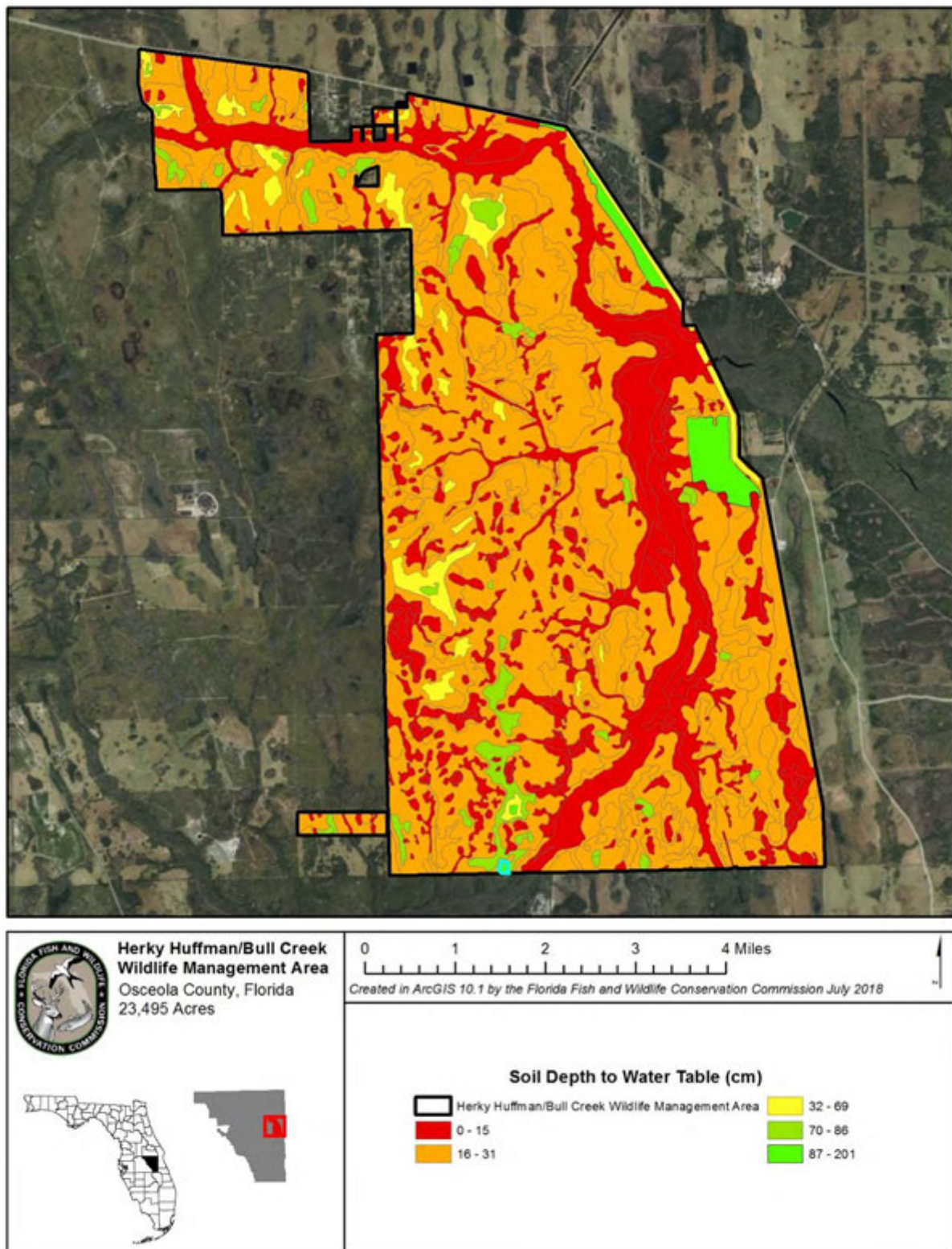


Figure 9. HHBCWMA Soil Depth to Water Table

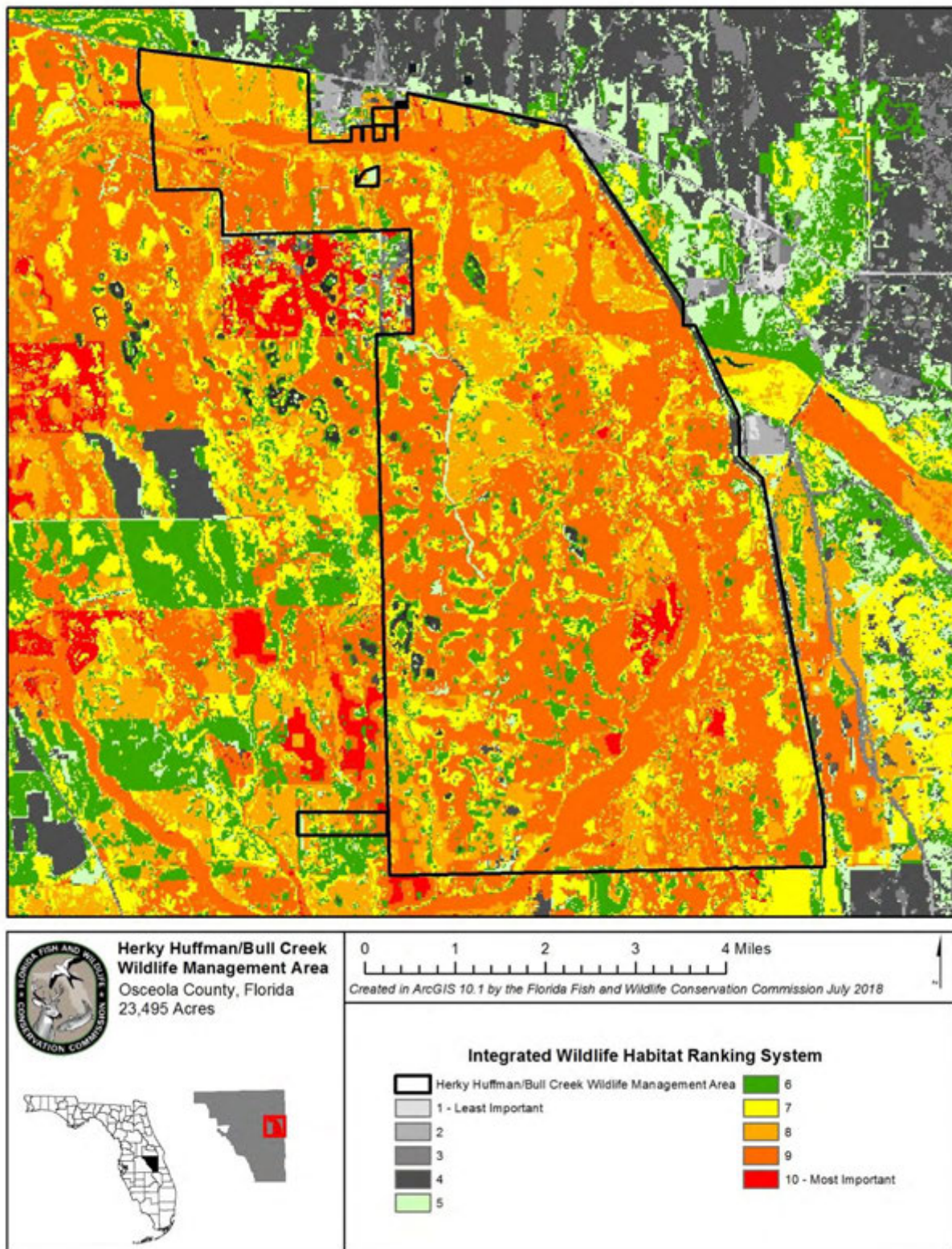


Figure 10. HHBCWMA Integrated Wildlife Habitat Ranking

12.7 Soil Series Descriptions

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Map Unit Description

Osceola County, Florida

[Minor map unit components are excluded from this report]

Map unit: 1 - Adamsville sand, 0 to 2 percent slopes

Component: Adamsville (92%)

The Adamsville component makes up 92 percent of the map unit. Slopes are 0 to 2 percent. This component is on knolls on flatwoods on coastal plains. The parent material consists of sandy 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 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 34 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY008FL Upland Hardwood Hammocks ecological site. 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: 4 - Arents, 0 to 5 percent slopes

Component: Arents (100%)

The Arents component makes up 100 percent of the map unit. Slopes are 0 to 5 percent. This component is on fills, rises on marine terraces on coastal plains. The parent material consists of altered 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 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 27 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 0 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 5 - Basinger fine sand, 0 to 2 percent slopes

Component: Basinger (90%)

The Basinger component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces. The parent material consists of sandy 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 low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July, August. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. 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: 6 - Basinger fine sand, depressional

Component: Basinger, depressional (85%)

The Basinger, depressional component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of 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 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 frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 9 - Cassia fine sand

Component: Cassia (95%)

The Cassia component makes up 95 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy 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

Map Unit Description

Osceola County, Florida

Map unit: 9 - Cassia fine sand

Component: Cassia (95%)

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 23 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY001FL Sand Pine Scrub ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 10 - Delray loamy fine sand, depressional

Component: Delray, depressional (90%)

The Delray, depressional component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions 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 very poorly 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 frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 11 - EauGallie fine sand

Component: EauGallie (90%)

The EauGallie component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 5 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 12 - Floridana fine sand, depressional

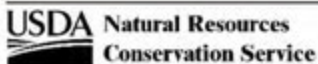
Component: Floridana, depressional (90%)

The Floridana, depressional component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions 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 very 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 not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 11 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 14 - Holopaw fine sand

Component: Holopaw (90%)

The Holopaw component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains, flats 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 low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.



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Survey Area Version Date: 12/17/2013

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Map Unit Description

Osceola County, Florida

Map unit: 15 - Hontoon muck

Component: Hontoon (90%)

The Hontoon component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material. 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 high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 80 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 16 - Immokaalee fine sand

Component: Immokaalee (90%)

The Immokaalee component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 17 - Kaliga muck

Component: Kaliga (90%)

The Kaliga component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over stratified loamy 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 low. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 64 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 18 - Lokosee fine sand

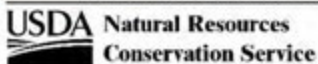
Component: Lokosee (85%)

The Lokosee component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 20 - Malabar fine sand, depressional

Component: Malabar, depressional (85%)

The Malabar, depressional component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions 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 very poorly 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 frequently ponded.



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Map Unit Description

Osceola County, Florida

Map unit: 20 - Malabar fine sand, depressional

Component: Malabar, depressional (85%)

A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 21 - Malabar-Pineda complex

Component: Malabar (55%)

The Malabar component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains, flats 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Pineda (35%)

The Pineda component makes up 35 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 22 - Myakka fine sand

Component: Myakka (85%)

The Myakka component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy 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 very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 5 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 24 - Narcoossee fine sand

Component: Narcoossee (90%)

The Narcoossee component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of 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 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 33 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY006FL Upland Hardwood Hammocks ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Osceola County, Florida

Map unit: 25 - Nittaw muck

Component: Nittaw (90%)

The Nittaw component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of clayey 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 low. Available water to a depth of 60 inches is high. Shrink-swell potential is high. This soil is occasionally flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 55 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 26 - Oldsmar fine sand

Component: Oldsmar (85%)

The Oldsmar component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 27 - Ona fine sand

Component: Ona (85%)

The Ona component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 29 - Parkwood loamy fine sand, occasionally flooded

Component: Parkwood, occasionally flooded (90%)

The Parkwood, occasionally flooded component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats 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 low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 30 - Pineda fine sand

Component: Pineda (90%)

The Pineda component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats 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

Map Unit Description

Osceola County, Florida

Map unit: 30 - Pineda fine sand

Component: Pineda (90%)

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 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 31 - Pits

Component: Pits (95%)

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

Map unit: 32 - Placid fine sand, depressional

Component: Placid, depressional (85%)

The Placid, depressional component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of 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 high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 34 - Pomello fine sand, 0 to 5 percent slopes

Component: Pomello (85%)

The Pomello component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of 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 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 33 inches during July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY002FL Longleaf Pine-turkey Oak Hills ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 35 - Pompano fine sand

Component: Pompano (90%)

The Pompano component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Osceola County, Florida

Map unit: 37 - Pompano fine sand, depressional

Component: Pompano, depressional (92%)

The Pompano, depressional component makes up 92 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of 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 high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 38 - Riviera fine sand

Component: Riviera (90%)

The Riviera component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats 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 moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 39 - Riviera fine sand, depressional

Component: Riviera, depressional (90%)

The Riviera, depressional component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions 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 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 not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 40 - Samsula muck

Component: Samsula (90%)

The Samsula component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over 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 high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 65 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 41 - Satellite sand

Component: Satellite (85%)

The Satellite component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of sandy 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

Map Unit Description

Osceola County, Florida

Map unit: 41 - Satellite sand

Component: Satellite (85%)

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 22 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY002FL Longleaf Pine-turkey Oak Hills ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 42 - Smyrna fine sand

Component: Smyrna (85%)

The Smyrna component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy 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 not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 43 - St. Lucie fine sand, 0 to 5 percent slopes

Component: St. Lucie (85%)

The St. Lucie component makes up 85 percent of the map unit. Slopes are 0 to 5 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 excessively 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. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 48 - Placid-Riviera-Samsula complex, frequently flooded

Component: Placid, frequently flooded (45%)

The Placid, frequently flooded 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 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 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 0 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Riviera, frequently flooded (28%)

The Riviera, frequently flooded component makes up 28 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 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 0 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Osceola County, Florida

Map unit: 48 - Placid-Riviera-Samsula complex, frequently flooded

Component: Samsula, frequently flooded (18%)

The Samsula, frequently flooded component makes up 18 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on flood plains on marine terraces on coastal plains. The parent material consists of herbaceous organic material over 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 high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 65 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. 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 maximum sodium adsorption ratio of 1 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.

12.8 FNAI Element Occurrence Data Usage Letter



1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
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 Biodiversity

12.9 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.

12.10 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.

Florida Fish and Wildlife Conservation Commission | Herky Huffman/Bull Creek Wildlife
Management Area Management Plan

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: _____

Florida Fish and Wildlife Conservation Commission | Herky Huffman/Bull Creek Wildlife
Management Area Management Plan

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.

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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:

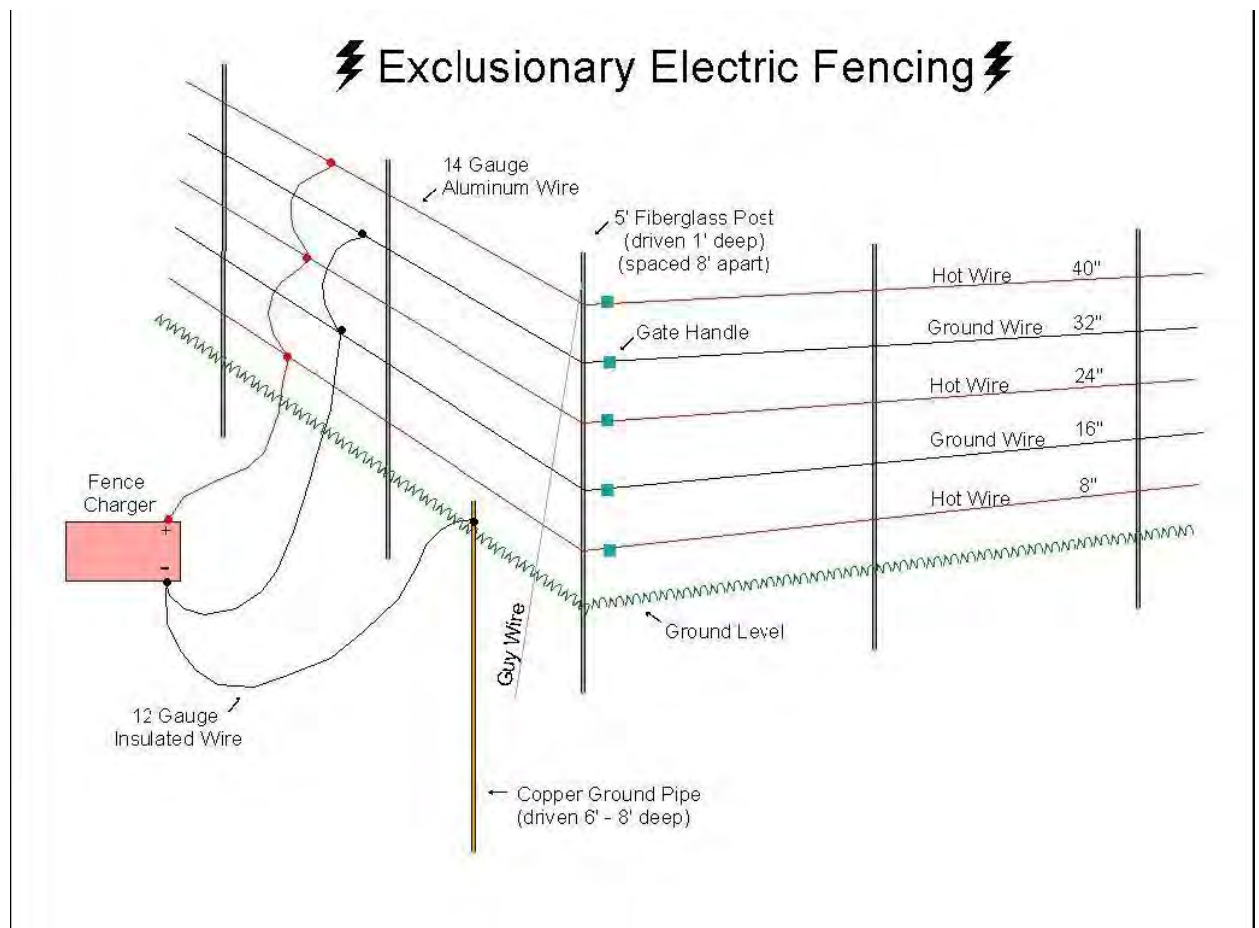
1. If using a 12-volt fence charger, ensure that the battery is charged; check every two weeks.
2. Make sure terminals on the charger and battery are free of corrosion.
3. Make sure hot wires are not being grounded out by tall weeds, fallen tree branches, broken insulators, etc.
4. If fence wires have 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

Florida Fish and Wildlife Conservation Commission | Herky Huffman/Bull Creek Wildlife
Management Area Management Plan

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.

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12.11 Apiary Contract # 18165

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 Archangel Michael Apiaries, Inc., 45-5158792, whose address is 12600 West Highway 318, Williston, Florida 32696, 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 upon execution and will end three (3) years from the date of execution.
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) (h) below.
 - b. To provide technical assistance for bear-proofing, if required by Area Biologist, of site(s) made available under this Agreement.
 - c. To allow the USER to place a total number of 150 hive boxes on the COMMISSION-managed property on the Herky Huffman/Bull Creek WMA and as represented by the Attachment B map.
3. The USER Agrees:
 - a. To pay \$120 on or before the execution date of this Agreement and each year thereafter on or before the 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, Wildlife and Habitat Management Section, Attn: Section Leader, 620 South Meridian Street, Tallahassee, Florida 32399-1600.
 - b. To have no more than 50 hive boxes on each apiary site property at one time for a total not to exceed 150 hive boxes within the Herky Huffman/Bull Creek WMA.

- c. To comply with the Florida Honey Certification and Honeybee Law, Chapter 586, Florida Statutes, and Rule 5B-19, 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 A, Florida Fish and Wildlife Conservation Commission (FWC) Technical Information Bulletin, December 2001, Use of Electric Fencing To Exclude Bears and Prevent Property Damage)
- 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 three (3) years and issuance of a new agreement will be contingent upon a satisfactory performance evaluation and approval of the Area Biologist.
- 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 the Area Biologist,

presented to and approved by the Wildlife and Habitat Management Section Leader.

- f. The USER shall save, hold harmless and indemnify the State of Florida and the COMMISSION against any and all liability, claims, judgments or costs of whatsoever kind and nature for injury to, or death of any person or persons and for the loss or damage to any property resulting from the use, service, operation or performance of work under the terms of this Contract, resulting from the acts or omissions of the USER, his subcontractor, or any of the employees, agents or representatives of the USER or subcontractor.
- g. This Contract with all incorporated attachments and exhibits represents the entire agreement of the parties. Any alterations, variations, changes, modifications or waivers of provisions of this Contract shall only be valid when they have been reduced to writing, and duly signed by each of the parties hereto, unless otherwise provided herein.
- h. The sites covered by this Agreement are described as being in the vicinity of or at the following latitude and longitude coordinates.

For the Herky Huffman/Bull Creek WMA:

Site 1	Latitude 28° 6' 10.08"N	Longitude 80° 56' 53.29"W
Site 2	Latitude 28° 2' 39.34"N	Longitude 80° 56' 55.07"W
Site 3	Latitude 28° 3' 10.61"N	Longitude 80° 56' 10.00"W

represented by the Attachment B map.

- i. 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.

- j. 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.
- k. This Agreement may be terminated by the COMMISSION upon thirty (30) days written notice to the USER in the event the continuations 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.

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IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year last below written.

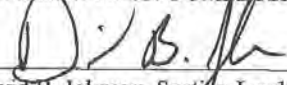

USER SIGNATURE

Date: 11/14/2018

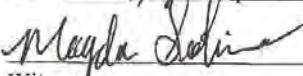

Witness


Witness

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION


David B. Johnson, Section Leader
Wildlife and Habitat Management

Date: 11/20/18


Witness


Witness

Approved as to form and legality



Attachment A: Florida Fish and Wildlife Conservation Commission (FWC) Technical
Information Bulletin, December 2001, Use of Electric Fencing
To Exclude Bears and Prevent Property Damage

Attachment B Map of Apiary Location for Apiaries on Herky Huffman/Bull Creek
WMA



December 2001

Florida Fish and Wildlife Conservation Commission
Technical Information Bulletin

Use of Electric Fencing to Exclude Bears and Prevent Property Damage

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:

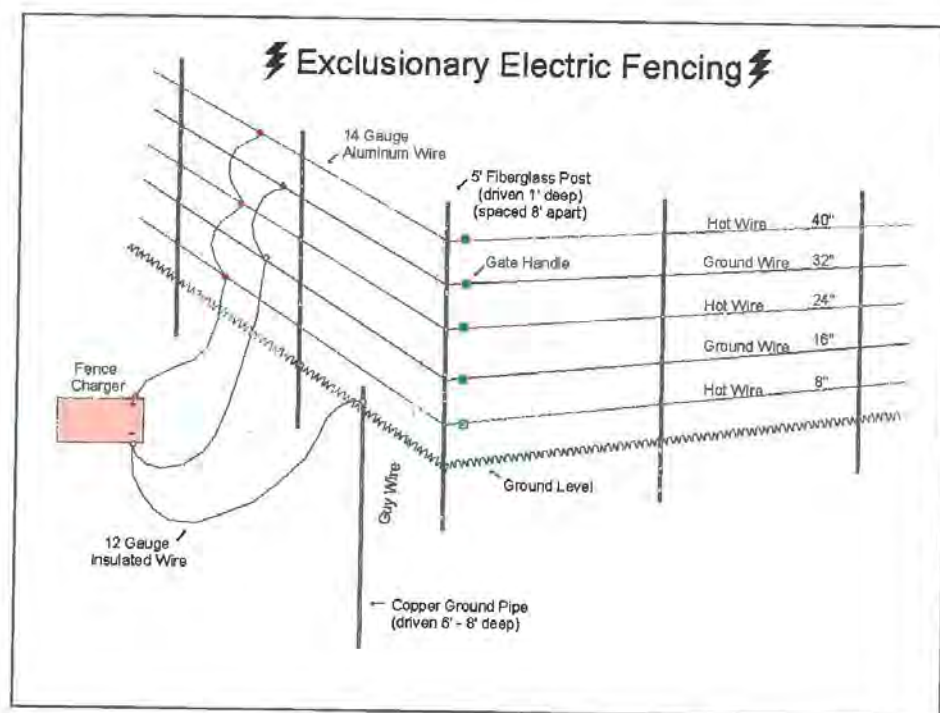
1. If using a 12-volt fence charger, ensure that the battery is charged; check every two weeks.
2. Make sure terminals on the charger and battery are free of corrosion.
3. Make sure hot wires are not being grounded out by tall weeds, fallen tree branches, broken insulators, etc.
4. If fence wires have 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.

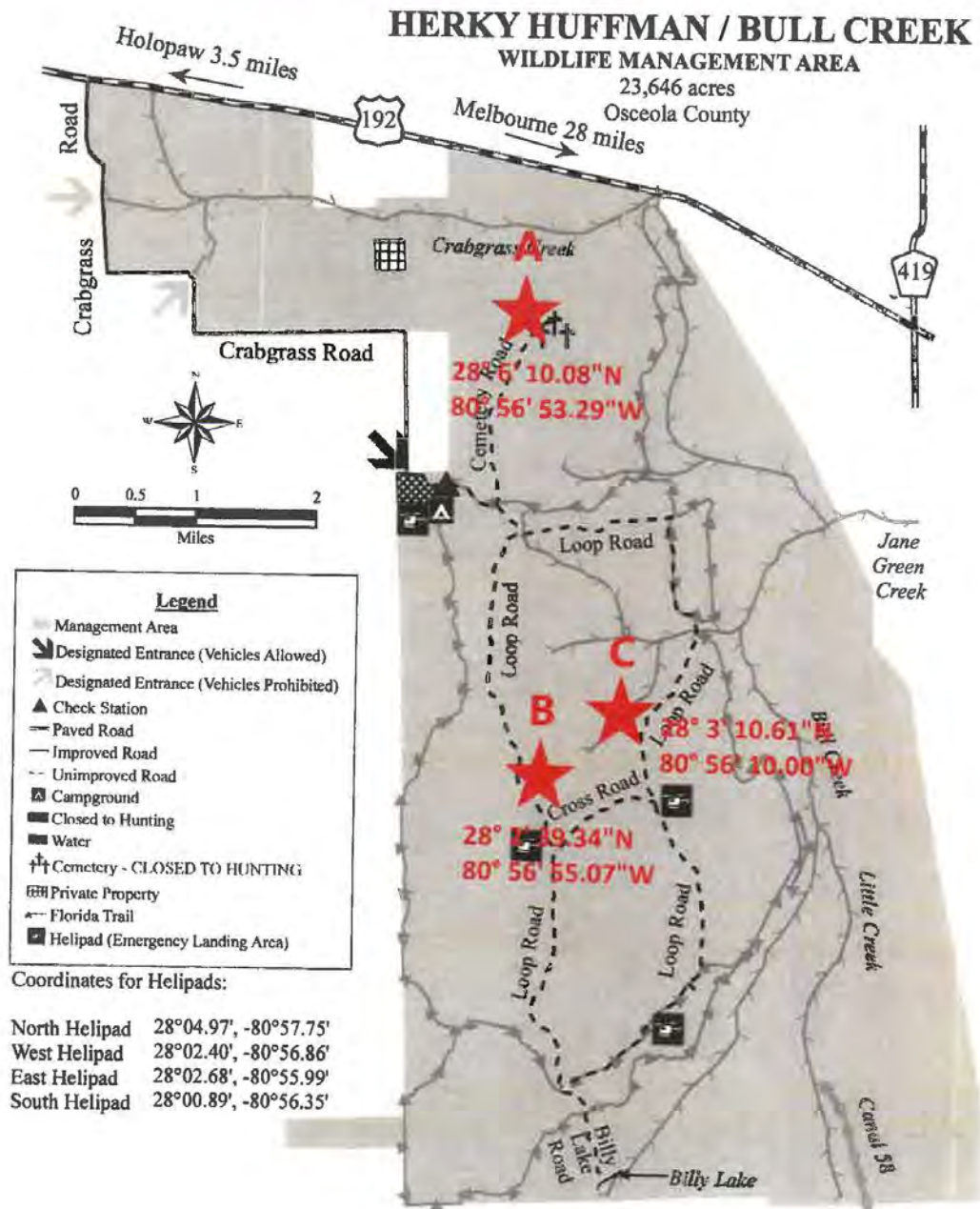
LITERATURE CITED

FitzGerald, James (1984), *The Best Fences*. Storey Publishing Bulletin A-92, Pownal, Vermont. p. 14-16.

Figure 1. Diagram of properly constructed electric fence to exclude bears.



POTENTIAL APIARY SITES



12.12 Prescribed Burn Plan

Herky Huffman/Bull Creek WMA

Fire Management Plan

INTRODUCTION

Fires, whether naturally occurring or anthropogenic, are an integral part of the ecology of pine flatwoods and prairie regions of Central Florida. Periodic burning has maintained fire-dependent plant communities in the southeast for thousands of years. However, the exclusion of fire or disruption of the natural frequency can lead to a succession of a variety of vegetation types that are not desirable (e.g. hardwood hammock), encourages non-native plants to thrive, causes less nutrient recycling, leads to high fuel loads within the system, and allows a closed canopy system. This closed canopy discourages fire-dependent plant growth and thus has negative effects on fire-dependent wildlife such as the red-cockaded woodpecker (*Picoides borealis*). Overall, dense underbrush, which develops with a lack of fire, is undesirable for many wildlife species as it impedes access and decreases quality of foraging habitat. In addition, as these dense fuels accumulate, wildfire hazard becomes more prevalent and could cause catastrophic fires that pose a risk to natural resources as well as human life and property.

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*), northern bobwhite (*Colinus virginianus*), mourning dove (*Zenaidura macroura*) and wild turkey (*Meleagris gallopavo*). Prescribed burns stimulate fruit and seed production in plants and can lead to higher yields and increase quality of palatable plants which in turn promotes a large and varied wildlife population. Additionally, prescribed burning helps improve recreational and aesthetic values.

DESCRIPTION OF AREA

The Herky Huffman/Bull Creek Wildlife Management Area (HHBCWMA) is located 30 miles west of Melbourne on Hwy 192 which forms the northern boundary. The western boundary consists of private landowners and Triple N Ranch WMA (TNRWMA). The southern boundary is Deseret Ranch and the eastern boundary is Kempfer Ranch.

The HHBCWMA contains 23,495 acres of vegetative communities, with a mosaic of uplands and wetlands comprised of the following 17 FNAI natural and anthropogenic communities: Baygall, Depression Marsh, Dome Swamp, Dry Prairie, Floodplain Swamp, Hydric Hammock, Mesic Flatwoods, Mesic Hammock, Pasture – Improved, Pasture – Semi-improved, Pine Plantation, Ruderal, Sandhill, Scrub, Scrubby Flatwoods, Wet Flatwoods, and Wet Prairie. The following natural community descriptions were compiled by the Florida Natural Areas Inventory (FNAI) in 2011 for the 2011-2021 management plan for HHBCWMA.

Baygall: Baygall is a forested or shrub dominated community that occurs on muck rich hydric soils and typically receives its water inputs from ground water seepages. At the HHBCWMA, there are approximately 285 acres of this community type including some acreage that has developed in disturbed historic swamp communities. Once established, this community often resists prescribed fire although growing season fire can be effectively used to reduce the spread into non-historic areas.

The canopy of the baygall community at the HHBCWMA typically includes red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), sweetbay (*Magnolia virginiana*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), slash pine (*Pinus elliottii*), and pond cypress (*Taxodium ascendens*). Baygall at the HHBCWMA often lacks a well formed subcanopy and a dense shrub component consisting of loblolly bay, dahoon (*Ilex cassine*), fetterbush (*Lyonia lucida*), sweetbay, wax myrtle (*Myrica cerifera*), and swamp bay (*Persea palustris*) forms a dense tangle in this natural community.

Depression Marsh:

Depression marshes are scattered throughout the flatwoods and are herbaceous wetland communities with concentric zones of vegetation found in circular depressions. There are approximately 967 acres of this community at the HHBCWMA. Depression marshes are commonly inundated with water with a gradual transition occurring between the surrounding community and the center of the marsh. Depression marshes that have been well maintained by fire most often lack any kind of canopy trees or dense shrub cover. Where fire has not been effective at controlling the edges, there may be a scattered overstory consisting of red maple, swamp tupelo, slash pine, cabbage palm (*Sabal palmetto*), and pond cypress.

The shrub layer in a healthy depression marsh is short and sparse and often includes St. Johnswort (*Hypericum fasciculatum*), myrtleleaf St. Johnswort (*Hypericum myrtifolium*), water toothleaf (*Stillingia aquatica*), common buttonbush (*Cephalanthus occidentalis*), and roundpot St. Johnswort (*Hypericum cistifolium*). The groundcover is often dense and diverse and includes herbaceous species such as blue maidencane (*Amphicarpum muhlenbergianum*), shortspike bluestem (*Andropogon brachystachyus*), longleaf threeawn (*Aristida palustris*), bottlebrush threeawn (*Aristida spiciformis*), and wiregrass (*Aristida stricta* var. *beyrichiana*).

Dome Swamp:

Dome swamps at the HHBCWMA are found scattered throughout the property within the flatwoods matrix and comprise approximately 1,429 acres. Trees in the center are typically taller than those on the edge giving it a dome-shaped profile. Fire burns into the edges of this community but typically is unable to penetrate very deep due to sparse fuels and wetter conditions. The ecotone of this community often contains a wet prairie or marsh habitat but in cases where fire has been excluded, a shrubby component may be found.

Most of the dome swamps at the HHBCWMA contain younger mature to mature canopies consisting of predominantly pond cypress; other canopy species that are found include red maple, loblolly bay, and swamp bay. Shrub cover ranges from sparse to moderately dense and is

comprised of loblolly bay, dahoon, gallberry (*Ilex glabra*), fetterbush, and wax myrtle. The herbaceous layer commonly includes different species of ferns and epiphytes

Dry Prairie:

Dry prairies are upland areas of dwarf shrubs and grasses with few or no pines and require frequent fires to maintain them in this condition. At the HHBCWMA, there are approximately 528 acres of dry prairie, mostly found adjacent to scrubby flatwoods. Most of the cover is made up of short shrubs, stunted saw palmetto (*Serenoa repens*), dwarf live oak (*Quercus minima*) and the occasional longleaf pine.

The dry prairie community is characterized by its lack of tree canopy, especially in dry prairie that has been well maintained with prescribed fire. Shrubs of less than a meter tall are common and include netted pawpaw (*Asimina reticulata*), Atlantic St. Johnswort (*Hypericum tenuifolium*), fourpetal St. Johnswort (*Hypericum tetrapetalum*), gallberry, gopher apple (*Licania michauxii*), coastalplain staggerbush (*Lyonia fruticosa*), fetterbush, wax myrtle, dwarf wax myrtle (*Myrica cerifera* var. *pumila*), wild pennyroyal (*Piloblephis rigida*), dwarf live oak, runner oak (*Quercus pumila*), saw palmetto, and shiny blueberry (*Vaccinium myrsinites*). The herbaceous layer is variable and ranges from sparse to dense with common species being bottlebrush threeawn, wiregrass, witchgrass (*Dichanthelium* sp.), skeletongrass (*Gymnopogon* sp.), blackroot (*Pterocaulon pycnostachyum*), sweet goldenrod (*Solidago odora*), lopsided indiagrass (*Sorghastrum secundum*), and Carolina yellow-eyed grass (*Xyris caroliniana*).

Floodplain Swamp:

Floodplain swamp is a hydric forested community that occurs within the floodplain of a creek, stream, or river. There are approximately 2,853 acres of this community type at the HHBCWMA and they are primarily found along Bull Creek, Crabgrass Creek, and their tributaries. This community has been negatively affected by the unnaturally high-water depths and long hydroperiods due to the flood control structures on the eastern side of the HHBCWMA and vegetative cover has been reduced in all strata. The most severely inundated areas have lost many trees and the canopy is sparse and unhealthy.

The floodplain swamp community at the HHBCWMA is a closed canopy system consisting of red maple, sweetgum (*Liquidambar styraciflua*), swamp tupelo, swamp laurel oak (*Quercus laurifolia*), pond cypress, bald cypress (*Taxodium distichum*), and American elm (*Ulmus americana*). The subcanopy contains the same species plus Carolina ash (*Fraxinus caroliniana*) and cabbage palm. The shrub layer is very sparse due to shading and consists of common buttonbush (*Cephalanthus occidentalis*), Virginia willow (*Itea virginica*), water locust (*Gleditsia aquatica*), wax myrtle, cabbage palm, coastalplain willow (*Salix caroliniana*), and Walter's viburnum (*Viburnum obovatum*). Epiphytes and ferns are commonly found in this community.

Hydric Hammock:

Hydric hammock is a forested community with saturated soils that commonly supports a canopy of live oak (*Quercus virginiana*) and cabbage palm. This community is intermixed with

floodplain swamp and consists of approximately 1,180 acres. At the HHBCWMA, this community is well developed and consists of a tall forest of mature trees along Bull Creek, Crabgrass Creek, and the various tributaries.

The closed canopy consists of swamp laurel oak, red maple, sweetbay magnolia, and American elm with cabbage palm being abundant in the subcanopy. Epiphytes, including bromeliads are abundant. The shrub and herbaceous layers are rather sparse with wax myrtle and blue palmetto (*Sabal minor*) although dense patches of ferns occur.

Mesic Flatwoods:

This is the most extensive community type on the HHBCWMA, totaling 11,805 acres and is an upland forest community consisting of a pine overstory of longleaf and slash pine. The pine canopy tends to be sparse and open when adjacent to scrubby flatwoods and rather dense when grading down slope towards hammock communities.

The shrub component tends to be short due to frequent fire and consists of saw palmetto, coastalplain staggerbush, fetterbush, wax myrtle, Atlantic St. Johnswort, gallberry, dwarf wax myrtle, dwarf live oak, and shiny blueberry. The herbaceous layer consists of abundant grasses including wiregrass, broomsedge bluestem (*Andropogon virginicus*), bottlebrush threeawn, witchgrass, tall elephantsfoot (*Elephantopus elatus*), and lopsided indiagrass.

Mesic Hammock:

Mesic hammocks are closed-canopy forests of temperate hardwood species occurring along wetlands or as islands within wetlands where they are sheltered from fire. There are approximately 176 acres of mesic hammock on the HHBCWMA and they often are found in the ecotone between hydric hammocks and flatwoods.

The canopy of mesic hammocks are usually closed and consist primarily of live oak, sweetgum, southern magnolia (*Magnolia grandiflora*), slash pine, swamp laurel oak, water oak (*Quercus nigra*), and cabbage palm. Epiphytes are common as well as vines. The shrub stratum is composed of yaupon (*Ilex vomitoria*), American beautyberry (*Callicarpa americana*), fetterbush, wax myrtle, coastalplain staggerbush, water oak, and saw palmetto.

Pasture – Improve and Semi-improved:

Improved and semi-improved pastures are only found on the newest addition to the HHBCWMA and only account for 28 acres. Improved pastures have been stripped of almost all native vegetation and replaced with pasture grasses. There is no overstory and apart from wax myrtle and dogfennel (*Eupatorium capillifolium*), there is little to no native vegetation present.

Semi-improved pasture is defined as an area that has been stripped of most of its native vegetation and planted in pasture grasses but still retains some natural structure. Semi-improved pasture may have some live oak and sand live oak (*Quercus geminata*) in the overstory with a shrub layer of sour orange (*Citrus x aurantium*), saw palmetto, Chapman's oak (*Quercus*

chapmanii), sand live oak (*Quercus geminata*), and cabbage palm.

Pine Plantation:

Pine plantation at the HHBCWMA is also only found on the new addition in the southwest corner. This community is defined as densely planted pine trees occurring in rows and lacking a significant or diverse assemblage of groundcover and herbaceous species. There are only approximately 9 acres of plantation that were planted in an area that was historically mesic flatwoods.

The overstory of this plantation is slash pine and there is no subcanopy or tall shrub layer. Short shrubs are sparse to moderately dense and include gallberry, fetterbush, saw palmetto, and sparkleberry (*Vaccinium arboreum*). The herbaceous layer is very sparse and lacks diversity, consisting primarily of bluestem (*Andropogon* sp.), slender flattop goldenrod (*Euthamia caroliniana*), crowngrass (*Paspalum* sp.), bracken fern (*Pteridium aquilinum*), blackroot, and queen's delight (*Stillingia sylvatica*).

Ruderal:

Ruderal communities are those where the natural community has been overwhelmingly altered due to human activity. Seven ruderal types totaling approximately 460 acres have been identified at the HHBCWMA and include clearing, ditch/canal, agriculture, developed, impoundment/artificial pond, spoil area, and abandoned field. The largest of these is the flood control berm and the associated water control structures that run along the eastern side of the HHBCWMA.

Sandhill:

There is very little sandhill at the HHBCWMA but there is a small patch of approximately 5 acres found near the cemetery. This community is characterized by a canopy of widely spaced pine trees with a sparse midstory of deciduous oaks, and a moderate to dense groundcover of grasses, herbs, and low shrubs occurring over deep sands.

The overstory of sandhill at the HHBCWMA is mature longleaf pine with a sparse subcanopy of turkey oak (*Quercus laevis*). Shrubs tend to be sparse and are represented by sand live oak, turkey oak, gopher apple, dwarf live oak, live oak, saw palmetto, shiny blueberry, and deerberry (*Vaccinium stamineum*). The herbaceous layer is dense and contains mostly wiregrass.

Scrub:

Scrub occurs on approximately 159 acres of sandy well drained soils and at the HHBCWMA, supports a vegetation assemblage characterized by scrub oaks. The majority of scrub at the HHBCWMA lacks any canopy and is best characterized by 6-15 foot tall scrub oaks intermixed with sandy openings. Areas where fire has been excluded may have some sand pine (*Pinus clausa*), slash pine, or longleaf pine in the overstory.

There are various types of tall and short shrubs scattered amongst the patches of bare sand. Shrubs found in the the HHBCWMA scrub include rusty staggerbush (*Lyonia ferruginea*), coastalplain staggerbush, fetterbush, sand pine, Chapman's oak, sand live oak, myrtle oak (*Quercus myrtifolia*), Florida rosemary (*Ceratiola ericoides*), Atlantic St. Johnswort, gopher apple, dwarf live oak, saw palmetto, shiny blueberry, and deerberry. Herbs are sparse but two rare species attest to the high quality scrub at the HHBCWMA, large-flowered rosemary (*Conradina grandiflora*) and nodding pinweed (*Lechea cernua*). Other more common species include arrowfeather threeawn (*Aristida purpurascens*), coastalplain honeycomb-head (*Balduina angustifolia*), Ware's hairsedge (*Bulbostylis warei*), coastalplain chaffhead (*Carphephorus corymbosus*), flatsedge (*Cyperus* sp.), and witchgrass.

Scrubby Flatwoods:

Scrubby flatwoods at the HHBCWMA is usually found in association with the mesic flatwoods and scrub and often occurs in isolated islands within the mesic flatwoods matrix. There are approximately 959 acres of this community type and this acreage differs from scrub in that there is a greater percent cover of saw palmetto and herbaceous groundcover than in the scrub. The overstory of the scrubby flatwoods is mainly longleaf pine but sand pine, slash pine, and sand live oak are also found. Shrubs include tarflower (*Bejaria racemosa*), rusty staggerbush, coastalplain staggerbush, fetterbush, Chapman's oak, sand live oak, myrtle oak, cabbage palm, saw palmetto, deerberry, netted pawpaw (*Asimina reticulata*), dwarf huckleberry (*Gaylussacia dumosa*), pricklypear (*Opuntia humifusa*), wild pennyroyal, winged sumac (*Rhus copallinum*), and Adam's needle (*Yucca filamentosa*). Herbs are typically sparse and tend to be dominated by wiregrass.

Wet Flatwoods:

Wet flatwoods typically have an open pine canopy with an understory of hydrophytic herbs and shrubs; there are approximately 2,059 acres at the HHBCWMA. There are two unique forms of wet flatwoods at the HHBCWMA. The first can be described as a mosaic of wet prairie interspersed with small mesic flatwood islands that are dominated by saw palmetto and occasional pines. The overstory in this type is typically longleaf pine with a subcanopy of red maple, cabbage palm, and pond cypress. Common shrubs include buttonbush (*Cephalanthus occidentalis*), gallberry, fetterbush, wax myrtle, slash pine, cabbage palm, roundpod St. Johnswort (), and peelbark St. Johnswort (*Hypericum fasciculatum*). Herbs are diverse with the dominant species being bottlebrush threeawn, wiregrass, pineland daisy (*Chaptalia tomentosa*), pink sundew (*Drosera capillaris*), maidencane (*Panicum hemitomon*), shortbristle horned beaksedge (*Rhynchospora corniculata*), sugarcane plumegrass (*Saccharum giganteum*), and bog white violet (*Viola lanceolata*).

The second type of wet flatwoods at the HHBCWMA occurs in low lying elevations that occur between floodplain systems and mesic flatwoods. These areas contain more organic soils and are currently affected by unnatural flooding events caused by the water control structures on the east side of the HHBCWMA. Cabbage palms are abundant and slash pine replaces longleaf pine in the canopy. Common shrubs include common buttonbush, common persimmon (*Diospyros virginiana*), dahoon, fetterbush, wax myrtle, coastalplain willow, saw palmetto, roundpod St.

Johnswort, peelbark St. Johnswort, St. Andrew's cross (*Hypericum hypericoides*), and gallberry. The herbaceous layer is less diverse than the other wet flatwoods type and includes blue maidencane (*Amphicarpum muhlenbergianum*), shortspike bluestem (*Andropogon brachystachyus*), bushy bluestem (*Andropogon glomeratus*), chalky bluestem (*Andropogon virginicus* var. *glaucus*), spadeleaf (*Centella asiatica*), sawgrass (*Cladium jamaicense*), slender flattop goldenrod, clustered bushmint (*Hyptis alata*), maidencane, and Virginia chain fern (*Woodwardia virginica*).

Wet Prairie:

Wet prairie is a wetland herbaceous community characterized by a seasonally high water table and frequent fire, with dense stands of grass species intermingled with high quality wetland herbaceous species; there are approximately 577 acres at the HHBCWMA. At the HHBCWMA, wet prairie commonly borders dome swamps and depression marshes. In most cases, these bordering prairie-like areas are small and often included as part of the community they fringe. Wet prairie may also form irregular and sometimes large patches within a mesic flatwoods matrix.

Wet prairie at the HHBCWMA typically lacks a canopy or contains only a few scattered longleaf pines. In areas that have been disturbed, commonly from hydrologic alterations, slash pine can be a common invader. Shrubs are sparse and include roundpod St. Johnswort, peelbark St. Johnswort, myrtleleaf St. Johnswort, fourpetal St. Johnswort, gallberry, fetterbush, wax myrtle, dwarf live oak, saw palmetto, and pond cypress. This community contains a very diverse suite of herbaceous species commonly dominated by wiregrass and to a lesser extent blue Maidencane, longleaf threeawn, bottlebrush threeawn, pineland rayless goldenrod (*Bigelovia nudata*), bearded grass-pink (*Calopogon barbatus*), pineland daisy, toothache grass (*Ctenium aromaticum*), woolly witchgrass (*Dichanthelium scabriusculum*), dwarf sundew (*Drosera brevifolia*), pink sundew, early whitetop fleabane (*Erigeron vernus*), flattened pipewort (*Eriocaulon compressum*), tenangle pipewort (*Eriocaulon decangulare*), whitehead bogbutton (*Lachnocaulon anceps*), water cowbane (*Tiedemannia filiformis*), orange milkwort (*Polygala lutea*), sugarcane plumegrass, and bog white violet. Vines are generally present in fire excluded wet prairies and may include earleaf greenbrier (*Smilax auriculata*), laurel greenbrier (*Smilax laurifolia*), and muscadine (*Vitis rotundifolia*).

BURN OBJECTIVES

Prescribed burning will be used on the HHBCWMA as a habitat management tool exclusively or in conjunction with other management techniques to accomplish a variety of objectives. The primary objective for using prescribed fire on the HHBCWMA is to restore and maintain fire-dependent native plant communities, which will result in preserving natural communities including restoration of native groundcover while simultaneously improving wildlife habitat. Creating a "checkerboard", or mosaic, of different units by altering burn frequency and season is crucial in enhancing wildlife/plant diversity and abundance. It provides areas with differing

habitat conditions for cover, brooding, and foraging throughout the year. Other objectives for the use of prescribed burning include controlling fire intensity for a more complete or “clean” burn, providing a mosaic burn when needed, and encouraging different age classes of trees throughout the unit. If time and conditions allow, staff will conduct smaller burns for management responsive species such as northern bobwhite. Smaller burns will promote a variety of habitat in a single area that northern bobwhite can use for every part of their life cycle.

Different levels of fire intensity are needed for achieving the objectives for a particular burn unit and may vary depending on current conditions. For example, creeks and swamps can be used as soft firelines with low intensity fires, while at other times they may be included in the prescription to allow high intensity fire along the edges to discourage hardwood encroachment into the flatwoods. Reducing intensity can lead to a mosaic burn, leaving burned/unburned areas which tend to maximize the “edge effect”, which is preferred by many game and nongame species. Scrubby flatwoods units would most likely display this mosaic pattern, depending on time since last fire and fuel buildup. It is important to control the intensity of the burn as much as possible to achieve the desired results and to promote diversity/abundance among flora and fauna. The maintenance of early successional ecotypes and overstory timber in some burn units is important as many species found on the HHBCWMA rely on those varying habitats. Maintaining different age classes of trees allows all types of wildlife to utilize them each according to their needs.

The primary long term goal of prescribed burning on the HHBCWMA is the long-term preservation and enhancement of native plant communities on the area. Other goals/objectives will be achieved by the implementation of the prescribed fire plan on HHBCWMA including::

- 1) Improve and maintain habitat for wildlife, emphasizing quality habitat for threatened and endangered species, by increasing the production of grasses and forbs, increasing the quality of browse, and maintaining openings for foraging and travel lanes.
- 2) Improve and maintain habitat for management responsive locally important species as outlined in the Wildlife Conservation, Prioritization and Recovery Program (WCPR) Species Management Strategy; including, but not limited to red-cockaded woodpecker, northern bobwhite, Bachman’s sparrow (*Peucaea aestivalis*), and brown-headed nuthatch (*Sitta pusilla*).
- 3) Increase diversity of flora and fauna.
- 4) Reduce hazardous fuel loads, which will help to prevent or mitigate effects of catastrophic wildfires.
- 5) Enhance aesthetics by controlling undesirable vegetation.
- 6) Control exotic plant species.
- 7) Improve public access for outdoor recreational opportunities.
- 8) Increase success of longleaf pine (*Pinus palustris*) regeneration.
- 9) Control disease and insects.
- 10) Promote nutrient cycling.

PREScribed BURNING PROGRAM

A. Firelines

Natural features (e.g. drains, creeks and swamps) and existing roads are used as firelines whenever possible. Many of the roads utilized as firelines are maintained for public access and management. Some of the less used roads, however, have re-vegetated, therefore, disking is required to maintain them as functional firelines. There are approximately 65 miles of those maintained firelines. Brush and trees will be removed so the firelines can be maintained with a tractor and disk.

B. Size and Arrangement of Units

Ninety-four burn units have been delineated on the HHBCWMA (18,814 acres total, Figure 1), averaging 200 acres in size (range: 20 - 523; Table 1). The goal at the HHBCWMA is to burn on average at least 5,000 acres per year (Table 1). Ideally, burns should be conducted at 2-3-year intervals or in consecutive years if objectives are not accomplished. Units comprised mostly of hardwood flooded forests will have a longer fire-return interval and every effort will be made, when burning, to introduce fire to the flatwoods areas within these units. Table 1 is meant to be a rough guide to follow as opposed to a strict schedule. This schedule can and will change depending on several factors. The current conditions and desired future conditions of the communities in a particular burn unit will be one of the main factors in determining actual burn rotation. The actual burning achievements in the preceding year will dictate priorities for the following year, and this depends on several factors that cannot be controlled such as weather, staffing, or other unforeseen impediments.

C. Type of Burn

Ground ignition will be used for all units and a test fire will be set first to allow the certified burn manager to initially evaluate the fire behavior. If conditions are favorable, a backfire will be used to secure the baseline, followed by flanking fires, spot fires set within the unit, and a head fire if needed. Each, or a combination of these methods, will be implemented to achieve burn objectives. All these methods and usage of them are dependent on weather factors, fuels, and topography in order to prevent damaging any forest resources. The proper techniques to use can change as these factors change.

D. Season and Time of Day

Over half of the prescribed burning of the HHBCWMA will be conducted during the growing season (April-August) with the rest of the planned burns conducted during the dormant season (December-March). Burning will be conducted primarily during daylight hours. Preferably the test fire will begin by 1000 hours and the day of burn operations will be completed by 1700 hours. Night burning will be conducted when favorable weather and atmospheric conditions exist and

are within smoke management guidelines. Growing season burns will promote more plant diversity and abundance while dormant season burns will be used for areas that may have longer return intervals and/or areas that would otherwise be underwater typically (e.g. creek and swamp edges) in the growing season.

E. Optimal Weather Conditions

For the northern part of the HHBCWMA, winds out of the north are needed for burning to keep smoke off Hwy 192. The rest of the units within the HHBCWMA can use most wind directions with little or no risk of smoke management issues. Ideal relative humidity (RH) should be between 35%-55% during the growing season or dormant season. However burns can be conducted in the 20% - 35% range with caution, and careful consideration of current conditions. Surface winds of 5 – 10 mph are ideal for either season. Any wind below 15 mph is acceptable however. Transport winds for either season should be greater than 5 mph and most directions are acceptable. Chances of precipitation are unpredictable during the growing season due to sea breezes and the formation of spontaneous thunderstorms. Being able to secure the burn in case of bad weather approaching (e.g. erratic winds from a thunderstorm) is crucial to a successful burn. However, a good burn can be attained even when rain chances are as high as 70%. Getting the burn completed in a timely manner increases the chance for rain to assist in the mop-up process.

Burning requires careful planning and should include an early start as soon as on the ground conditions permit especially during higher precipitation days. Fortunately, once rainfall passes it can create optimal burning conditions for several days with as little as 1 inch of rain during the growing season. In the dormant season good burning conditions can also exist for several days after the passage of a cold front that has brought .25 inches to .75 inches of rain, assuming winds and RH conditions are appropriate. Conditions are much more persistent during that time of year with typical clear sunny days. Regardless, either season requires enough rainfall to produce ideal burning conditions. Sufficient moisture levels with a particular unit that is due for burning will require an on the ground check (e.g. checking available water in swamps and strands). The dispersion index (DI) during daylight in either season should be in the 15-60 range, anything above this range becomes unpredictable as the atmosphere becomes unstable, below 15 atmospheric conditions are stagnant and could lead to smoke management issues. However burning can be conducted up to 80, but only if other conditions exist such as recent rainfall, higher RH, lighter winds, or burning into a recently burned area. At night DI should be ≥ 3 . The mixing height should be at least 1700 feet during either season; however, during the growing season typical conditions have a mixing height of 4-6 thousand feet and the dormant season will have a mixing height of 2-4 thousand feet. The Keetch/Byram Drought Index ranges from 0-800, ideal conditions are between 150-600. However, if all other conditions are within acceptable ranges, burning can occur above or below that range. Again, on the ground check of conditions will need to be conducted by the certified burn manager prior to the burn and only they can determine if conditions

are good enough to conduct the burn. If burning during times of higher KBDI values additional monitoring after the burn will be necessary to ensure no long term negative effects (ie. ignition of duff/muck layers, or 100 and 1000-hour fuels near firelines). Fine fuel moisture should be greater than 6%.

F. Smoke Management

In addition to controlling the burn, smoke management may be considered the most critical element of using prescribed fire. Direction, volume and dissipation of smoke from prescribed burning on the HHBCWMA is of primary 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 Hwy 192, Crabgrass Road, Deseret Ranch, Kempfer Ranch, and the residents located in or around these areas such as Holopaw Estates. To minimize smoke problems, burning should be conducted when the atmosphere is slightly unstable, with a minimum mixing height of 1,700 feet and transport wind speed of 9 mph or more. Due to their low fuel loads and long distance from smoke sensitive areas, many units on HHBCWMA can be burned when mixing height and transport wind speed are below these values. Residual smoke problems, such as stumps, snags, or logs, will be promptly mopped-up and monitored to minimize smoke hazards on every burn. Overall, atmospheric conditions cannot be controlled but the smoke effects of prescribed burning must be controlled.

G. Personnel

At current staffing levels, all of the burning can be safely accomplished using personnel from the HHBCWMA, the TNRWMA, the T.M. Goodwin Waterfowl Management Area (TMGWMA), and the Three Lakes Wildlife Management Area (TLWMA). In the event that a future need arises, personnel from other state agencies such as the Florida Forest Service (FFS) and St Johns River Water Management District (SJRWMD) may be used. Under ideal conditions, burning can be conducted with a crew of 4 to 7. Generally, ignition will be conducted by 2-3 crew members, 1 crew member will monitor and suppress (pump truck) and 3 other crew members will be coordinated to manage the acreage to be burned that day (monitoring, igniting, mop-up, fill in gaps). Smaller or larger crews will be needed depending on the size and complexity of a burn unit, fuel loads in the unit, burn history of adjacent units, proximity to smoke sensitive areas or the WMA boundary, mop-up requirements, and weather conditions.

H. Equipment

Equipment will be utilized from the HHBCWMA, the TNRWMA, and the TLWMA, and the type and quantity of fire equipment necessary will be determined by the certified burn manager. All personnel will have proper PPE, hand-held radios, and access to fire flaps, fire rakes, shovels, drip torches, burn fuel, chainsaws, ATVs with water tanks, trucks with water tanks, and pump trucks with these various tools available to them. Specifically, the HHBCWMA has 1 tractor with a 200 gallon, 3-point Wick pump capable of drafting, one Type VI

brush truck with a 500 gallon water tank equipped with foam also able to draft, a 300 gallon water tank slip-in available in another truck, a UTV with a 100 gallon water tank, and a dozer with a fire plow can be on stand-by and used if necessary. The HHBCWMA personnel each has an ATV with drip torches, chain saw, fire shelter and a 15 gallon water tank with foam. Smoke caution signs for Highway 192 and fire hazard signs will be deployed as necessary.

I. Permits and Notifications

A permit will be obtained from the FFS on the morning of the burn. Notification of burning will be given to personnel at the TNRWMA, the TMGWMA, the TLWMA, and the FWC Northeast Region Office. . When burning adjacent to private or other agency property, efforts will be made to notify landowners or the other managing agency. The FFS can notify other agencies of the burn if necessary (Osceola Co. Sheriff Dept., Osceola Co. Fire Dept.).

J. Evaluation of Burn

The certified burn manager will note fire behavior, flame length, fire intensity and smoke dispersion. Initial evaluation of the fire will be conducted with special consideration of these observations when determining if the burn met outlined objectives. Based on the burn evaluation, modifications to techniques and acceptable conditions will be adjusted for future burns if needed. During the ignition and burnout phases of each burn weather parameters and fire behavior will be continually observed for compliance with the prescribed parameters. A contingency plan will be a part of every burn plan that will inform decision making and actions should weather conditions or fire behavior become out of prescription during the burn. Post burn monitoring will involve evaluating the results of the burn to determine if the measurable burn objectives were met, and then comparing these results against the prescribed parameters. Vegetation monitoring via OBVM will provide long term data to inform the area manager of the natural communities' condition compared to the DFC. These data also will allow the manager to make adjustments to the burn regime so that the DFC can be met or maintained. Various wildlife surveys will determine whether WCPR locally important species are using the area and their response to management activities. These surveys include, but are not limited to, breeding bird point counts, Northern bobwhite fall covey counts, red-cockaded woodpecker nesting/reproductive surveys, and opportunistic observations.

K. Special Considerations

Attention will be given to the safety of private landowners and their property. Firelines will be maintained in those areas and fire behavior will be monitored closely as burns are conducted around their vicinities. Wind direction-that sends

smoke away from private landowners will be preferred. Units along the WMA boundary need to be evaluated several months in advance of a burn to assess where and to what extent mechanical treatments are needed prior to the burn to reduce the risk of a spot-over outside the WMA boundary. Units with red-cockaded woodpecker trees will receive individual prepping and burning to prevent tree scorching. Lastly the levy on the eastern side of the property has power lines that run parallel to it. Great effort will be placed on reducing smoke along the power lines as to not allow arcing of electricity.

Table 1. Unit number, size, and 15 year schedule of burn units for the HHBCWMA.

Unit	Acres	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15
1	227	227	-	-	227	-	-	227	-	-	227	-	-	227	-	-
3	245	-	245	-	-	245	-	-	245	-	-	245	-	-	245	-
4	52	-	52	-	-	52	-	-	52	-	-	52	-	-	52	-
5	146	-	-	146	-	-	146	-	-	146	-	-	146	-	-	146
6	203	-	203	-	-	203	-	-	203	-	-	203	-	-	203	-
7	463	-	463	-	-	463	-	-	463	-	-	463	-	-	463	-
8	55	-	-	55	-	-	55	-	-	55	-	-	55	-	-	55
9	61	61	-	-	61	-	-	61	-	-	61	-	-	61	-	-
10	234	234	-	-	234	-	-	234	-	-	234	-	-	234	-	-
11	145	-	-	145	-	-	145	-	-	145	-	-	145	-	-	145
13	490	490	-	-	490	-	-	490	-	-	490	-	-	490	-	-
14	302	302	-	-	302	-	-	302	-	-	302	-	-	302	-	-
15	41	-	-	41	-	-	41	-	-	41	-	-	41	-	-	41
16	243	-	243	-	-	243	-	-	243	-	-	243	-	-	243	-
18	523	-	523	-	-	523	-	-	523	-	-	523	-	-	523	-
19	207	-	207	-	-	207	-	-	207	-	-	207	-	-	207	-
20	23	-	-	23	-	-	23	-	-	23	-	-	23	-	-	23
21	186	-	186	-	-	186	-	-	186	-	-	186	-	-	186	-
22	20	20	-	-	20	-	-	20	-	-	20	-	-	20	-	-
23-N	194	-	-	194	-	-	194	-	-	194	-	-	194	-	-	194
23-S	424	-	424	-	-	424	-	-	424	-	-	424	-	-	424	-
24	328	328	-	-	328	-	-	328	-	-	328	-	-	328	-	-
25	412	-	-	412	-	-	412	-	-	412	-	-	412	-	-	412
26	36	-	-	36	-	-	36	-	-	36	-	-	36	-	-	36
27	53	-	-	53	-	-	53	-	-	53	-	-	53	-	-	53
28	315	315	-	-	315	-	-	315	-	-	315	-	-	315	-	-

29	347	347	-	-	-	347	-	-	-	347	-	-	-	347	-	-
30	465	465	-	-	465	-	-	465	-	-	465	-	-	465	-	-
31	235	-	235	-	-	235	-	-	235	-	-	235	-	-	235	-
32	88	-	88	-	-	88	-	-	88	-	-	88	-	-	88	-
33	201	-	201	-	-	201	-	-	201	-	-	201	-	-	201	-
34	256	-	-	256	-	-	256	-	-	256	-	-	256	-	-	256
35	112	-	112	-	-	112	-	-	112	-	-	112	-	-	112	-
36	121	121	-	-	121	-	-	121	-	-	121	-	-	121	-	-
37	113	113	-	-	113	-	-	113	-	-	113	-	-	113	-	-
38	181	181	-	-	181	-	-	181	-	-	181	-	-	181	-	-
39	88	88	-	-	88	-	-	88	-	-	88	-	-	88	-	-
40	30	-	30	-	-	30	-	-	30	-	-	30	-	-	30	-
41	324	-	324	-	-	324	-	-	324	-	-	324	-	-	324	-
42	88	88	-	-	88	-	-	88	-	-	88	-	-	88	-	-
43	20	-	20	-	-	20	-	-	20	-	-	20	-	-	20	-
44	225	225	-	-	225	-	-	225	-	-	225	-	-	225	-	-
45	364	364	-	-	364	-	-	364	-	-	364	-	-	364	-	-
46	124	-	124	-	-	124	-	-	124	-	-	124	-	-	124	-
47	229	-	229	-	-	229	-	-	229	-	-	229	-	-	229	-
49	471	-	471	-	-	471	-	-	471	-	-	471	-	-	471	-
50	219	-	-	219	-	-	219	-	-	219	-	-	219	-	-	219
51	41	-	-	41	-	-	41	-	-	41	-	-	41	-	-	41
52	291	-	-	291	-	-	291	-	-	291	-	-	291	-	-	291
53	374	-	374	-	-	374	-	-	374	-	-	374	-	-	374	-
54	436	436	-	-	436	-	-	436	-	-	436	-	-	436	-	-
57	150	-	-	150	-	-	150	-	-	150	-	-	150	-	-	150
58	264	-	-	264	-	-	264	-	-	264	-	-	264	-	-	264
60	161	161	-	-	161	-	-	161	-	-	161	-	-	161	-	-
6162	188	-	188	-	-	188	-	-	188	-	-	188	-	-	188	-
63	98	98	-	-	98	-	-	98	-	-	98	-	-	98	-	-

64	127	-	-	127	-	-	127	-	-	127	-	-	127	-	-	127
65	47	47	-	-	47	-	-	47	-	-	47	-	-	47	-	-
67	32	32	-	-	32	-	-	32	-	-	32	-	-	32	-	-
68	76	76	-	-	76	-	-	76	-	-	76	-	-	76	-	-
69	25	25	-	-	25	-	-	25	-	-	25	-	-	25	-	-
70	507	-	-	-	507	-	-	507	-	-	507	-	-	507	-	-
71	110	-	110	-	-	110	-	-	110	-	-	110	-	-	110	-
72	26	-	26	-	-	26	-	-	26	-	-	26	-	-	26	-
73	387	-	-	387	-	-	387	-	-	387	-	-	387	-	-	387
74	40	40	-	-	40	-	-	40	-	-	40	-	-	40	-	-
77	212	212	-	-	212	-	-	212	-	-	212	-	-	212	-	-
78	452	452	-	-	452	-	-	452	-	-	452	-	-	452	-	-
79-E	29	-	-	29	-	-	29	-	-	29	-	-	29	-	-	29
79-W	44	-	44	-	-	44	-	-	44	-	-	44	-	-	44	-
80	165	165	-	-	165	-	-	165	-	-	165	-	-	165	-	-
81-E	23	-	-	23	-	-	23	-	-	23	-	-	23	-	-	23
81-W	75	-	-	75	-	-	75	-	-	75	-	-	75	-	-	75
82	115	-	-	115	-	-	115	-	-	115	-	-	115	-	-	115
83	91	-	91	-	-	91	-	-	91	-	-	91	-	-	91	-
84	373	-	-	373	-	-	373	-	-	373	-	-	373	-	-	373
85	275	275	-	-	-	275	-	-	-	275	-	-	-	275	-	-
86	196	-	-	196	-	-	196	-	-	196	-	-	196	-	-	196
88	249	249	-	-	249	-	-	249	-	-	249	-	-	249	-	-
90	192	-	192	-	-	-	192	-	-	-	192	-	-	-	192	-
101	255	-	255	-	-	255	-	-	255	-	-	255	-	-	255	-
102	243	-	243	-	-	243	-	-	243	-	-	243	-	-	243	-
103	170	-	-	170	-	-	170	-	-	170	-	-	170	-	-	170
104	283	283	-	283	-	-	283	-	-	283	-	-	283	-	-	283
105	323	-	323	-	-	323	-	-	323	-	-	323	-	-	323	-
106	141	-	-	141	-	-	141	-	-	141	-	-	141	-	-	141

107	60	-	60	-	-	-	60	-	-	-	60	-	-	-	60	-
108	91	-	-	-	91	-	-	91	-	-	91	-	-	91	-	-
110	523	523	-	523	-	-	523	-	-	523	-	-	523	-	-	523
111	151	151	-	-	151	-	-	151	-	-	151	-	-	151	-	-
112	219	-	-	-	219	-	-	219	-	-	219	-	-	219	-	-
113	36	36	-	-	36	-	-	36	-	-	36	-	-	36	-	-
114	501	501	-	501	-	-	501	-	-	501	-	-	501	-	-	501
Camp	22	22	-	22	-	22	-	22	-	22	-	22	-	22	-	22
TOTAL	18814	7753	6286	5291	6619	6678	5521	6641	6034	5913	6871	6056	5269	7263	6286	5291

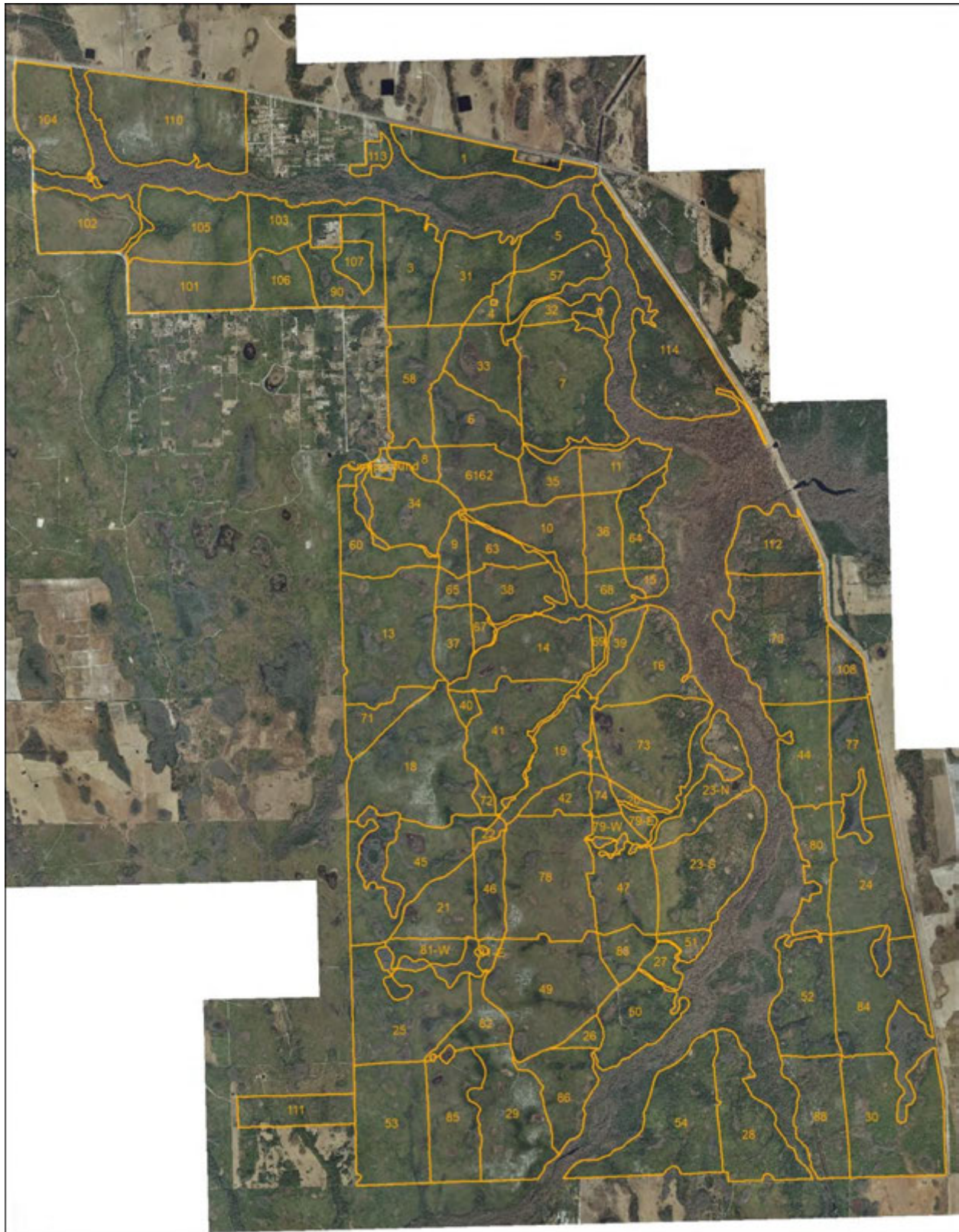


Figure 1. The map depicts the 94 burn units on the HHBCWMA, totaling 18,814 acres.

**12.13 Wildlife Conservation, Prioritization and Recovery Program Strategy
(WCPR)**

Herky Huffman/Bull Creek WMA and Triple N Ranch WMA Species Management Strategy

Original – 9/28/2012

Revised – 7/15/2015

Florida Fish and Wildlife Conservation Commission Wildlife and
Habitat Management Section
Produced by the Wildlife Conservation,
Prioritization and Recovery Program



Explanation of Revisions

The Herky Huffman/Bull Creek WMA (HHBCWMA) and Triple-N-Ranch WMA (TNRWMA) Species Management Strategy was finalized in 2012. In 2015, staff revised the Strategy to address the internal relocation of gopher tortoises (*Gopherus polyphemus*) on TNRWMA, and to document the management and monitoring associated with the relocation. FWC’s Gopher Tortoise policy team, Division of Hunting and Game Management (HGM), Division of Habitat and Species Conservation (HSC), Wildlife and Habitat Management Section (WHM) staff have provided input and oversight during the revision process ([Section 6.1.1](#)). In addition to the proposed changes, all hyperlinks and agency contacts have been updated to reflect the most current information available.

Changes to the “Management and Monitoring Since State Acquisition – TNRWMA” synopsis ([Section 2.3](#)) include the documentation of 40 acres of property undergoing ground cover restoration (GCR) that has been identified as a recipient site for the on-site relocation of tortoises on the property. Changes to the species assessment for gopher tortoise ([Section 3.2.4](#)) include the relocation of 14 tortoises to the recipient area, located adjacent to US 441 on the west side of the property. The text of the assessment was modified to address the management, species monitoring, and habitat monitoring of the recipient area as required by the permitting guidelines for the relocation of gopher tortoises. The need for a Gopher Tortoise Recipient Site Strategic Management Area (SMA) was identified and inserted ([Section 4.1.3](#)), and we amended [Section 5.2.2](#) to describe recommendations for monitoring the gopher tortoise recipient site.

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 assessments of a number of focal species. Staff combines these assessments with management considerations to develop a wildlife management strategy for the area. 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 Herky Huffman/Bull Creek Wildlife Management Area (HH/BCWMA) and Triple N Ranch Wildlife Management Area (TNRWMA). Natural community management designed for 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 wildlife conservation benefit, staff considers the role of the WMA 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 properties.

[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 that were identified for the gopher frog, gopher tortoise, Bachman's sparrow, brown-headed nuthatch, northern bobwhite, and red-cockaded woodpecker.

[Section 4](#) describes specific land management actions recommended for focal species. Staff identified the need for a Strategic Management Area (SMA) on HH/BCWMA to investigate the potential for enhancement or restoration of Bull Creek. Another SMA spanning both WMAs was identified for the creation of additional red-cockaded woodpecker recruitment clusters. Staff also identified an SMA for a Gopher Tortoise Recipient Site on TNRWMA. Staff also recommended a change to Objective-Based Vegetation Management (OBVM) considerations for assessing pine seedlings within mesic flatwoods. This section also discusses management considerations necessary to ensure continued persistence of focal species.

[Section 5](#) describes species-specific management and monitoring that is prescribed for the area, and identifies any research that would be necessary to guide future management efforts. For this area, we discuss species management actions for the red-cockaded woodpecker.

Monitoring is recommended for the gopher frog, gopher tortoise, Bachman's sparrow, brown-headed nuthatch, northern bobwhite, and red-cockaded woodpecker. Opportunistic documentation of encounters with other focal species is recommended.

[Section 6](#) identifies coordination that will assist in conserving these focal species. We identify coordination with 7 other units in FWC and inter-agency coordination with 5 other entities.

[Section 7](#) describes efforts that should 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. 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

AC	Active Cluster
AHREs	Aquatic Habitat Restoration / Enhancement Subsection
ARCI	Avian Research and Conservation Institute
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
FWC	Florida Fish and Wildlife Conservation Commission
FWLI	Florida's Wildlife Legacy Initiative
FWRI	Fish and Wildlife Research Institute
HGM	Hunting and Game Management (section)
HH/BCWMA	Herky Huffman / Bull Creek Wildlife Management Area
ISM	Imperiled Species Management (section)
MU	Management Unit
NC	Natural Community
OBVM	Objective-Based Vegetation Management
PBG	Potential Breeding Group
PLCP	Public Lands Conservation Planning (project)
PVA	Population Viability Analysis
SCP	Species Conservation Planning (section)
SJRWMD	Saint Johns River Water Management District
SMA	Strategic Management Area
TLWMA	Three Lakes Wildlife Management Area
TNRWMA	Triple N Ranch Wildlife Management Area
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 Report, 2008		Legacy Initiative		PVA on managed lands	
	Bio- logical Score ¹	Supple- mental Score ²	Popu- lation Status ³	Popu- lation Trends ⁴	Proba- bility of a 50% decline ⁵	Populations persisting (to 80 or 100 years) ⁶
Gopher Frog	24.6	12	med ⁷	decl	0	9% (to 80)
Eastern Indigo Snake	24.7	16	low	decl	N/A	N/A
Florida Pine Snake	23.7	15	med	decl	0	31% (to 80)
Gopher Tortoise	27.3	17	med	decl	0	55% (to 100)
Swallow-tailed Kite	25.7	13	low	unk	20%	50% (to 100)
Bachman's Sparrow	16.0	12	med	decl	0	49% (to 80)
Brown Headed Nuthatch	17.0	13	med	decl	0	25% (to 80)
Burrowing Owl	15.3	15	med	unk	>90%	6% (to 100)
Cooper's Hawk	15.0	12	not a SGCN ⁸	not a SGCN	96%	100% (to 100)
Crested Caracara	37.7	17	low	unk	0	100% (to 100)
Florida Grasshopper Sparrow	39.7	18	low	decl	100%	12% (to 100)
Florida's Mottled Duck	17.3	18	med	decl	1%	100% (to 100)
Florida Sandhill Crane	27.0	16	med	decl	0	33 % (to 80)
Limpkin	24.3	14	med	unk	0	100% (to 100)
Northern Bobwhite	11.0	14	low	decl	0	100% (to 100)
Red-cockaded Woodpecker	27.6	14	low	decl	0	45% (to 100)

Species Common Name	Millsap Report, 2008		Legacy Initiative		PVA on managed lands	
	Bio- logical Score ¹	Supple- mental Score ²	Popu- lation Status ³	Popu- lation Trends ⁴	Proba- bility of a 50% decline ⁵	Populations persisting (to 80 or 100 years) ⁶
Short-tailed Hawk	30.6	15	low	unk	61%	50% (to 100)
Snail Kite	50.0	17	low	decl	0	100% (to 100)
Southern Bald Eagle	21.3	10	med	inc ⁷	0	100% (to 100)
Wading Birds	23.7	13	n/a	n/a	0	100% (to 100)
Florida Black Bear	32.7	13	med	stbl ⁷	5%	100% to (100)
Florida Panther	40.3	15	low	unk	0	100% (to 100)
Sherman's Fox Squirrel	24.0	17	low	decl	0	28% (to 80)

¹ Species trigger this parameter if the score is ≥ 25.9

² Species trigger this parameter if the score is ≥ 15

³ Species trigger this parameter if the score is \geq low or unknown (unk)

⁴ Species trigger this parameter if the score is \geq declining (decl) or unknown (unk)

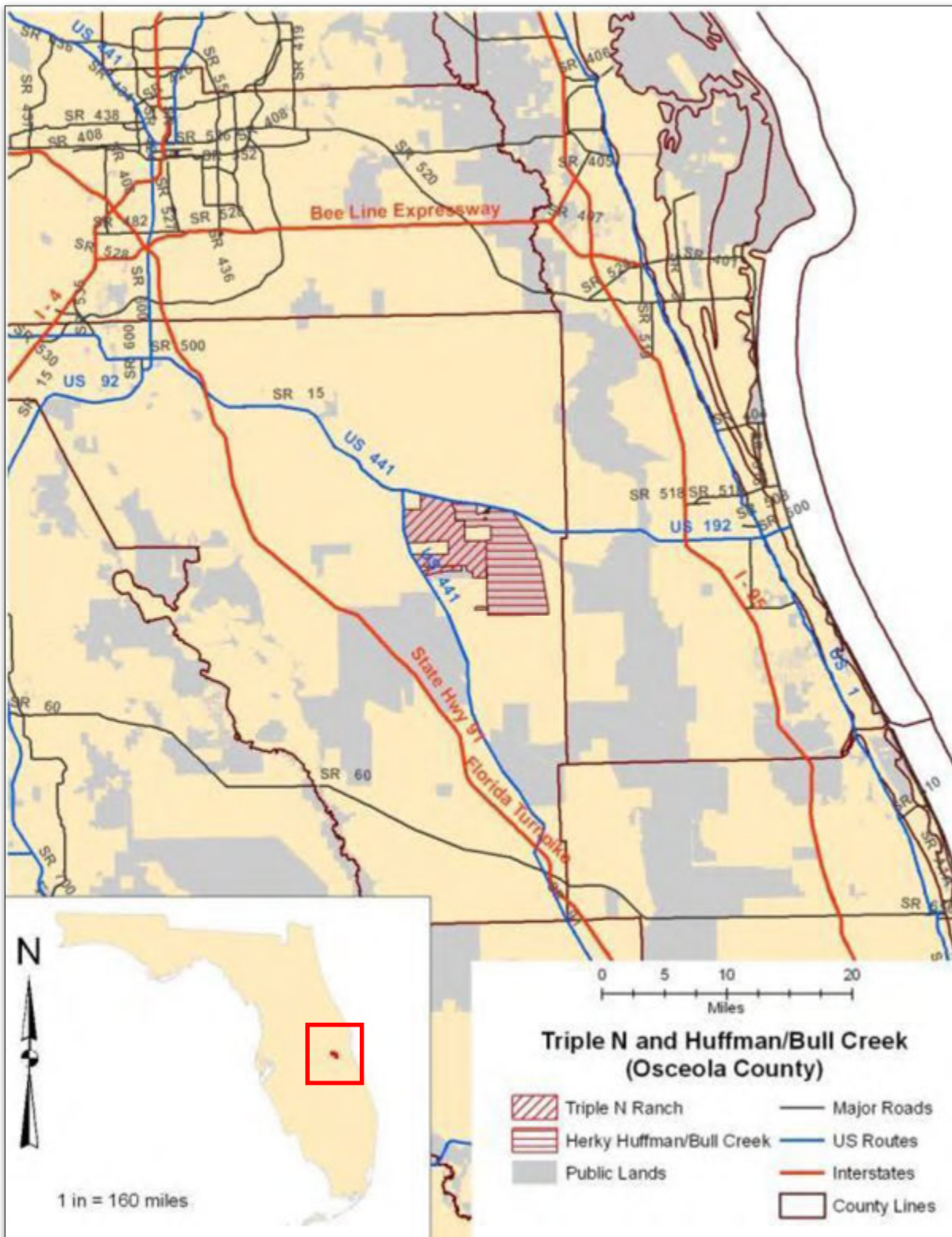
⁵ Species trigger this parameter if the score is > 0

⁶ Species trigger this parameter if the score is $\leq 75\%$

⁷ med = medium; inc = increasing; stbl = stable

⁸ SGCN = species of greatest conservation need

Locator Map



Section 1: Introduction

The FWC takes a proactive, science-informed approach to species management on lands in the WMA/WEA system. Staff integrates conservation planning, Population Viability Analysis (PVA) results, and geospatial analytical techniques to model potential habitat for FWC focal species conservation. We then combine the landscape level assessments with input from species experts and people with knowledge of the area to create site-specific wildlife assessments for a number of focal species. Finally, staff combines these assessments with management considerations to develop a wildlife management strategy for the area or WMA complex.

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 and facilitate 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. Staff considered the goals and objectives included in the Management Plan (formerly known as Conceptual Management Plan) when discussing and assessing the species; therefore, this Strategy will help guide and support the goals of the Management Plan. The species-specific objectives identified in this Strategy will be incorporated into the Management Plan and this Strategy will be appended to the Management Plan.

In this document, we define goals, objectives and strategies as follows: 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. Strategies are the actions that will be taken to accomplish a goal or objective.

The process to develop an area's Strategy consists of the following steps. First, staff used species-specific habitat models to create statewide potential habitat maps. Then, staff conducted a GIS analysis to determine which of the focal species were modeled have potential habitat on HH/BCWMA and TNRWMA. To prepare for the workshop, we combined local staff knowledge, species-expert knowledge, and area-specific maps of natural communities to refine habitat information for each focal species. Next, we conducted a workshop at which individuals evaluated the area's potential role in conservation of the species. This included discussing the focal species' status, evaluating opportunities for land and species management, and deciding on appropriate monitoring and research actions.

Discussion during the workshop also involved identifying intra- and interagency coordination, and any "beyond the boundary" considerations (e.g., working with neighboring landowners) necessary for the management of species. Workshop participants agreed upon area-specific species objectives, a list of necessary actions to achieve these objectives, and the monitoring necessary to verify progress towards objectives. After the workshop, a wildlife Strategy is developed considerate of the notes from the workshop. Staff sends the draft Strategy to species experts and workshop attendees for review prior to finalizing the document.

While this Strategy focuses on the HH/BCWMA and TNRWMA, it considers the role of these areas within the larger state or regional context. Similarly, while the Strategy has species-specific objectives and actions, it does not endorse single-species management. The FWC's land management focuses on natural community management that benefits the host

of species that naturally occur in each natural community. However, some species may need directed actions to recover from past declines, or to be restored to formerly occupied habitat. By implementing the Strategy, 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: Historic, Current and Planned Management on Herky Huffman Bull Creek and Triple N Ranch Wildlife Management Areas

2.1: Location, Acquisition, and Influences on Current Condition

Herky Huffman/Bull Creek WMA - In 1967, the Central and Southern Florida Flood Control District purchased the approximately 23,350 acres that became HH/BCWMA. A lease with the Florida Game and Fresh Water Fish Commission (predecessor to the FWC) in 1970 established the property as Bull Creek WMA. In 1977, the land was transferred to the Saint Johns River Water Management District (SJRWMD). The SJRWMD acquired the property to serve as a water detention basin to ensure water supply for navigation, and as a storage area for flood protection. Over time, the responsibilities of SJRWMD for HH/BCWMA expanded to include management and protection of the property's ecological function, and to promote public recreation. In 2010, the SJRWMD transferred management authority for Bull Creek WMA to FWC through a lease agreement. The agencies renamed the WMA the Herky Huffman / Bull Creek WMA in 2010 in memory of former FWC commissioner, Herky Huffman. While FWC has had staff dedicated to management on HH/BCWMA since 1970, the lease transfer effectively made FWC the lead management agency for the site. Additional acres added to HH/BCWMA from the purchase of TNRWMA have brought the total acreage to approximately 23,479.

The HH/BCWMA shares its western boundary with TNRWMA, is connected to the Three Forks Marsh Conservation Area to the east via a conservation easement, and exists in a portion of Florida that has several large pieces of conservation land. Private lands around the WMA generally consist of large tracts utilized for cattle grazing or citrus production.

The HH/BCWMA has several archeological sites, including two non-permanent hunting camps utilized by the Tonycua Indians between 5000 and 3000 B.C. One of the earliest settlers, George W. Hopkins, purchased 104,000 acres in 1902; and HH/BCWMA exists within a portion of this purchase area. Completion of Henry Flagler's east coast railroad to Melbourne opened the area to northern timber markets. On the property that became HH/BCWMA, timber harvests began in 1912 and concluded by 1928. There were no active reforestation efforts. Because of this past management, there are large portions of the property without trees, or with a limited number of trees. This complicates natural community management because it is difficult to distinguish areas of true dry prairie from areas of mesic flatwoods with no pine canopy.

Triple N Ranch WMA - The FWC and SJRWMD acquired the original 8,893-acre Triple N Ranch using Save Our River funds in November 1994. TNRWMA was purchased as an addition to the SJRWMD's Bull Creek Project and was the first tract acquired within the Conservation And Recreation Lands Program's Osceola Pine Savannas project boundary. One of the purposes for acquisition was to ensure the persistence of prairie wildlife species such as the swallow-tailed kite and crested caracara. Additionally, the

purchase allowed the public access to a large area for hunting, wildlife observation, and other outdoor activities. FWC established the tract as the TNRWMA in July 1995. Additional purchases, including the McNamara tract, the Equitable tract, the Yates tract, and the Vanosdol tract, increased TNRWMA to approximately 16,350 acres.

The TNRWMA shares its eastern boundary with HH/BCWMA, lies roughly 4 miles north of Three Lakes Wildlife Management Area (TLWMA), and exists in a portion of the state with several large pieces of conservation land. Private lands around the WMA generally consist of large tracts utilized for cattle grazing or citrus production.

Previous landowners used much of the Osceola Pine Savannas for grazing cattle on native groundcover. On much of the property throughout this region, including TNRWMA, the level and duration of grazing is believed to have been low, as damage to native groundcover was minimal. Beginning in the 1960s, native groundcover or “native range” in Osceola County was reduced from 333,000 acres to 127,000 acres. This conversion to non- native sod-forming grasses has continued to occur, which makes TNRWMA’s intact natural communities particularly unique. Wiregrass (*Aristida stricta*) remained prevalent on the WMA when it was originally acquired, which suggests the previous owners regularly burned the property.

Extensive logging occurred during the 1920s-30s to provide timber to a mill located in Holopaw, just north of the WMA. Cypress (*Taxodium* sp.) harvesting occurred throughout Osceola County, including on TNRWMA (particularly the southern portion). Currently, TNRWMA’s flatwoods contain a sparse canopy of longleaf pine (*Pinus palustris*) with pockets of young saplings. The continued use of frequent, low-intensity prescribed fire in these areas should allow for the eventual use of uneven-aged forest management. Portions of the Equitable tract were used for citrus production and remained in this condition upon acquisition by the state.

2.2: Management and Monitoring Since State Acquisition – HH/BCWMA

The Florida Natural Areas Inventory (FNAI) completed current and historic plant community mapping at HH/BCWMA as part of FWC’s OBVM program ([Table 1](#)). Through the OBVM workshop process, staff delineated management units (MUs) and defined the desired future conditions (DFCs) for the actively managed natural communities. Fortunately, much of HH/BCWMA’s natural communities remain in good condition with intact groundcover. The primary land management tool utilized on the property is prescribed fire, which is the most cost-effective means to enhance and maintain natural communities. There are approximately 17,832 acres of fire-dependent communities on HH/BCWMA. Staff plans to burn an average of 7,000 acres/year with a running average of 5,500 acres/year actually burned. In MUs with herbaceous groundcover below desired levels, staff uses roller-chopping in concert with prescribed fire to reduce palmetto height and density, thereby encouraging groundcover growth. Although HH/BCWMA is fortunate in that it has a limited amount of exotic invasive plant species, chemical control of cogon grass (*Imperata cylindrica*) and old world climbing fern (*Lygodium microphyllum*) occurs opportunistically as staff detect these species.

Recreational activities occurring on HH/BCWMA include hiking, horseback riding, bird watching, and hunting. Hunts on HH/BCWMA occur during all of FWC’s major

hunting seasons. The WMA's main roads remain open to the public at all times and a campground is located at the main entrance and check station. Current wildlife monitoring by FWC on HH/BCWMA includes annual spotlight surveys for white-tailed deer (*Odocoileus virginianus*) and an ongoing population study of red-cockaded woodpeckers. Staff implemented a fall covey count for Northern Bobwhite in 2011 and produced an estimate of 1 bird per 1.9 acres. White-tailed deer populations remain stable and continue to provide good hunting opportunities. [Section 3.2.15](#) contains detailed information on the status of red-cockaded woodpeckers on HH/BCWMA. Current staff for the 23,479-acre property include one Biological Scientist III and one Biological Technician. Because HH/BCWMA and TNRWMA are contiguous and staffing levels are low, staff from both WMAs work together to efficiently manage the properties. Given this, management on either WMA would be hampered without the resources from the other WMA.

Table 1. Mapped acreage of current and historic plant communities on HH/BCWMA, including management status and number of focal species that use the community.

Natural Community	Estimated Current Acres	Estimated Historic Acres	Actively Managed ¹	# of Focal Species That Use the NC
Baygall	285	159		2
Depression Marsh	967	1,176		5
Dome Swamp	1,429	1,329		5
Dry Prairie	528	530	Yes	9
Floodplain Swamp	2,853	2,746		6
Hydric Hammock	1,179	1,198		4
Mesic Flatwoods	11,805	12,316	Yes	14
Mesic Hammock	176	20		5
Pasture – Improved	26	0		11
Pasture – Semi-improved	2	0		11
Pine Plantation	9	0		7
Ruderal	460	0		11
Sandhill	5	5	Yes	12
Scrub	160	160	Yes	4
Scrubby Flatwoods	959	1,237	Yes	8
Wet Flatwoods	2,059	1,961	Yes	8
Wet Prairie	577	642	Yes	5
TOTAL ACRES	23,479	23,479		

¹ Communities that are actively managed and will be monitored via the OBVM process. Other communities are managed, but will not be monitored via OBVM.

2.3: Management and Monitoring Since State Acquisition – TNRWMA

The FNAI completed plant community mapping at TNRWMA as part of FWC's OBVM program ([Table 2](#)); however, due to the relatively intact condition of the natural

communities, historic plant community mapping was not done. Through the workshop process, staff delineated MUs and defined the DFCs for the actively managed natural communities.

Table 2. Mapped acreage of current plant communities on TNRWMA, including management status and number of focal species that use the community.

Natural Community	Acreage mapped	Actively Managed ¹	# of Focal Species That Use the NC
Baygall	206		2
Depression Marsh	749		5
Dome Swamp	2,204		5
Dry Prairie	479	Yes	9
Hydric Hammock	829		4
Mesic Flatwoods	7,988	Yes	14
Mesic Hammock	49		5
Pasture – Improved	1,169		11
Pasture – Semi-improved	94		11
Ruderal	850		11
Scrub	43	Yes	4
Scrubby Flatwoods	311	Yes	8
Wet Flatwoods	324		8
Wet Prairie	1,046	Yes	5
Xeric Hammock	5		6
TOTAL ACRES	16,346		

¹ Communities that are actively managed and will be monitored via the OBVM process. Other communities are managed, but will not be monitored via OBVM.

As with HH/BCWMA, prescribed fire is the main management tool staff uses to enhance and maintain natural communities on TNRWMA. Groundcover is generally in good to excellent condition throughout the area's fire-dependent natural communities. TNRWMA has approximately 10,931 acres of fire-dependent natural communities, and roughly 1,457 acres of ruderal and improved pasture that experience occasional prescribed fire. Staff plans to burn 6,000 acres annually and have burned an average of 5,888 acres annually over the last 5 years. In addition to prescribed fire, staff uses roller-chopping as a management tool to reduce palmetto cover where necessary. To date, staff have roller-chopped over 2,000 acres. Grazing occurs on 9,103 acres of native range on TNRWMA. The current grazing contract allows for up to 130 cattle grazing units (defined as a cow and her offspring) on the designated area. To prevent the spread of tropical soda apple (*Solanum viarum*), all cattle must be quarantined for 6 days prior to being released onto TNRWMA. Exotic plants are sparse on northern portions of the property, and more prevalent within the ruderal areas on the southern portions. Staff aggressively treats cogon grass, old-world climbing fern, Brazilian pepper (*Schinus terebinthifolius*), tropical soda apple, Australian pine (*Casuarina equisetifolia*), melaleuca (*Melaleuca quinquenervia*), and torpedo grass (*Panicum repens*).

Habitat restoration is needed on the acres that have been completely altered. In 2007, staff began restoration of mesic flatwoods that had been converted to citrus by previous landowners. All canals and beds were restored to original topography, and staff initiated planting 88 acres in native groundcover. Once the groundcover has responded and can successfully carry fire, staff will facilitate planting of longleaf pine to continue the restoration process.

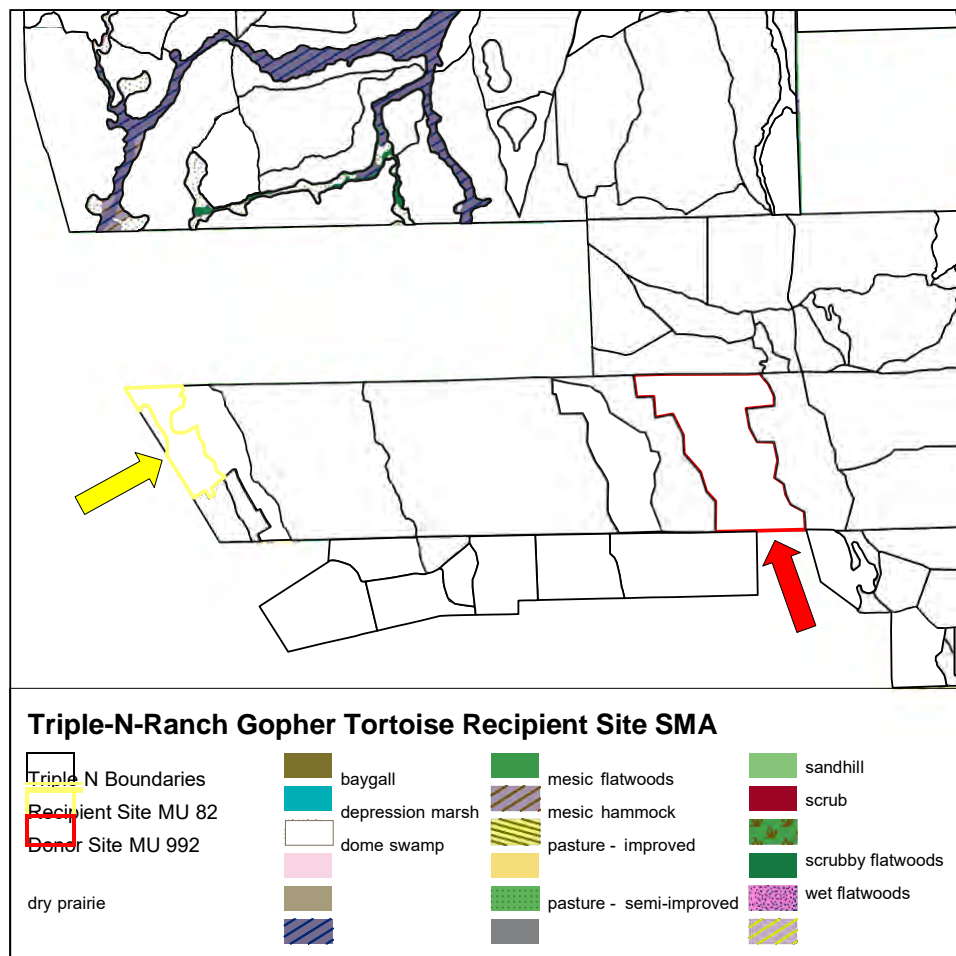
Recreational activities occurring on TNRWMA include hiking, horseback riding, bird watching, and hunting. Hunts on TNRWMA include a special opportunity deer season, a special opportunity spring turkey season, a regular quota wild hog season, and a small game season. A campsite is located at the check station and camping is allowed only during the various hunting seasons. Unlike HH/BCWMA, roads on TNRWMA do not remain open year round. Vehicular access is limited to named and numbered roads, which are only open during the various hunting seasons.

Current wildlife monitoring by FWC on TNRWMA includes annual spotlight surveys for white-tailed deer, an ongoing population study of red-cockaded woodpeckers, and fall covey counts for Northern bobwhites. White-tailed deer populations remain stable and continue to provide good hunting opportunities, with a 5-year average density of 14 deer/square mile. Because TNRWMA is adjacent to HH/HH/BCWMA, the RCWs found on both properties are treated as one population. A total of 8 active clusters and 17 individual RCWs occur on the combined areas. According to the WMA's management plan for RCWs, the area (including both TNRWMA and HH/HH/BCWMA) can support up to 47 potential breeding groups. [Section 3.2.15](#) contains detailed information on the status of red-cockaded woodpeckers on HH/BCWMA and TNRWMA. In 2007, staff initiated fall covey counts on TNRWMA to evaluate and track through time the number of bobwhite prior to the hunting season. Results from these surveys have varied from a high of 1 bird/2.5 acres in 2007 to a low of 1 bird/3.9 acres in 2008.

The Hunting and Game Management Division (HGM; [Section 6.1.2](#)) selected TNRWMA for development of a shooting range. Rather than alter any natural communities for the range, HGM selected 83-acres of the 'East Grove' improved pasture tract in Management Unit (MU) 992. During a pre-construction assessment in March 2015, surveyors observed 51 potentially occupied gopher tortoise (*Gopherus polyphemus*) burrows in the proposed shooting range construction project site. In order to abide by agency policy for regulating gopher tortoises, FWC was issued a Conservation permit to relocate the tortoises within TNRWMA to an area undergoing ground-cover restoration (GCR). The 40- acre relocation site, located adjacent to US 441 in the 'Office North' GCR tract of MU 82 ([Figure 1](#)), was selected to be the recipient site for the tortoises, and FWC was required to comply with the [FWC Gopher Tortoise Permitting Guidelines](#). Contractors from Ecological Consulting Solutions, Inc. constructed the temporary enclosure around the site, and assessed the area for habitat composition and tortoise density prior to the relocation. In April 2015, these consultants moved 14 adult tortoises from the shooting range site to the recipient site, where the gopher tortoises will be monitored and managed. More details regarding this management are in the gopher tortoise assessment ([Section 3.2.4](#)).

The current staff level for HHBCWMA and TNRWMA includes one Biological Scientist III, two Biological Scientist IIs, and two Wildlife Technicians.

Figure 1. Management units and natural communities associated with gopher tortoise relocation on TNRWMA. Consultants moved 14 adult tortoises to a 40-acre recipient site in MU 82 to accommodate the construction of a shooting range on MU 992.



Section 3: Area Focal Species

FWC's land management focuses on restoring the natural form and function of natural communities. However, in some instances, it is important to consider the needs of specific species and to monitor the influences of natural community management on select wildlife. To achieve a focused, science-informed approach to species management, FWC uses the focal species concept embraced by the [Wildlife Habitat Conservation Needs in Florida](#) project. This concept, if applied correctly, allows one to identify the needs of wildlife collectively by strategically focusing on a subset of wildlife species. The subset of species selected as focal species includes umbrella species, keystone species, habitat specialist species, and indicator species.

The Public Lands Conservation Planning (PLCP) project selected 60 focal species for the statewide assessment. The PLCP project used potential habitat models to create statewide potential habitat maps for each species. Models were created using relevant available data with the base layer for all models being the FWC's 2003 landcover data.

Considering the natural history of species, staff selected additional data layers such as the species' range, soils used, land use, etc. As such, each model is species specific. Once statewide potential habitat maps were available, a PVA was conducted for each focal species. The statewide landcover-based habitat models identified the same 22 of the 60 focal species to have potential habitat on both WMAs ([Section 3.1](#)). One additional species, the eastern indigo snake (*Drymarchon couperi*), was added because of its conservation importance. Staff created more accurate area-specific potential habitat maps by using the same statewide model for each focal species on the area but replacing the landcover data with area-specific natural community data. The resulting potential habitat map was then refined based on the input of local managers and species experts. All potential habitat acreage estimates provided in [Section 3.2](#) are the results of this area-specific model and resulting map.

The HH/BCWMA and TNRWMA WCPR Workshop on January 25-26, 2012 brought decision makers together to assess species' opportunities and needs, determine required actions including monitoring, identify measurable objectives, and identify necessary coordination efforts. WCPR staff compiled information on the focal species in a workbook to facilitate informed discussion of the 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 long-term security of the species (i.e., examining PVA results), if the species occurs in actively managed communities ([Table 1](#) and [Table 2](#)), if the species is management responsive, and any other local overriding considerations (e.g., status of species in the region, local declines/extirpations). A brief summary of the opportunity and need assessment for each focal species is available in [Section 3.2](#).

3.1: Focal Species

Workshop participants assessed the following 23 species for their level of opportunity or need on both properties. Species that have a measurable objective are indicated with a ¹, and species for which monitoring is recommended are indicated with a ², and species for which a SMA is recommended are identified with a ³. Occasionally, statewide models indicated a species had potential habitat on the area, but the local assessment indicated there is little opportunity to manage for these species on the area and they should not be a focus of management on the area. These species are identified with an *.

Gopher frog (*Lithobates [Rana] capito*) ^{1,2}

Eastern indigo snake (*Drymarchon couperi*)

Florida pine snake (*Pituophis melanoleucus mugitus*) Gopher
tortoise (*Gopherus polyphemus*) ^{1,2,3}

American swallow-tailed kite (*Elanoides forficatus*) Bachman's
sparrow (*Peucaea [Aimophila] aestivalis*) ^{1,2} Brown-headed
nuthatch (*Sitta pusilla*) ^{1,2}

Burrowing owl (*Athene cunicularia floridana*)

Cooper's hawk (*Accipiter cooperii*)

Crested caracara (*Caracara cheriway*)
 Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) *
 Florida mottled duck (*Anas fulvigula*)
 Florida sandhill crane (*Grus canadensis pratensis*)
 Limpkin (*Aramus guarauna*)³
 Northern bobwhite (*Colinus virginianus*)^{1, 2}
 Red-cockaded woodpecker (*Picoides borealis*)^{1, 2, 3}
 Short-tailed hawk (*Buteo brachyurus*)
 Snail kite (*Rostrhamus sociabilis plumbeus*) * Southern
 bald eagle (*Haliaeetus leucocephalus*) Wading birds
 (Multiple spp.)³

Florida black bear (*Ursus americanus floridanus*) Florida
 panther (*Puma concolor coryi*) Sherman's fox squirrel
 (*Sciurus niger shermani*)

3.2: Focal Species Opportunity and Needs Assessment

This section provides an assessment of the opportunity for management and needs of each of the focal species. Because all federally listed species 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 management plans for FWC-listed species. Staff will monitor these plans to determine if the content of the plans warrants a revision to any of these assessments. Revisions will be amended to the strategy.

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 these WMAs play 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 WMAs. We presume that by doing the actions called for in this strategy, we will ensure both areas fulfill their role in the conservation of wildlife.

3.2.1: Gopher Frog

Gopher frogs occur on both HH/BCWMA and TNRWMA with staff occasionally hearing their vocalizations when in the field. Staff is working with FWC herpetologists to document the overall distribution of gopher frogs and to identify specific breeding ponds on either WMA. Surveys completed in spring 2012 identified a single breeding pond, but it is possible others exist. In Florida, gopher frog habitat is a subset of gopher tortoise habitat that contains fishless ephemeral wetlands in which gopher frogs breed. After breeding, gopher frogs move back into surrounding upland habitat within a mile of the breeding pond. They prefer native, fire-maintained xeric habitats with intact groundcover, but can persist in areas with some habitat alteration. Gopher frogs often occupy gopher tortoise burrows, but they

will use rodent and crayfish burrows, stump holes, and hollow logs.

Gopher frogs in Florida are an FWC-listed species of special concern. Considered a moderate priority statewide, this species triggers 2 of 6 prioritization parameters ([priorities table](#)). On HH/BCWMA, models identified 17,023 acres of gopher frog potential habitat with 17,795 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 11,368 acres of gopher frog potential habitat. While little is known about specific habitat requirements or home range size, experts presume that both areas have enough potential habitat to support viable gopher frog populations providing more breeding ponds exist.

Management actions that benefit gopher frogs include the continued use of frequent prescribed fire in mesic flatwoods, scrubby flatwoods, dry prairie, scrub, and isolated wetlands occurring within this matrix of uplands. On both WMAs, the continued use of prescribed fire in these natural communities will provide benefit to this species. Additional land management recommendations for gopher frogs can be found in [Section 4.3.1](#). Because ongoing efforts to maintain or enhance the natural community structure and function on both areas will be sufficient to meet this species' needs, no SMA is required. There are no specific species management actions for gopher frogs at this time.

Monitoring would be useful for tracking gopher frog use of breeding ponds over time on both areas. Information on the location and abundance of this species should be shared with FWRI ([Section 6.1.3](#)). However, it may be necessary to identify additional resources to complete this monitoring. Gopher frog call-counts or dipnetting of breeding ponds could be conducted with assistance from FWC herpetologists and committed volunteers if they can be identified ([Section 5.2.1](#)). Additionally, the monitoring protocol for gopher frogs requires very specific weather conditions that can complicate implementation. If baseline monitoring is not possible given current staff resources, opportunistic documentation of gopher frogs or breeding ponds is recommended.

The goal for both areas is to support a viable population of gopher frogs. Staff will accomplish this goal by protecting known breeding ponds and continuing to apply frequent prescribe fire in gopher frog habitat. Assuming monitoring is a reasonable action, the measurable objective is to:

1. Conduct a baseline survey to determine the general spatial distribution of breeding ponds on both areas by 2015.
2. Repeat these surveys on an approximate 5-year interval to track use of breeding ponds (depending on suitable weather conditions).

3.2.2: Eastern Indigo Snake

Eastern indigo snakes are rarely observed on either WMA. Generally associated with sandhill, scrub, and scrubby flatwoods, indigo snakes also use pine flatwoods, dry prairies, hardwood hammocks, marsh edges, and agricultural fields. Gopher tortoise burrows are important refuge sites for indigo snakes and provide protection from cold and desiccation.

Indigo snakes also will use cotton rat burrows, hollowed tree stumps, ground litter, trash piles, and rock piles for refuge.

The indigo snake was added to the focal species list for these WMAs because it is a federally-listed species and triggers 3 of 4 available prioritization parameters ([priorities table](#)). On HH/BCWMA, models identified 18,172 acres of potential habitat with 18,760

acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 11,634 acres of potential habitat. The body of research for indigo snakes suggests that at least 4,000 acres of habitat are required to support a viable population. Given this, each WMA has enough potential habitat to support a viable population. In reality, indigo snakes occurring on either WMA likely function as a single population that also uses adjacent private lands.

Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical treatments that aid in restoring natural community structure and function. Stumps and other coarse woody debris should be retained during land management activities as potential refuge sites ([Section 4.3.2](#)).

Because there is no adequate monitoring technique available for this species, no measurable objectives have been identified. However, opportunistic monitoring is recommended ([Section 5.2.6](#)) and the results should be shared with FWRI ([Section 6.1.3](#)). Although drift-fence surveys will not provide population level information on this species, future drift-fence surveys conducted on the area should include the use of large upland snake traps to ensure adequate detection of large snakes such as the indigo or pine snake.

The goal for both WMAs is to support indigo snakes on these WMAs. This will be accomplished by continuing to apply frequent prescribed fire in upland communities that could be used by indigo snakes. Although these areas can accommodate the needs of this species, the continued presence of this species on these WMAs is supported by conditions on private lands that influence the regional population. Accordingly, some coordination with FWC's Conservation Planning Services (CPS; [Section 6.1.5](#)) is recommended to ensure adjacent private landowners are aware of the habitat needs and conservation of indigo snakes.

3.2.3: Florida Pine Snake

There is no documentation of Florida pine snakes occurring on HH/BCWMA or TNRWMA. In 2012, pine snakes were documented on TLWMA, south of HH/BCWMA and TNRWMA.

Although pine snakes use a number of plant communities, they typically occupy areas with sandy soils, a well-developed grassy understory, and sparse pine canopy, such as upland pine and sandhill communities. Pine snakes actively seek out and burrow into pocket gopher mounds to capture pocket gophers, which are a major source of food for this species. The absence of pocket gophers, however, does not directly correlate to an absence of pine snakes.

The Florida pine snake triggers 3 of 6 prioritization parameters ([priorities table](#)) and is an FWC-listed species of special concern. On HH/BCWMA, models identified 11,240 acres of potential habitat with 11,530 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 9,343 acres of potential habitat.

According to the literature, pine snakes and indigo snakes have similar home range sizes, and >2,471 acres of suitable habitat are required to support a viable population of pine snakes. The majority of potential habitat for pine snakes on both WMAs occurs in mesic flatwoods with dry soils, which does not reflect optimal habitat. However, the interspersed of more xeric communities like scrub, sandhill, and scrubby flatwoods around these mesic sites can support snakes during flooding events. Given this arrangement of potential habitat on both WMAs, the large size of these WMAs, the physical connection to each other, and the good to excellent condition of their natural communities, there is a good opportunity for management

to support pine snakes if they occur.

Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical treatments that promote appropriate groundcover. Stumps and other coarse woody debris should be retained during land management activities as potential refuge sites ([Section 4.3.2](#)). Efforts to restore and maintain natural community structure and function on both WMAs will benefit pine snakes; therefore, no SMA is recommended. Because there is no adequate monitoring technique available for this species, no measurable objectives have been identified. However, opportunistic monitoring is recommended ([Section 5.2.6](#)). Although drift-fence surveys will not provide population level information on pine snakes, any future drift-fence surveys conducted on these areas should include the use of large upland snake traps to ensure adequate detection of large snakes.

The goal for both WMAs is to support pine snakes on these WMAs. This will be accomplished by continuing to apply frequent prescribed fire in upland communities that could be used by pine snakes. Although these areas can accommodate the needs of this species, the continued presence of pine snakes on these WMAs is supported by conditions on adjacent private lands that influence the regional population. Accordingly, some coordination with FWC's Conservation Planning Services (CPS; [Section 6.1.5](#)) is recommended to ensure adjacent private landowners are aware of the habitat needs and conservation of pine snakes.

3.2.4: Gopher Tortoise

Gopher tortoises are common on both HH/BCWMA and TNRWMA. On HH/BCWMA, tortoise burrows generally occur in low densities throughout mesic flatwoods with drier soils. Pockets of scrub and scrubby flatwoods appear to have a higher density of burrows than flatwoods, but no assessment on the status or distribution of tortoises has been completed on HH/BCWMA. On TNRWMA, tortoise burrows are common in pockets of scrubby flatwoods and occur occasionally in mesic flatwoods.

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 maintained with fire that helps perpetuate the groundcover on which it feeds.

Ecologists consider the gopher tortoise a keystone species because many other species, including focal species such as the Florida mouse and gopher frog, use tortoise burrows. This FWC-listed threatened species triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high priority species statewide. The FWC approved a gopher tortoise management plan in 2007 that placed emphasis on increasing the number of tortoises on public lands. The FWC is in the process of revising this plan with the revision scheduled for completion in September 2012, and the revised plan retains the emphasis on habitat restoration on public lands.

On HH/BCWMA, models identified 11,583 acres of potential habitat with 11,884 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 9,694 acres of potential habitat. Although there is considerable discussion in the literature about the amount of habitat required to maintain a viable population, both areas have more potential habitat than even the most conservative estimates, and therefore are capable of supporting a viable population.

There is a high level of opportunity on both HH/BCWMA and TNRWMA to maintain habitat suitable for gopher tortoises and maintain good tortoise densities. Further, the maintenance of suitable habitat for gopher tortoises will benefit a number of other wildlife species. Much of the potential habitat within mesic flatwoods on both WMAs is presently in good to excellent condition and is subject to frequent prescribed fire. Ongoing efforts to maintain natural community structure and function in these flatwoods with prescribed fire will continue to benefit the gopher tortoise. Scrub and scrubby flatwoods on HH/BCWMA presently are in fair condition for tortoises; mechanical vegetation treatments, where required, in advance of prescribed fire would help reduce shrub heights, promote open ground, and improve herbaceous cover. These actions would provide direct habitat benefits for gopher tortoises. Additional land management recommendations are found in [Section 4.3.3](#).

In April 2015, consultants began construction on a FWC-approved shooting range in MU 992 (see [Section 2.3](#)). During a pre-construction survey of MU 992, consultants found that the ruderal agricultural field contained a low-density of gopher tortoises (51 potentially occupied burrows over 82 acres of habitat) that would need to be moved from the footprint of the shooting range. To accommodate this relocation, area staff and HGM identified a 40-acre block of habitat on MU 82 that had been undergoing ground cover restoration (GCR), and contained no resident gopher tortoises ([Figure 1](#)). At the time of construction, the herbaceous groundcover on MU 82 was in good condition to support gopher tortoises, and species experts believed the habitat would benefit from tortoise restocking.

In spring 2015, consultants built a temporary enclosure around the area in MU 82 to accommodate the release of 14 tortoises from the donor area in MU 992. Prior to the relocation, consultants monitored the habitat conditions and tortoise population as required by the [FWC Gopher Tortoise Permitting Guidelines](#) for relocating gopher tortoises (Appendix 12). To accommodate the other special management and monitoring considerations required by the relocation permit, this area was identified as the Gopher Tortoise Recipient Site SMA ([Section 4.1.3](#)). The identification of this SMA ensures that future management will enhance and maintain suitable habitat conditions for the relocated gopher tortoises, and benefit the overall tortoise population on TNRWMA. Staff should manage and monitor the area as detailed in the SMA section throughout the lifetime of the Strategy ([Section 4.1.3](#)).

As a management-responsive species, density and abundance of tortoises can be indicators that land management activities are having a positive influence. Due to the size of these WMAs, monitoring this species will be time consuming and expensive. However, the completion of a baseline tortoise survey on both areas would be beneficial in providing additional guidance on the effect of management practices ([Section 5.2.2](#)). Current resource levels make accomplishing this effort difficult, and additional resources are required to accomplish the baseline survey. Funds requested through the annual enhancement list would support conducting the baseline, and any subsequent, monitoring for tortoises.

The goal for both areas is to maintain a viable population of gopher tortoises. This will be achieved by maintaining habitat in a suitable condition. If resources are obtained, the measurable objectives are:

1. Complete a baseline assessment (including burrow scoping if possible) of gopher tortoise burrow distribution and density on both WMAs by 2016.
2. Repeat these assessments on a 5-10 year interval, pending resource availability.

3.2.5: American Swallow-Tailed Kite

Swallow-tailed kites are occasionally seen on both HH/BCWMA and TNRWMA. Staff has not documented nesting on either property, but do report seeing groups of swallow-tailed kites foraging or loafing over the areas during the breeding season. The Avian Research and Conservation Institute (ARCI), a research organization that conducts statewide research on swallow-tailed kite and short-tailed hawk populations, suggests that there is some potential for nesting to occur on both WMAs. ARCI also indicates the areas may be important for providing foraging habitat to swallow-tailed kites that are moving through the landscape. Regionally, one of the largest pre-migratory roosts for swallow-tailed kites in Florida occurs on Lake Hellen Blazes, located approximately 6 miles from HH/BCWMA. ARCI estimates 1,000–2,000 individuals use this lake from late June to early August in advance of their migratory flight south. As stated in the Osceola Pine Savannas Florida Forever project proposal, one of the purposes for acquisition of lands in the project area, including TNRWMA, was to ensure the persistence of prairie wildlife species such as the swallow-tailed kite. As such, management on TNRWMA needs to be compatible with swallow-tailed kite conservation needs.

Swallow-tailed kites are habitat generalists and utilize a variety of natural communities on both WMAs. Open areas are used for foraging, and trees that are dominant or taller than surrounding trees are preferred as nest trees. Shrub height and density tends to be higher around nest sites. Because this species has high nest site fidelity, maintaining suitability of nesting areas is important. Riparian areas and cypress strands along Bull Creek provide the best potential nesting habitat due to their large, continuous acreage.

American swallow-tailed kites trigger 4 of 6 statewide prioritization parameters ([priorities table](#)), making them a moderate statewide priority. On HH/BCWMA, models identified 15,649 acres of potential habitat with 16,303 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 12,584 acres of potential habitat.

American swallow-tailed kites are not typically considered management-dependent and the opportunity to affect this species at the management area level on HH/BCWMA and TNRWMA is low. However, ongoing efforts to maintain natural community structure and function will benefit swallow-tailed kites. Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical actions that aid in restoring natural community structure, as this maintains foraging habitat. FWC's management that protects riparian areas and cypress strands will ensure the existence of potential nesting sites. If staff observes swallow-tailed kite nesting activity, this information should be documented and reported ([Section 5.2.6](#)). If nests are located on the area, protective measures around these sites will be applied ([Section 4.3.4](#)), and the nest will be reported to ARCI ([Section 6.4](#)). Because this species has low management opportunity, it is not a good species to monitor to verify the effect of management, and area-specific objectives for this species are not needed. Cooperation with ARCI for future monitoring efforts is encouraged to further define the regional needs of the species and the role of both WMAs. There is no need to establish a SMA as there is no specific management that could be applied specifically for the benefit of this species.

The area goal is to promote suitable foraging and nesting habitat for the American swallow-tailed kite that will allow kites using these WMAs to function as part of a regional population. While the continued presence of American swallow-tailed kites is dependent on conditions affecting the regional population, the amount of potential habitat on these WMAs and the adjacent conservation areas increases the likelihood that swallow-tailed kites will continue to persist and utilize these WMAs.

3.2.6: *Bachman's Sparrow*

Bachman's sparrows are common throughout both WMAs. Staff reports this species as being widespread throughout frequently burned mesic flatwoods and dry prairie on both WMAs. Nesting has not been documented but it is believed to be occurring. No specific monitoring to determine the spatial distribution or relative abundance of Bachman's sparrows has been completed on either WMA. Bachman's sparrows prefer mature open pine forests, dry prairies, or old-field communities with a healthy herbaceous groundcover maintained with frequent prescribed fire. Research suggests Bachman's sparrows prefer fire return intervals of 18-24 months. Current management on HH/BCWMA and TNRWMA provides suitable habitat for this species.

The Bachman's sparrow triggers 2 of 6 prioritization parameters ([priorities table](#)) and is currently experiencing range-wide population declines. Regionally, Bachman's sparrows have been documented on nearby conservation areas and are common on TLWMA. On HH/BCWMA, models identified 12,337 acres of potential habitat with 12,851 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 8,467 acres of potential habitat. Literature suggests a viable population can be maintained on around 520 acres, which suggests both areas have enough potential habitat to support a local population of Bachman's sparrows.

Management actions that benefit this species include the frequent application of prescribed fire, which is already occurring throughout the majority of mesic flatwoods and dry prairie on both properties. Continuing efforts to apply prescribed fire on both WMAs provide the opportunity for maintaining habitat suitability for Bachman's sparrows; therefore, no SMA is required. Additional land management recommendations for Bachman's sparrow can be found in [Section 4.3.5](#).

Staff does not monitor Bachman's sparrows on either HH/BCMWA or TNRWMA, largely due to limitations in resources. Because Bachman's sparrows are management responsive, some level of monitoring ([Section 5.2.3](#)) is recommended as a means to track the continued affect of prescribed fire and other management actions on the area's wildlife species. Because this species is common and responds well to current management practices, monitoring can occur infrequently (e.g., every 3 years) to verify their continued presence.

Any decline in Bachman's sparrows on either WMA should result in additional monitoring to determine the cause. Volunteers may be an effective mechanism to complete monitoring activities for Bachman's sparrows. Monitoring for Bachman's sparrows can be accomplished simultaneously with monitoring for brown-headed nuthatches.

The goal for both areas is to continue to support viable Bachman's sparrow populations. Measurable objectives are:

1. Conduct a baseline survey on both WMAs by 2015.
2. Repeat avian monitoring surveys on a 3-year interval.

3.2.7: Brown-Headed Nuthatch

Brown-headed nuthatches are common throughout the mesic flatwoods of both HH/BCWMA and TNRWMA. While breeding has not been documented, it is suspected to be occurring on both properties. This species is dependent on open stands of mature pine. Older pine forests (>35 years for longleaf-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. This cavity-nesting species is dependent on the presence of snags for suitable nesting habitat. This species triggers 2 of 6 prioritization parameters ([priorities table](#)) and is currently experiencing range-wide declines due to habitat loss and degradation. Regionally, nuthatches have been documented on nearby conservation areas and are common on TLWMA. On HH/BCWMA, models identified 13,877 acres of potential habitat with 14,282 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 8,312 acres of potential habitat. Literature suggests 1,000 acres of habitat is necessary to support a viable population, therefore, both WMAs could support a viable population.

Management actions that benefit this species include frequent application of prescribed fire, which is ongoing throughout the majority of mesic flatwoods on both properties. The average basal area for TNRWMA is around 15 ft²/ acre, which may somewhat reduce the area's suitability for nuthatches. However, basal areas on TNRWMA will increase with time and should enhance the area's role for nuthatches. Ongoing efforts to maintain natural community structure and function on both WMAs have a high opportunity to maintain or improve the current habitat suitability for nuthatches. Because current management practices aimed at maintaining natural community structure and function are sufficient, no SMA is required. Efforts to protect and allow for the creation of snags during land management activities will further improve habitat suitability ([Section 4.3.6](#)).

Staff does not monitor brown-headed nuthatches on either HH/BCMWA or TNRWMA, largely due to limitations in resources. As with Bachman's sparrows, some level of monitoring ([Section 5.2.4](#)) for nuthatches is recommended as one way to track the continued affect of prescribed fire and other management actions on this snag-dependent species. Because this species is common and responds well to current management practices, monitoring can occur infrequently (e.g., every 3 years) to verify their continued presence.

Any decline in nuthatches on either WMA should result in additional monitoring to determine the cause.

The goal for both areas is to continue to support viable brown-headed nuthatch populations. Measurable objectives are:

1. Conduct a baseline survey on both WMAs by 2015.
2. Repeat avian monitoring surveys on a 3-year interval.

3.2.8: Burrowing Owl

There is no documentation of burrowing owls occurring on either HH/BCMWA or TNRWMA. Burrowing owls require open, treeless areas with low groundcover and sandy soils in which they excavate burrows. Historically, burrowing owls predominately utilized

dry prairie habitat. Currently, most burrowing owl populations utilize non-native habitats and are frequently found on altered landscape features, such as pasture and berms or canal banks. This species uses underground burrows extensively, particularly during the spring for nesting and in the winter for protection from predators. Optimal habitat for this species includes soils that remain dry during times of peak burrow use. Much of the current burrowing owl habitat occurs on private land and in urban areas in danger of development.

Therefore, even small populations occurring on public land are significant.

The burrowing owl is a species of special concern in Florida and triggers 4 of the 6 prioritization parameters ([priorities table](#)). The literature suggests areas that can support at least 30 pair have potential to persist. This species is loosely colonial with reported densities of 0.44 pairs per acre (0.18 pairs/ha). On HH/BCWMA, models identified 879 acres of potential habitat with 530 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 1,238 acres of potential habitat. Occurrence records indicate burrowing owls have been documented on TLWMA as well as private lands south of TLWMA. There is a record of burrowing owls from River Lakes Conservation Area, which is located northeast of HH/BCWMA.

Dry prairie, which occurs as small, isolated patches scattered across the properties, accounts for 1,007 acres (528 on HH/BCWMA, 479 on TNRWMA) of the modeled potential habitat. A large spoil berm on HH/BCWMA's eastern boundary and a 500-acre block of improved pasture on TNRWMA represents the majority of the remaining potential habitat.

Using density estimates reported for burrowing owls (0.44 pairs/acre), the WMAs together could potentially support 443 pairs on dry prairie communities alone. With the addition of potential habitat in pastures and ruderal sites, there is enough acreage, in theory, to support a viable population on these WMAs. Dispersal estimates for burrowing owls suggest it is reasonable to assume all patches of potential habitat on both WMAs would function to support a single, viable population. However, no burrowing owls have been documented on either WMA and the status of owls on private lands around these WMAs is unknown. Given these factors, these WMAs currently play a minimal role in the conservation of this species. However, because pasture is included in the burrowing owl potential habitat model and there is a large amount of ranchland in this part of Florida, the habitat model indicates considerable acres of potential habitat on private lands around HH/BCWMA and TNRWMA. FWC's Conservation Planning Services staff ([Section 6.1.5](#)), which works with private landowners, indicates that burrowing owls likely occupy some private lands near these conservation lands. While these WMAs currently play a minimal role in the conservation of this species, if burrowing owls do disperse onto these WMAs, there would be a high opportunity for management activities to support their persistence.

The continued use of frequent prescribed fire in dry prairie communities is compatible with the needs of this species and will maintain the treeless canopy and low stature groundcover this species prefers. [Section 4.3.7](#) contains additional land management recommendations for this species. Translocation is not currently a viable option for this species and staff believes that if the habitat is suitable, burrowing owls will naturally colonize this property.

Opportunistic documentation of burrowing owls is recommended ([Section 5.2.6](#)).

The goal for both WMAs is to continue to maintain habitat in a condition that allows for the potential occupancy by burrowing owls. There are no measurable objectives at this time; however, this should be re-evaluated in future Strategies should burrowing owls be

detected.

3.2.9: *Cooper's Hawk*

The Cooper's hawk is common on HH/BCWMA and TNRWMA. Commonly associated with woodlands, this species will nest in a variety of habitats including swamps, floodplain and bottomland forests, sand pine scrub, and baygalls. Nest trees are usually located close to an edge in dense stands of oaks or pine, and nests usually are placed near the crown of a tree. Cooper's hawks primarily feed on other birds, so nests are located in proximity to suitable hunting areas. While nesting has not been documented, staff believes nesting is occurring on both properties.

The Cooper's hawk triggers 1 of 6 prioritization parameters ([priorities table](#)). On HH/BCWMA, models identified 18,817 acres of potential habitat with 16,249 acres modeled to occur if management could restore all natural communities. This apparent reduction in acreage with restoration is an artifact of the modeling process that over-emphasizes the need for a mosaic of different natural communities. As such, much of the area historically served as, and will continue to serve as, potential habitat. On TNRWMA, models identified 10,257 acres of potential habitat.

Cooper's hawks are not typically considered management-dependent and the opportunity to influence this species at the management-area level is low. However, ongoing efforts to apply prescribed fire and mechanical treatments designed to maintain natural community structure and function will benefit the Cooper's hawk by enhancing prey abundance while providing adequate nest sites.

Because the opportunity to manage the Cooper's hawk is low, local monitoring is not recommended. Species-specific objectives or a SMA would be inappropriate given that there is no management to apply specifically for the Cooper's hawk. 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 (carrying nesting material to/from an area, acting aggressively), the location will be noted ([Section 5.2.6](#)) and the area will be protected from disturbance if feasible ([Section 4.3.8](#)).

The area goal is to provide suitable foraging and nesting habitat that will allow Cooper's hawks using HH/BCWMA and TNRWMA to function as part of a regional population. While the continued presence of the Cooper's hawk on these WMAs is dependent on conditions that influence the regional population, the recent population increases experienced by this species and the amount of potential habitat on the WMAs and in the surrounding landscape greatly increase the chance of persistence of this species.

3.2.10: *Crested Caracara*

Crested caracaras are occasionally seen on both HH/BCWMA and TNRWMA; nesting has not been documented, but managers feel there is potential for it to occur on-site. Regionally, caracaras have bred on the Whaley Conservation Easement and TLWMA, south of TNRWMA. Caracaras prefer to forage in open areas with low ground and shrub cover, conditions that are maintained with fire, grazing, or mechanical treatments. Caracaras typically build their nests in a cabbage palm (*Sabal palmetto*) in an open area with scattered

trees. Caracaras have high nest site fidelity; therefore, protection of known nest sites is important.

The crested caracara is federally listed as threatened and triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high statewide priority. A majority of the crested caracara population in Florida occurs on private lands where they take advantage of the open condition created for ranching. However, this dependence on private lands contributes to the threats of habitat loss and degradation. On HH/BCWMA, models identified 12,537 acres of potential habitat with 12,865 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 10,577 acres of potential habitat.

Given that caracaras have relatively large home range sizes (average of 3,000 acres), these two WMAs could be important to the regional caracara population as they could potentially support up to 7 breeding pairs. Additionally, the proximity to private ranchlands and other conservation lands with potential habitat increases the likelihood that there is a regional population of caracaras utilizing both the public and private lands.

Ongoing efforts to restore and maintain the WMAs' plant community structure and function through prescribed fire, and roller chopping where palmetto coverage is too high, will benefit caracaras. Because these actions are sufficient, there is no SMA required for this species. The presence of pre-dispersal young with adults will be recorded. If there is reason to believe nesting is occurring, an attempt will be made to document the nest ([Section 5.2.6](#)). When nests are detected, staff will implement protective measures ([Section 4.3.9](#)). Since much of the state's caracara population utilizes private lands, coordination with private landowners through FWC's CPS staff will be necessary to ensure persistence on and around HH/BCWMA and TNRWMA ([Section 6.1.4](#)).

The areas' goal is to maintain appropriate natural communities in a condition suitable to ensure the crested caracaras occurring on both WMAs function as a part of the regional population. There are no measurable objectives recommended. While these properties have a role in supporting the regional caracara population, ultimately, the continued existence of this species on these WMAs is dependent on conditions that influence the regional population. However, the amount of potential habitat on the conservation lands in this part of Florida, including these WMAs, in combination with the current use of nearby private lands, greatly enhance the chance of persistence.

3.2.11: Florida Mottled Duck

Mottled ducks are rarely observed on either WMA. Regionally, mottled ducks occupy the TM Goodwin Waterfowl Management Area, located approximately 10 miles southeast of HH/BCWMA. Additionally, the Florida Breeding Bird Atlas has confirmed breeding by mottled ducks in Osceola County. Natural communities on both WMAs are likely to support individual ducks foraging through the landscape and may provide nesting opportunities. Nesting females tend to locate their nests on the ground in dense vegetation clumps (tall grasses, rushes, or palmetto thickets) occurring in otherwise open area near water. Mottled ducks nest in dry marshes, pine flatwoods, citrus groves, and urban areas. Habitats these ducks avoid include wet prairies, shrub and forested wetlands, open water, and deeply flooded areas. This species prefers shallow water less than 10 inches deep and wetlands with emergent vegetation. Management activities that promote a mosaic of open water and cover within shallow emergent wetlands can enhance foraging habitat. In uplands

adjacent to appropriate wetlands, management practices that maintain a generally open condition with some interspersions of cover such as thick patches of grass or palmetto will enhance nesting opportunities.

The mottled duck is not listed by either the FWC or the United States Fish and Wildlife Service (USFWS), and triggers 2 of the 6 statewide prioritization parameters ([priorities table](#)). Being a Florida endemic and a popular game species, the Florida mottled duck is a medium priority statewide. On HH/BCWMA, models identified 2,135 acres of potential habitat with 2,348 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 2,267 acres of potential habitat. Both WMAs have ephemeral wetland communities embedded within the larger upland communities. These types of wetlands may be suitable as foraging habitat when inundated, but are not used during dry periods. On these WMAs, the dry season often coincides with the mottled duck nesting season.

While basin marshes and depression marshes are not actively managed natural communities, prescribed fire is allowed to burn into and across wetlands, which helps reduce hardwood encroachment. This will benefit mottled ducks using these marshes for foraging. Staff's use of frequent, low-intensity prescribed fires in the adjacent uplands is compatible with the nesting habitat needs of mottled ducks.

Because the existing use of prescribed fire in uplands and wetlands will create and maintain any potential mottled duck habitat, no SMA is recommended. FWC's Waterfowl program monitors this species at the State level, so local monitoring is not necessary.

However, opportunistic observations of nesting activity and juveniles will be recorded ([Section 5.2.6](#)).

The goal for both WMAs is to enhance and maintain a mosaic of suitable wetland and upland habitats that will allow mottled ducks using these WMAs to function as part of a regional population. While the continued existence of this species on these WMAs is dependent on conditions that influence the regional population, the proximity of the WMAs to important mottled duck habitat on existing conservation lands increases the chance of long-term persistence.

3.2.12: Florida Sandhill Crane

The Florida sandhill crane is common on HH/BCWMA and TNRWMA. Staff has documented nesting on TNRWMA, and has seen juveniles on both properties. This species uses a combination of shallow wetlands and open upland habitats with a majority of the vegetative cover ≤ 20 inches in height. Standing water is an important component of nesting habitat for Florida sandhill cranes. Nests consist of herbaceous plant material mounded in shallow water or marshy areas. Home range size varies seasonally and regionally, with adult pairs requiring approximately 300-600 acres per pair. Habitat used includes a mosaic of emergent palustrine wetlands and open uplands such as pasture, prairie, and open pinelands. Historically, fire maintained the open condition in these habitats; but managers can use fire, cattle grazing, and mechanical actions to create and maintain acceptable conditions.

The Florida sandhill crane is a FWC-listed threatened species that triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a moderate to high statewide priority. Concern for ongoing loss of habitat on private lands makes conservation of this species on State lands more of a priority. Sandhill cranes will occupy the same territory for many years,

and typically move only when necessitated by environmental conditions (e.g. drought) or deteriorating habitat.

On HH/BCWMA, models identified 15,963 acres of potential habitat with 16,624 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 11,848 acres of potential habitat. Species experts indicate that areas with at least 1,200 acres of suitable crane habitat can support 6 pairs, and 6 pairs can persist at least in the short term. Therefore, these WMAs may have an important role in maintaining this species, particularly in combination with other conservation and private lands located nearby. While there are limited occurrence records around these WMAs, private and public lands in this part of Florida are known to be frequently used by cranes.

Given this, both WMAs have good potential to support the regional stability of this species. Management actions that will benefit sandhill cranes include prescribed fire and mechanical treatments that maintain upland habitat in the open condition cranes prefer. Protection of nesting habitat is also essential. Because current management actions on HH/BCWMA and TNRWMA support the habitat needs of sandhill cranes, it is not necessary to designate an SMA. Staff may find sandhill crane nests while conducting ongoing management actions and actions taken for other species. When this occurs, nest locations will be documented. This level of monitoring is not sufficient to be considered a full count, and will therefore be opportunistic ([Section 5.2.6](#)). Staff will share observations of nesting activity with appropriate entities ([Section 6.5](#)). When nests are detected, management activities will be planned to avoid disturbance ([Section 4.3.10](#)).

The areas' goal is to maintain appropriate natural communities in a condition suitable to the species to ensure the Florida sandhill cranes occurring on these WMAs function as a part of the regional population. While these properties have a role in supporting the regional sandhill crane population, ultimately, the continued existence of this species on these WMAs is dependent on conditions that influence the regional population. However, the amount of potential habitat on the conservation lands in this part of Florida, including these WMAs, in combination with the current use of nearby private lands, greatly enhance the chance of persistence for this species.

3.2.13: Limpkin

Limpkins occasionally occur on HH/BCWMA and are rarely seen on TNRWMA. Nesting has not been documented. Limpkins typically inhabit freshwater marshes, swamps, springs, and spring runs. Limpkins are highly mobile and influenced by regional water levels and the availability of prey items, including apple snails (*Pomacea paludosa*). The status and distribution of apple snails on both WMAs is unknown; although the best potential habitat for apple snails (and limpkins) occurs along Bull Creek.

Limpkins are a FWC-listed species of special concern and trigger 1 of 6 prioritization parameters ([priorities table](#)). On HH/BCWMA, models identified 5,888 acres of potential habitat with 5,892 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 4,001 acres of potential habitat. It is not known if this is enough habitat to support an independent population of limpkins, but limpkins using either WMA are part of a larger regional population. Regionally, limpkins are known to occur throughout this portion of Florida with records on TLWMA. The Florida Breeding Bird Atlas has confirmed breeding of limpkins in Osceola County.

Prescribed fire in wet prairie and wet flatwoods enhances foraging opportunities and can prevent shrub encroachment of wetland systems. Allowing prescribed fire to burn into marsh systems will maintain or improve habitat conditions and continue to promote use of these wetlands by limpkins. As mentioned above, Bull Creek and its associated riparian community represent the best potential habitat for limpkin on these WMAs. Typically, these creek systems and riparian edges are within non-managed natural communities. Unless there is a need for treating exotic species or restoration from past human actions, these communities need little directed management. Bull Creek, however, has been negatively affected by past water retention practices that have flooded the canopy hardwoods. The loss of these canopy trees resulted in an explosion of wetland vegetation within Bull Creek's main channel. This excess vegetation has reduced water flow to the point where the main channel is difficult to identify and is not navigable. Restoration of this creek system could improve its suitability for apple snails and enhance the creek's potential to serve as foraging and nesting habitat for limpkins. Given the potential to benefit limpkins and wading birds, we recommend a SMA to examine the potential for enhancement or restoration of Bull Creek ([Section 4.1.1](#)). Because this species has significant dispersal capabilities and is impacted by regional water levels, monitoring is not recommended because it would be difficult to determine if any documented change was reflective of local management or regional conditions. However, opportunistic observations of juveniles or nesting will be recorded ([Section 5.2.6](#)). Sections [6.2](#) and [6.5](#) describe coordination recommendations with SJRWMD and FNAI. The areas' goal is to maintain and enhance natural communities to provide high quality wetlands that allow limpkins utilizing the WMAs to function as a part of the regional population. While it is improbable any except the largest of conservation lands could independently sustain a population of limpkins and what happens to the regional population will influence the long-term persistence of this species on these WMAs. However, the proximity of the WMAs to important limpkin habitat on existing conservation lands increases the chance of long-term persistence.

3.2.14: Northern Bobwhite

Northern bobwhite (quail) are common on both HH/BCWMA and TNRWMA, and nesting is common. Staff has used fall covey counts to monitor quail on TNRWMA since 2007. The results of these surveys have varied from a high of 1 bird/2.5 acres in 2007 to a low of 1 bird/3.9 acres in 2008, with an average of 1 bird/2.9 acres. Monitoring of quail on HH/BCWMA during fall 2011 indicated an average of 1 bird/1.9 acres. This represents a very high density of quail on the landscape and is a reflection of the quality of land management applied by area staff. Check stations are used to collect data on quail harvest on both areas. Staff compare these numbers against fall density estimates to ensure a sustainable number of individuals are harvested annually. To date, harvest levels have never exceeded 15% of the fall estimate and typically are less than 5%. Staff also collects wings at the check stations to get an annual ration of juveniles to adults for the population. Quail have experienced significant range-wide population declines since the 1980s and are currently a major focus of many initiatives including the Upland Ecosystem Restoration Project. Quail are typically associated with open canopy forests and grassland communities dominated by warm-season grasses, legumes, and patchy bare ground. Quail

use areas with dense herbaceous cover for brooding and foraging; shrubs or other thickets are useful as roosting habitat or escape cover. Managers can use the frequent application of prescribed fire to create the mosaic of vegetation conditions this species requires to meet its life history needs.

Quail trigger 2 of 6 prioritization parameters ([priorities table](#)). On HH/BCWMA, models identified 15,823 acres of potential habitat with 16,299 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 11,112 acres of potential habitat. As the literature suggests that 2,000-4,000 acres are necessary to support a viable population, it appears these areas do support a viable population.

Monitoring data from TNRWMA would support this conclusion.

Most of the potential quail habitat on both WMAs is currently in good to excellent condition. The focus on using frequent fire in mesic flatwoods and dry prairie has produced, and should maintain, a nice interspersed cover types desired by northern bobwhites. MUs with higher than desired palmetto cover are being roller-chopped in advance of fire. This should further improve habitat conditions for quail. Because ongoing management activities will continue to support a viable local population of quail on both WMAs, no SMA is recommended.

Additional land management recommendations for quail are found in [Section](#)

[4.3.11](#). Monitoring of quail through the continued use of fall covey counts is recommended ([Section 5.2.3](#)). Check stations should continue to monitor harvest rates and collect wings for assessment. Survey results and harvest information should be shared with FWC's quail biologist ([Section 6.1.2](#)).

The goal for both WMAs is to continue to maintain a viable population of bobwhites.

Management actions have produced a very healthy population of quail and it is likely these areas will continue to provide habitat as long as management resources continue to be available. The measurable objectives are:

1. Maintain a 3-year average density of 1 bobwhite per 2-4 acres indefinitely.
2. Over the life of this Strategy, monitor harvest and consider additional regulations if the 3-year average harvest rate exceeds 15% of the area's estimated northern bobwhite population.

3.2.15: Red-Cockaded Woodpecker

Red-cockaded woodpeckers on HH/BCMWA and TNRWMA have a patchy distribution throughout both WMAs and staff manages these birds as a single population (the BC3N population). In 2000, there was 1 active cluster (AC) with 1 potential breeding group (PBG) each on HH/BCWMA and on TNRWMA. The population was low and unstable from 2003-2005, but increased until 2008 when it leveled off at 8 ACs. As of 2012, there were 11 ACs containing 9 PBGs.

The red-cockaded woodpecker requires open, mature pine woodlands that have a diversity of grass, forbs, and shrub species. Red-cockaded woodpeckers nest in cavities in older living pines. Optimal foraging and nesting habitat for the species includes a reduced hardwood component and limited mid-story height. Frequent fire is necessary to maintain the open forest structure this species prefers. This species is management responsive and can be an indicator of properly managed pine stands. It is often considered an umbrella species as many other species benefit from management designed for this species.

Red-cockaded woodpeckers are federally endangered, and this species triggers 4 of 6

prioritization parameters ([priorities table](#)). The only prioritization parameters not triggered are the PVA parameters. However, the results of this PVA should be used with caution as several of the model's assumptions are not suited to this species, and the model had a starting population higher than the known population. This species is a moderate to high priority statewide.

The FWC Red-cockaded Woodpecker Management Plan created 6 management units throughout Florida. The BC3N population exists within the South-Central Peninsula Management Unit. The FWC statewide plan set an objective of supporting 166 ACs with 133 PBGs in the South-Central Peninsula Management Unit by the year 2020. As of 2012, the South-Central Peninsula Management Unit contained 126 ACs with 116 PBGs on public lands plus a handful of ACs and PBGs on private lands. The South-Central Peninsula Management Unit contains 4 metapopulations: Avon Park, Big Econ, Saint Sebastian, and Three Lakes. The BC3N population is part of the Three Lakes metapopulation, which, in addition to the BC3N population, also contains the birds on TLWMA and on a piece of private land south of HH/BCWMA known as Escape Ranch. The FWC statewide plan set an objective of supporting 72 ACs with 58 PBGs in the Three Lakes metapopulation by 2020. As of 2010, the metapopulation had 63 PBGs. While the metapopulation objective has been met, the South-Central Peninsula Management Unit objective has not been met.

At the federal level, the USFWS management plan puts the BC3N population within the larger South/Central Florida Recovery Unit. This Recovery Unit contains multiple conservation lands from Big Cypress National Preserve in the south to Camp Blanding in the north. The federal recovery plan for this species calls for a delisting goal of 400 PBGs in the South/Central Florida Recovery Unit, with a number of populations containing >40 PBGs.

Populations with >40 PBGs are believed to have a higher chance of long-term persistence. On HH/BCWMA, models identified 14,836 acres of potential habitat with 15,519 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 9,163 acres of potential habitat. Depending on habitat conditions, each PBG may need anywhere from 125 to 400 acres, with south and central Florida having some of the largest reported home ranges. The literature suggests that populations with 10 well-clumped PBGs have reasonable short-term persistence; populations with at least 30 well-clumped PBGs should allow for moderate persistence; and at least 100 PBGs are necessary to avoid the risk of inbreeding and stochasticity. Staff estimates the habitat on BC3N could support 47 PBGs in the future.

Staff drafted a BC3N-specific red-cockaded woodpecker management plan to guide management decisions. This plan calls for the addition of 8 new recruitment clusters across both properties in 2011-2015. Discussions with area staff suggest re-evaluating the focus of red-cockaded woodpecker management on these WMAs to support core areas and building around them. This approach has been successful in growing the local area population.

In areas that currently hold ACs and PBGs, existing management activities should be sufficient to maintain this species over time. Management at these sites include frequent prescribed fire on a 2-3 year return interval, with staff applying water or foam around nest trees before the burn to minimize damage. In areas where new clusters are to be located, specific management actions including, but not limited to, exotic species control, midstory control, and palmetto reduction may be required prior to fire. MUs 56 and 57 on HH/BCWMA historically held woodpeckers; these areas are unoccupied as of February 2012. Management activities like mowing and/or roller-chopping in combination with

prescribed fire is recommended to improve habitat suitability. Additional land management recommendations for red-cockaded woodpeckers can be found in [Section 4.3.12](#). Reforestation efforts did not follow the logging that occurred in the early 1900s. As a result, many flatwoods on HH/BCMWA and TNRWMA have pine basal areas that are currently too low for this species, and mature pines that could serve as cavity sites are limited on both properties. These reduced basal areas may reduce connectivity between ACs due to the limited amount of sites where new clusters could naturally occur. Because of the BC3N population's importance in supporting the regional conservation of red-cockaded woodpeckers, and the limited areas in which mature pines currently exist, a SMA is recommended for MUs where recruitment clusters and artificial cavities will be developed ([Section 4.1.2](#)). Additionally, we recommend the monitoring of pine recruitment during OBVM sampling as a means to track natural reforestation. Staff should examine the results of this monitoring over the life of this Strategy to identify potential areas, if needed, where understocked sites exist.

Species management ([Section 5.1.1](#)) includes the addition of new clusters (recruitment clusters), restoration of historical clusters, installation of artificial cavities (inserts, drilled cavity starts, and complete drilled cavities) to supply AC with ≥ 4 suitable cavities, and translocating birds. Management has been successful at increasing this population over the last 10 years. Fledgling production has increased annually since monitoring began. The current population (as of 2011) of 28 individuals includes 8 translocated birds. Staff has translocated 4-6 juvenile red-cockaded woodpeckers to this population every year since 2005 (with the exception of 2010). Of the 34 individuals translocated to these properties, 9 became breeders on-site, 1 joined a cluster as a helper, and 5 became breeders on TLWMA. The 8 translocated birds currently breeding have produced 32 chicks since 2007. Without the infusion of translocated birds, it is unlikely this population would have persisted. The BC3N population has a high number of recruitment clusters, largely because of the requirement to have 2 recruitment clusters available per pair of translocated birds. Recruitment clusters are sites that are currently unoccupied but have foraging habitat and cavity trees in suitable condition. Assuming that existing land management and monitoring continues, there is a high opportunity for these WMAs to support the regional stability of this species.

Population monitoring is required to remain eligible to receive translocated birds. Monitoring activities include determining cluster status, tree activity and cavity use, group size, reproduction, and survival data ([Section 5.2.5](#)). In addition to maintaining the current level of occupied clusters, future management actions will focus on expanding the spatial distribution of red-cockaded woodpeckers on HH/BCWMA and TNRWMA. Staff also should continue to be involved with the red-cockaded woodpecker Southern Range Translocation Cooperative ([Section 6.6](#)).

The area goal is to grow the red-cockaded woodpecker population to 30 PBGs as quickly as possible. Obtaining this goal will require the continuation of resources that allow for the active prescribe fire program, the installation of artificial cavities, and the translocation of red-cockaded woodpeckers. The ultimate goal is to have > 40 PBGs. The measurable objectives are:

1. Ensure all active clusters are maintained annually with at least 4 suitable cavities per cluster for the breeding season.

2. Increase the population to at least 15 PBGs by 2022.

3.2.16: Short-tailed Hawk

The status of the short-tailed hawk on both HH/BCWMA and TNRWMA is unknown; staff has never documented the species on the WMAs. There is a record of an adult short-tailed hawk on TNRWMA from 1989 and another record on Three Forks Marsh Conservation Area from 1992. Conversations with ARCI suggest these properties have good potential to support foraging short-tailed hawks and a limited opportunity for nesting.

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 breeding sites. Transitional zones and ecotones may be important components of foraging habitat for this species. The short-tailed hawk triggers 6 of 6 prioritization parameters ([priorities table](#)), making it a high priority.

On HH/BCWMA, models identified 6,689 acres of potential habitat with 6,124 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 6,849 acres of potential habitat. On HH/BCWMA, the best potential nesting habitat occurs within the variety of narrow cypress strands and the floodplain swamp of Bull Creek. Ecotones here quickly transition from thick shrubs to the more open flatwoods where short-tailed hawks can actively forage. On TNRWMA, most of the potential habitat could be used for foraging due to its open condition. Crabgrass Creek has a narrow band of floodplain swamp adjacent to the creek; it could have some potential to support nesting short-tailed hawks.

Short-tailed hawks are not typically considered management-dependent and the opportunity to influence this species at the management-area level on these WMAs is low. However, ongoing efforts such as prescribed fire, removal of exotic vegetation, and mechanical actions that aid in restoring natural community structure will benefit short-tailed hawks by maintaining the suitability of foraging habitat.

Because this species is not a good indicator of management and is difficult to monitor, no measurable objective or SMA is recommended. Monitoring for this species will be opportunistic ([Section 5.2.6](#)), and should include season and color phase. Observations of this species will be shared with ARCI ([Section 6.4](#)) and FNAI ([Section 6.5](#)). If a nest is identified, nest protection guidelines surrounding the nest site will be followed ([Section 4.3.13](#)).

The goal is to continue to provide suitable foraging and nesting habitat for the short-tailed hawk that will allow individuals using these WMAs to function as part of a regional population. However, the presence of short-tailed hawks on-site is dependent on conditions that influence the larger statewide population.

3.2.17: Southern Bald Eagle

Staff report occasionally seeing bald eagles flying through HH/BCWMA and TNRWMA. Five nests have been documented within 5 miles of these WMAs, including one

nest in the southwest corner of TNRWMA. This nest was last active in 2007(it was surveyed last in 2009). These properties occur several miles east of the Kissimmee Chain of Lakes, a core nesting area for bald eagles as identified by the FWC Bald Eagle Management plan. The bald eagle does not trigger any of the prioritization parameters ([priorities table](#)), but is protected by specific legal rules and requirements under the Bald and Golden Eagle Protection Act. The FWC approved a Bald Eagle Management Plan in 2008 to ensure the continued recovery of this species. On HH/BCWMA, models identified 2,986 acres of potential habitat with 2,824 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 3,436 acres of potential habitat. Southern bald eagles are habitat generalists, use a number of natural communities, and are not typically considered management-dependent. Eagles generally nest within forested areas close to large amounts of open water where fish and other prey can be easily obtained. Because large bodies of water are not found on or adjacent to either HH/BCWMA or TNRWMA, these areas will have a reduced role in the conservation of this species. However, ongoing efforts to maintain both areas' natural community structure and function will benefit this species by providing potential foraging or loafing habitat for individuals moving across the landscape. Management actions that maintain or enhance habitat for this species include managing for mature stands, and applying prescribed fire and mechanical actions that aid in restoring natural community structure. Actions to enhance or restore the flow of Bull Creek ([Section 4.1.1](#)) may provide additional foraging habitat to eagles. There are no specific management activities recommended for this species, there is no need to establish a SMA, and no need to establish measurable objectives. If bald eagle nesting is documented on site, the nest will be reported via the FWC eagle nest website. Managers will follow management guidelines around existing and future nesting sites ([Section 4.3.14](#)).

The area goal is to provide suitable habitat that will allow individuals using these WMAs to function as part of a regional population. While the continued use of these WMAs by the bald eagle is dependent on conditions that influence the regional population, the recent population growth experienced by the species and the occurrence of core nesting areas nearby increases the potential for continued use.

3.2.18: Wading Birds

Of the 8 focal species of wading birds, the white ibis (*Eudocimus albus*) is commonly seen, and the wood stork (*Mycteria americana*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), and tricolored heron (*E. tricolor*) are occasionally seen on these areas. The little blue heron (*E. caerulea*) is rarely seen, and the roseate spoonbill (*Platalea ajaja*) and reddish egret (*E. rufescens*) are not typically seen on either WMA. There are no nesting colonies documented on either WMA.

Statewide, this group of species is a moderate priority ([priorities table](#)). Several species are FWC-listed species of special concern and the USFWS lists the wood stork as endangered. The Millsap biological scores for the reddish egret, little blue heron, and wood stork are high. Florida's Wildlife Conservation Plan identified the snowy egret, little blue heron, and roseate spoonbill as having declining population trends, while the tricolored heron and white ibis have unknown trends. Reddish egret and roseate spoonbill were identified as having low population status. On HH/BCWMA, models identified 8,771 acres of potential

habitat with 8,567 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 4,313 acres of potential habitat. Natural community management that includes prescribed fire and exotic plant control in wet prairie and wet flatwoods will enhance and maintain these natural communities in good condition for wading birds. Nesting colonies typically occur within areas of high shrub or tree cover over open water. On both properties, this type of habitat is not common; the exception being portions of the riparian edge along Bull Creek. Given this, the SMA to investigate enhancement or restoration of Bull Creek has good potential to benefit this group of species ([Section 4.1.1](#)). Opportunistic documentation of any nesting activity is recommended ([Section 5.2.6](#)), and any known nesting colonies will be protected from disturbance ([Section 4.3.15](#)). The goal is to enhance and then maintain the suitability of habitat for these species to allow the wading birds using these WMAs to function as part of a regional population. By maintaining suitable foraging and potential nesting habitat, these WMAs, in combination with other public lands, can increase the potential for the regional persistence of wide-ranging species like wading birds. While regional water management decisions will influence the long-term persistence of these species on both WMAs, it is likely both properties will continue to see use by wading birds due to large amount of conservation lands throughout this region.

3.2.19: Florida Black Bear

Black bears, or their sign, are rarely noted on either HH/BCWMA or TNRWMA. Both properties are not associated with the primary or secondary range of any of the state's major bear populations as identified by the [FWC Bear Management Plan](#). The nearest known population of bears occurs within the Glades/Highlands population located in Glades and Highlands Counties on the west side of the Kissimmee River. Black bear are capable of significant dispersal; however, it is typically dispersing males that move long distances. Because females tend to establish a home range near where they were born, this species is slow to colonize new breeding territory, and tends to grow out from existing populations. Therefore, it is unlikely these WMAs will be part of a breeding population in the near future. Formally FWC-listed as threatened, FWC removed the black bear from the threatened list in 2012 after biological review and the development of a statewide Bear Management Plan. This species triggers 2 of 6 prioritization parameters ([priorities table](#)). Home range sizes vary according to resource availability and the level of habitat fragmentation on the landscape. A mosaic of flatwoods, swamps, scrub oak ridges, bayheads, and hammocks provides adequate den sites, a diversity of seasonally abundant food sources, and cover when traveling between these habitat types.

On HH/BCWMA, models identified 18,218 acres of potential habitat with 21,607 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 11,303 acres of potential habitat. While this is not enough habitat to support an independent population, it is adequate for providing foraging habitat for individual bears that are moving through the landscape. Given the distance between occupied bear range and HH/BCWMA and TNRWMA, these WMAs have a low opportunity to affect the conservation of bears. Conversations with FWRI's bear research staff supports the conclusion that bears occurring on these WMAs are most likely moving through the

landscape in search of mates or new territories. Because of this, the role of HH/BCWMA and TNRWMA is to support this species by providing travel corridors for dispersing individuals.

Existing management actions should be sufficient to support the area's role for bears, therefore no SMA is recommended. These large areas with limited human activity and the interspersed creeks and wetlands should provide enough space and cover for individual bears moving through the landscape. While denning is very unlikely on these WMAs, staff should follow additional management recommendations if dens are located or suspected ([Section 4.3.16](#)).

Monitoring Florida's bear population is best done at the landscape level by the FWC's Bear Management Program, and there is no need for area-specific bear monitoring. Opportunistic documentation of bear sightings should be noted and any dens should be reported to FWRI ([Section 6.1.3](#)). The goal for both areas is to promote suitable dispersal habitat for black bears, where appropriate.

3.2.20: Florida Panther

Panthers, or their sign, are a rare occurrence on both HH/BCWMA and TNRWMA. However, radio-collared panthers [dispersing males] have been documented on both properties and on private lands adjacent to the WMAs. These WMAs do not fall within the primary or secondary range for this species as identified by the USFWS Panther Recovery Plan. Florida panthers use a variety of habitats that generally consist of forested uplands and wetlands interspersed with open habitats, such as freshwater wetlands, dry prairie, old fields, pasture, and agricultural land. While several studies found a proportionally higher use of forested habitat types, non-forested habitats are important for hunting and maintaining prey species and serve as travel corridors between resting sites. This species triggers 4 of the 6 statewide prioritization parameters ([priorities table](#)) and is a high priority.

On HH/BCWMA, models identified 15,944 acres of potential habitat with 16,243 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 9,670 acres of potential habitat. Primary habitat zones for Florida panther, as identified by the federal Recovery Plan, occur south of the Caloosahatchee River. This river defines the northern boundary of the breeding range for this species. Despite this, dispersing males are known to move north of the river and do occasionally pass through these WMAs.

While HH/BCWMA and TNRWMA are not part of the primary or secondary range of Florida panthers, a model did identify these WMAs as part of a >124 square mile patch of potential habitat north of the Caloosahatchee River that panthers could use for future population expansion. The report suggested these WMAs, along with TLWMA, would have good connectivity with potential panther habitat on a nearby patch that includes the Avon Park Air Force Range and other conservation lands adjacent to the Air Force Range (> 602 square miles of potential habitat). Establishment of a population here, however, would require the natural movement of breeding females north of the Caloosahatchee River or the translocation of individuals into these habitat patches. The likelihood of any translocation activities occurring is extremely low. Given these factors, both WMAs have a moderate opportunity to support the occasional dispersing male panther that moves northwards from their primary and secondary zones.

As with black bears, existing management actions should be sufficient to support the area's role for panthers; therefore, no SMA is recommended. These large WMAs with limited human activity and the interspersed creeks and wetlands should provide enough space and cover for individual panthers moving through the landscape.

FWC's panther management team ([Section 6.1.7](#)) monitors the panther population, so additional systematic monitoring by local staff is unnecessary. Area staff should coordinate directly with FWC panther biologists for anything specifically related to panthers on these WMAs. [Section 5.2.6](#) describes the opportunistic monitoring recommended for this species. The goal for both WMAs is to promote suitable foraging habitat and travel corridors for panthers, where appropriate. However, until breeding panthers move north of the Caloosahatchee River, these areas will continue to see only an occasional panther dispersing through the landscape.

3.2.21: Sherman's Fox Squirrel

Fox squirrels are infrequently seen on either WMA. Historic records show numerous fox squirrel sightings on properties to the south, west, and north of these WMAs. There are recorded observations from TLWMA and several records from Escape Ranch to the southeast. Other records come from Lake Lizzie Nature Preserve (Osceola County), Lake Kissimmee State Park, and several private lands.

This FWC-listed species of special concern triggers 4 of 6 prioritization parameters ([priorities table](#)). Suitable habitat for Sherman's fox squirrel includes longleaf pine sandhills or flatwoods with a mixture of pines and oaks and a sparse to moderate shrub layer.

Sherman's fox squirrels appear to do best in mature longleaf pine stands maintained with fire that results in an open understory with an oak component. 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 ensures a year-round supply of food items that vary seasonally.

On HH/BCWMA, models identified 11,273 acres of potential habitat with 11,385 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 8,813 acres of potential habitat. The fox squirrel is a wide-ranging species and the literature suggests 2,000-9,000 acres of suitable habitat are required to support a population. Given this, the combined habitat on these WMAs should be enough to support a local population. However, much of this potential habitat is mesic flatwoods with a dwarf live oak (*Quercus minima*) component, which may not provide nesting or refugia habitat for this species. Additionally, because of logging that occurred in the early 1900s, the number of mature pines is limited on these WMAs, and this may influence their suitability for fox squirrels. Therefore, while these WMAs have a moderate role in supporting the regional population, it will be important to maintain additional habitat for fox squirrels on adjacent public and private lands.

Management actions that maintain or enhance habitat for fox squirrels include prescribed fire and mechanical actions that aid in restoring natural community structure, and timber management that results in open, mature pine forests. Because ongoing management will meet the needs of this species, no SMA is recommended. Area staff recommends burning the Yates tract more frequently as fox squirrels used to be more common in this area.

Staff believe the groundcover has become more dense in this tract after the removal of cattle, and increased burning could improve conditions. Because this species naturally occurs at low densities and can be difficult to detect, no specific monitoring aside from opportunistic documentation is recommended ([Section 5.2.6](#)). Measurable objectives are not recommended for this species.

The goal for these WMAs is to provide suitable habitat for Sherman's fox squirrels that allows the individuals using these WMAs to function as part of the regional population. Because habitat availability and management on private lands affects the continued regional presence of fox squirrels, FWC staff from Conservation Planning Services ([Section 6.1.5](#)) should work with private landowners to identify and maintain suitable conditions.

3.2.22: Limited Opportunity Species

Two focal species (Florida grasshopper sparrow and snail kite) modeled (using statewide data) to have potential habitat on these WMAs lack reasonable opportunity for management. Opportunistic observations of these species should be documented ([Section 5.2.6](#)). If any of these species are documented with increasing regularity, the areas' role in their conservation and recovery should be re-visited.

Florida Grasshopper Sparrow - Florida Grasshopper Sparrows currently do not occur on either HH/BCWMA or TNRWMA. Both WMAs exist outside of the historic range of this species; the northernmost historic observation of Florida grasshopper sparrows is near Kenansville and the TLWMA, approximately 10 miles south. Land surveys of the area during the late 1800s noted the transition to longleaf pine flatwoods around Lake Marian (on TLWMA) and the dominance of the flatwood community northwards towards HH/BCWMA and TNRWMA. The increasing dominance of these flatwoods would have significantly reduced any possibility of Florida grasshopper sparrows moving northward to occupy the small pockets of dry prairie in northern Osceola County.

The Florida grasshopper sparrow is believed to need large patches of treeless dry prairie. On HH/BCWMA, models identified 527 acres of current potential habitat with 530 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 479 acres of potential habitat. However, the patches of dry prairie on these WMAs are small and scattered, and would not be large enough to support the Florida grasshopper sparrow.

While models identified potential habitat for this species, both WMAs occur outside the historic range, and the small isolated patches of dry prairie are not large enough to support the species. The nearest known population on TLWMA is beyond dispersal distance and there are no current records of Florida grasshopper sparrows on adjacent private lands near HH/BCWMA or TNRWMA. Because of these factors, the opportunity for management on HH/BCWMA and TNRWMA to affect the conservation of Florida grasshopper sparrows is limited. However, opportunistic observation of this species will be documented and trigger a re-assessment of these WMAs' role.

Snail Kite - Area staff have never documented snail kites on either HH/BCWMA or TNRWMA. Nesting has not been documented and it is unlikely to occur on either WMA. Snail kites prefer large, contiguous patches of wetland habitat and are dependent on apple

snails for food. To be suitable for snail kites, wetlands must have an interspersed of emergent vegetation and open water. Snail kites also utilize shallow lake habitat when snails are available.

On HH/BCWMA, models identified 701 acres of potential habitat with 641 acres modeled to occur if management could restore all natural communities. On TNRWMA, models identified 1,074 acres of potential habitat. Most of the WMAs' potential habitat for snail kites occurs within small, isolated, depression marshes that snail kites may use sparingly for foraging, but these wetlands are unsuitable for nesting snail kites.

Regionally, snail kites forage and nest in Lake Kissimmee and Lake Tohopekaliga to the west of TNRWMA. Conversations with FWC's Snail Kite Coordinator indicate that snail kites are unlikely to travel very far from these major bodies of water unless conditions change dramatically; therefore, HH/BCWMA and TNRWMA have a limited potential to affect the regional stability of this species. Although the species is a high statewide priority, the opportunity for area managers to affect the species is low. The University of Florida monitors snail kites on a statewide level, so additional monitoring on these WMAs is unnecessary. Monitoring for this species will be opportunistic ([Section 5.2.6](#)), and coordination with FWC's snail kite coordinator is recommended if these areas' role should change ([Section 6.1.1](#)).

3.3 Other Listed and Locally Important Species

While natural community management focused on 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. Additionally, Florida statutes direct conservation land managers to manage for imperiled species. In this subsection, we discuss listed or locally important species that were not focal species.

It is possible other imperiled species occur on these WMAs, and if encountered, staff will document these encounters. Imperiled species on HH/BCWMA and TNRWMA should continue to benefit from FWC's ongoing management actions that aim to restore natural communities' structure and function. Florida's imperiled species are adapted to these natural communities and have a higher probability of persistence under FWC management actions than in the absence of management.

3.3.1: Other Focal and Imperiled Wildlife Species

American Alligator - Excepting the listed species discussed above, the American alligator (*Alligator mississippiensis*) is the only other listed wildlife species documented on HH/BCWMA and TNRWMA. No specific management actions are necessary to ensure alligators will continue to persist on these areas.

3.3.2: Rare Plants

While no formal rare plant inventory has been conducted, several imperiled plant species have been documented on HH/BCWMA and TNRWMA. The Florida Department of Agriculture and Consumer Services listed the large-flowered rosemary (*Conradina grandiflora*), nodding pinweed (*Lechea cernua*), hooded pitcher plant (*Sarracenia minor*),

long-lipped ladies' tresses (*Spiranthes longilabris*), and giant orchid (*Pteroglossaspis [Eulophia] ecristata*) as threatened. Cutthroat grass (*Panicum abscissum*), plume polypody (*Pecuma [Polypodium] plumula*), and swamp plume polypody (*Pecuma [Polypodium] ptilodon*) are listed as endangered. The protections afforded plants by existing 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 current management on HH/BCWMA and TNRWMA.

Large-Flowered Rosemary - Large-flowered rosemary occurs in scrub communities of central and south Florida. They are largely at risk due to the loss and degradation of scrub communities throughout Florida. The continued use prescribed fire to manage scrub on these WMAs should promote the persistence of this species.

Nodding Pinweed - Nodding [scrub] pinweed occurs in scrub communities of central and south Florida. They are largely at risk due to the loss and degradation of scrub communities throughout Florida. The continued management of scrub on these WMAs with an emphasis on prescribed fire should promote the persistence of this species.

Hooded Pitcher Plant - Hooded pitcher plants will respond well to current management actions focused on the frequent use of prescribed fire in wet flatwoods, prairies, and other sites in which they occur. Pitcher plants survive fire by re-sprouting from rhizomes. In the absence of fire, shrubby species overgrow and out-compete these plants.

Long-Lipped Ladies' Tresses - The long-lipped ladies' tresses is an orchid typically found in wet prairies and pine flatwoods. Management for this species includes the use of prescribed fire to create sunny openings and reduce competition from woody species. Soil-disturbing activities such as bedding and plowing fire lanes can be destructive to these orchids, as would actions that alter the hydrology of their habitat.

Giant Orchid - Giant orchid is typically found in sandhill, scrub, pine flatwoods, and pine rockland natural communities that are actively managed. Management for this species includes the use of prescribed fire to create sunny openings and reduce competition from woody species. Soil-disturbing activities such as bedding and plowing fire lanes can be destructive to these orchids, and should be avoided near known occurrences.

Cutthroat Grass - Cutthroat grass is typically found within flatwoods, wet prairies, and depression marshes. Management for this species includes maintaining natural communities with prescribed fire to maintain open-canopied communities. Removal of exotic groundcover is also beneficial to this species. Timing of prescribed fire in cutthroat grass communities should include burning in the spring or summer to stimulate flowering. Excessive site preparation and soil disturbance should be avoided near known occurrences.

Plume Polypody and Swamp Plume Polypody - Plume polypody and swamp plume polypody are ferns typically found on tree branches or exposed limestone within hardwood hammocks, wet flatwoods, or sinkholes. As these species occur in communities that are not

actively managed, they will benefit from the protection afforded plants occurring on State conservation lands. Staff will take appropriate steps to ensure chemical and mechanical treatments do not negatively affect specific sites known to support these species.

Section 4: Land Management Actions and Considerations

Models identified potential habitat for 23 focal species on these WMAs ([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 prescribed fire methods that produce a mosaic of burned and unburned areas, will promote the habitat conditions necessary for most of these species without the need for further strategic management actions.

However, we may designate SMAs when actions over and above ongoing natural community management are required ([Section 4.1](#)) in a specific location. In order to ensure natural community management addresses the needs of these focal species, the OBVM DFCs are evaluated ([Section 4.2](#)). Some species have specific protective measures or land management considerations that are necessary to ensure their continued use of the property. [Section 4.3](#) provides these recommendations.

4.1: Strategic Management Areas

The intent on these WMAs is to maintain intact natural communities in good condition and to restore degraded or altered natural communities to a condition that will better suit focal species. However, SMAs focus targeted actions on areas with the highest possibility of success and or areas most critical for the conservation of a species on the area. 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.
- On areas with more restoration and enhancement than can be accomplished in short order, identify an area in which to focus specific land or species management actions for the best chance of success. 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 identification to ensure protection against negative alteration.
- Identify areas that are more critical for research or monitoring.
- Recommend OBVM DFCs in a specific area to benefit a particular species when we would not want to change the DFCs in the natural community area-wide.

Workshop participants agreed on the need for a SMA on HH/BCWMA. This SMA would focus on investigating the potential for the enhancement or restoration of Bull Creek's main channel. Another SMA occurring on both WMAs is recommended for the creation of additional red-cockaded woodpecker recruitment clusters. Staff developed a SMA-specific goals and strategies to guide management for each SMA. In 2015, the Strategy Revision

included the Gopher Tortoise Recipient Site SMA to document management and monitoring associated with the relocation of gopher tortoises from the site of the shooting range to an appropriate on-site recipient site. We define goals, objectives and strategies in [Section 1](#).

4.1.1: Bull Creek Restoration SMA

During the 1990s, a large amount of water was held on Bull Creek for a period of several weeks. Because of this, canopy hardwoods and other shrubs quickly died within the floodplain swamp. Loss of canopy trees allowed more sunlight to reach the creek's surface, which resulted in an explosive growth of tussocks, myrtle, and other aquatic vegetation. The growth of this vegetation has continued to the point where the main channel is no longer navigable. Because of this and the reduced flow within the creek's main channel, staff has identified this SMA ([Figure 2](#)) to investigate the potential to apply specific actions to restore plant communities that will benefit a number of species.

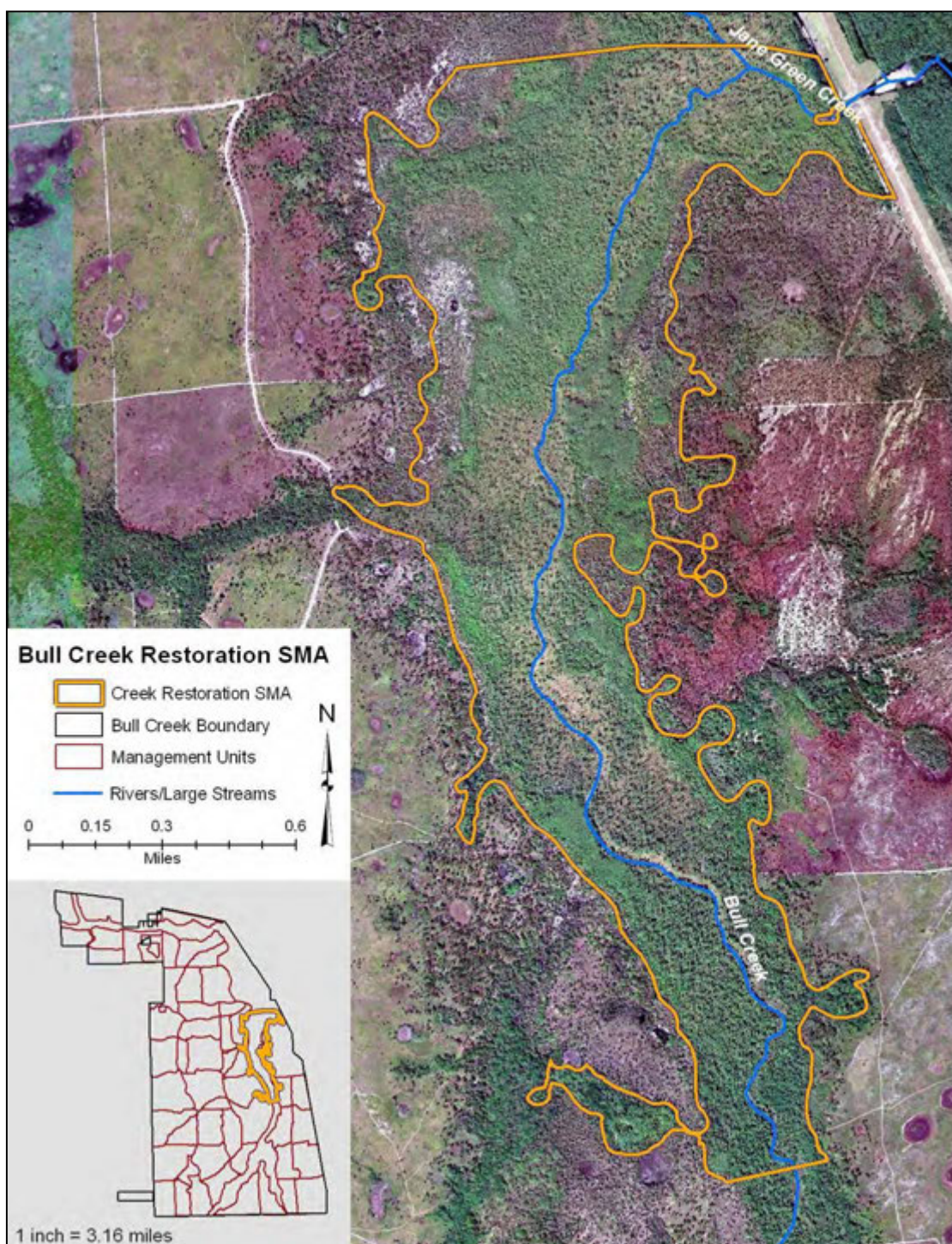


Figure 2: Geographic area associated with the Bull Creek Restoration Strategic Management Area on HH/BCWMA.

The property was acquired for water retention purposes and various state and federal water management agencies require that Bull Creek maintain the ability to hold water during flood events. Therefore, full restoration of Bull Creek is unrealistic. Enhancement of the

creek's main channel is a more achievable outcome, and there may be specific management actions that would increase flow to the main channel and restore plants that provide wildlife value. Management actions taken to enhance the creek's flow and manage aquatic vegetation should provide habitat benefits to wading birds, limpkins, and other wildlife.

SMA Goal: Enhance habitat conditions for wading birds, limpkin, and other wildlife species by increasing or restoring flow within the main channel of Bull Creek and restoring appropriate vegetation.

SMA Objective 1: By 2015, determine the feasibility of implementing a plan for enhancing or restoring Bull Creek.

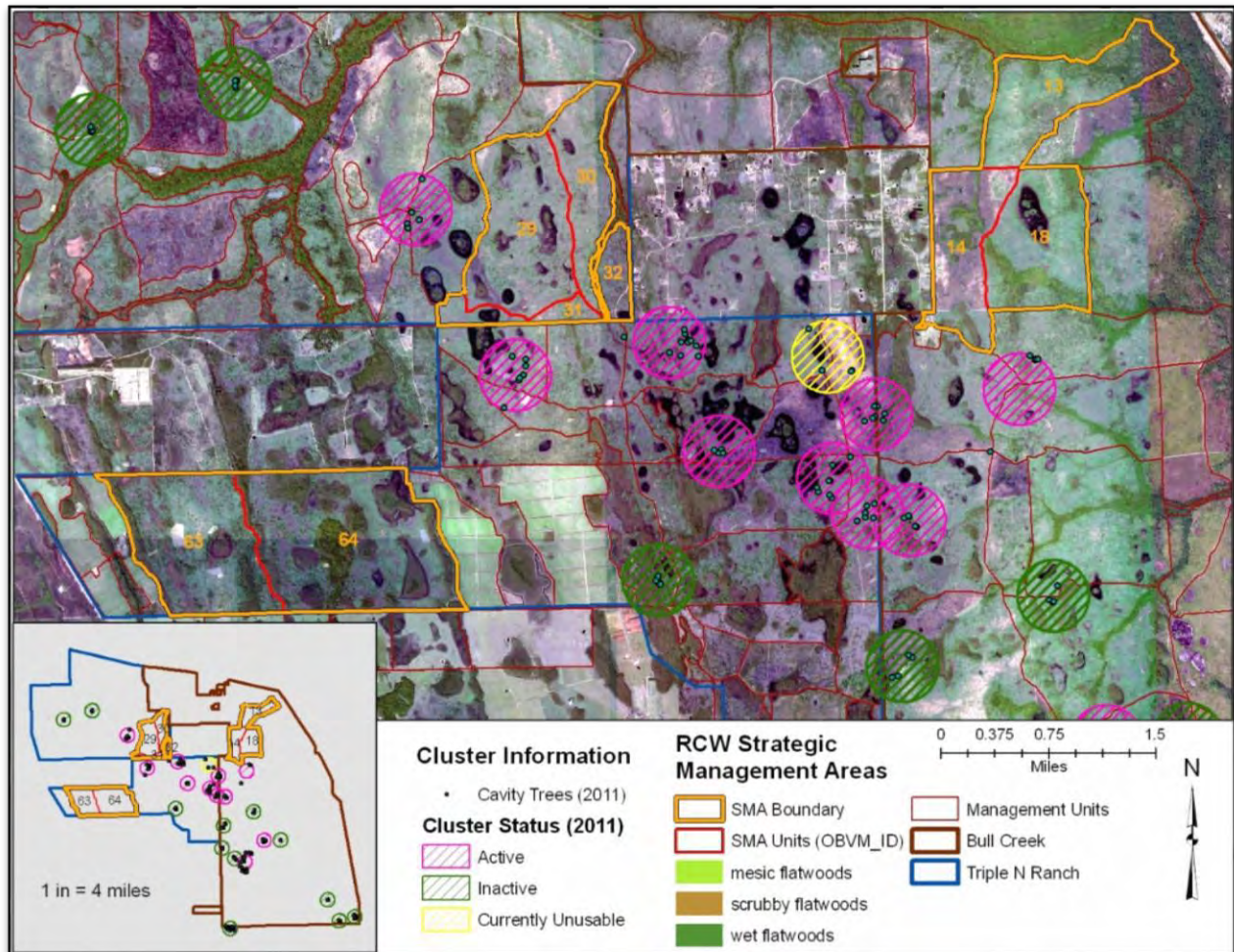
Description of the SMA: The portion of Bull Creek identified in this SMA occupies approximately 880 acres of floodplain swamp in MU 6 from the water control structures on HH/BCWMA's eastern boundary south to Ronnie Ford crossing. The floodplain swamp and main creek within this SMA has lost most, if not all, of its canopy hardwoods. The dominant plant species that have choked the main channel include black willow (*Salix nigra*) and the exotic Cuban bulrush [burhead sedge] (*Oxycaryum cubense*), although other species are present. Due to the loss of canopy hardwoods, large tussocks of vegetation have become prolific and clogged the main channel. The tussocks and other vegetation have greatly reduced Bull Creek's water flow, and much of the creek within the SMA is no longer navigable.

Strategy: Because specific actions to enhance or restore the creek are uncertain at this time, the strategy for this SMA is to initiate discussion on what enhancements are feasible, to determine the interest of other agencies in affecting these enhancements, and to determine the cost the project. Enhancement or restoration of Bull Creek will involve participation from multiple state and federal agencies. Staff anticipates the need to involve SJRWMD ([Section 6.2](#)), the Army Corps of Engineers, and FWC's Aquatic Habitat Restoration and Enhancement (AHRE) section ([Section 6.1.4](#)). However, it is possible that additional agencies will be identified. These discussions should focus on defining project goals, objectives, and strategies; identifying opportunities and limitations; and the development of a project proposal that includes costs and timelines.

4.1.2: Red-Cockaded Woodpecker SMA

Staff designated a SMA to facilitate expansion of the BC3N red-cockaded woodpecker population ([Figure 3](#)). The purpose of this SMA is to identify the MUs where applying specific actions will facilitate the expansion of the local red-cockaded woodpecker population. Management within the red-cockaded woodpecker SMA will facilitate the growth of the current "core" population and will provide connectivity to the larger Three Lakes metapopulation. Past management and monitoring has shown that when concentrated effort is applied, red-cockaded woodpeckers respond.

Figure 3: Management units and natural communities associated with the red-cockaded woodpecker Strategic Management Area on HH/BCWMA and TNRWMA. Figure also shows the location of current red-cockaded woodpecker clusters.



The [USFWS red-cockaded woodpecker recovery plan](#) provides guidance on use of recruitment clusters. Typically, clusters should be no closer than 0.25 miles to active clusters, and no further than 2 miles. The preferred distance is no further than 1 mile from active clusters. Because the BC3N population receives translocated birds, there is the requirement to have at least 2 available recruitment clusters for each pair of birds translocated to the population. MUs in this SMA currently contain large diameter pines that can serve as cavity trees. This is important, as much of the mesic flatwoods in these WMAs have limited numbers of mature pines, and this constrains efforts to create recruitment clusters in the most desired locations. Because the SMA is close to currently occupied clusters, it will provide recruitment and dispersal habitat for individuals currently using these WMAs, as well as for birds that may be translocated. This SMA will concentrate new restoration and management efforts for red-cockaded woodpeckers in MUs where staff will install new recruitment clusters. This SMA will not reduce monitoring or management activities already occurring

within existing active or recruitment clusters on either WMA.

Desired habitat conditions for red-cockaded woodpeckers include open, mature pine woodlands that have a diversity of grasses and forbs. Invasive exotic plants must be controlled to enhance native plant diversity and to allow for safe prescribed fire. Fire is an important aspect in red-cockaded woodpecker ecology. Increased hardwoods favor red-cockaded woodpecker predators and competitors; therefore, growing season burns are conducted to decrease the hardwood component. Further, fire increases the abundance of red-cockaded woodpecker prey, and may increase the nutritional value of prey. On both WMAs, staff uses prescribe fire to achieve optimal habitat conditions in longleaf pine flatwoods. Fortunately, most of the natural communities within this SMA appear to be in good condition, except for the limited number of mature pines. Where pockets of midstory oaks or excessive palmetto cover reduce habitat suitability for red-cockaded woodpeckers, staff will combine prescribed fire with mechanical vegetation management (e.g., mowing or roller-chopping). To meet the vegetative DFC, staff strives to maintain red-cockaded woodpecker clusters on a 2-3 year average burn rotation.

While vegetative conditions within MUs identified in this SMA generally appear to be good, the availability of suitable cavities appears to be the limiting factor. This is not uncommon on many sites where red-cockaded woodpecker populations persist and artificial cavities can quickly provide nesting and roosting opportunities. Installation of these cavities has been successful in facilitating population expansion. Staff will work with the TLWMA red-cockaded woodpecker biologist and other experts to determine the appropriate time and location for installation of artificial cavities within this SMA. Mesic flatwoods within the SMA have longleaf pines with diameters that will support now, or in several years, the installation of artificial cavities.

SMA Goal: Enhance habitat conditions for red-cockaded woodpeckers to facilitate occupation of the area by the species thereby enhancing connectivity between the currently occupied clusters on these WMAs and within the larger Three Lakes metapopulation.

SMA Objective 1: Create 2-4 recruitment clusters within the SMA by 2020.

SMA Objective 2: Maintain a 3–year average prescribed fire interval in red-cockaded woodpecker habitat within the SMA.

Description of the SMA: The red-cockaded woodpecker SMA includes 2,177 acres of scrubby, mesic, and wet flatwoods in MUs 29, 30, 31, 32, 63, and 64 on TNRWMA and in MUs 13, 14, and 18 on HH/BCWMA. A red-cockaded woodpecker foraging matrix model completed by the local red-cockaded woodpecker biologist previously identified MU 63 and 64 as potentially suitable for recruitment clusters. Foraging matrix models have not been completed for HH/BCWMA, but area staff previously identified portions of MU 13 and 14 as suitable for recruitment clusters. Acres of scrubby, mesic, and wet flatwoods habitat within each MU are listed below.

HH/BCWMA - 899 acres

MU 13: 355 acres consisting of 187 acres mesic flatwoods, 108 acres wet flatwoods, and 60 acres scrubby flatwoods

MU 14: 251 acres consisting of 220 acres mesic flatwoods and 31 acres scrubby flatwoods
MU 18: 293 acres consisting of 281 acres mesic flatwoods and 12 acres scrubby flatwoods

TNRWMA - 1,278 acres

MU 29: 285 acres consisting of 280 acres mesic flatwoods and 5 acres scrubby flatwoods
MU 30: 191 acres consisting of 178 acres mesic flatwoods, 11 acres wet flatwoods, and 2 acres scrubby flatwoods
MU 31: 38 acres consisting of 37 acres mesic flatwoods and 1 acre scrubby flatwoods
MU 32: 69 acres mesic flatwoods
MU 63: 370 acres consisting of 333 acres mesic flatwoods and 37 acres scrubby flatwoods
MU 64: 325 acres mesic flatwoods

Not all of the 2,177 acres of flatwoods are suitable as red-cockaded woodpecker recruitment cluster sites. Much of these flatwoods have longleaf pines that are currently too small in diameter to support the installation of artificial cavities. However, staff have identified core areas within this SMA where pines have suitable diameters (≥ 13 inch at breast height) to support cavity installation. Acreage that is not currently suitable to support recruitment clusters will function as foraging habitat.

Strategy: The main strategy is to continue natural community management and to identify the locations most suitable for recruitment cluster installation that will provide the best opportunity for population expansion. This SMA could theoretically hold 7 recruitment clusters (assuming a minimum of 300 acres of foraging habitat per cluster in sites with lower pine densities) within its defined area, and the number would increase when considering the additional foraging habitat adjacent to, but outside, of the defined SMA acreage. However, not all acres have suitable pine trees for cavity creation. Potential recruitment sites within TNRWMA's MUs 63 and 64 are 1.5–2 miles from active clusters and provide the potential for a closer link with the red-cockaded woodpecker population on TLWMA. While the literature suggests recruitment clusters be closer than this recommendation, the fact that birds are known to move from the BC3N population to the TLWMA population supports the concept that this distance is not unrealistic for red-cockaded woodpeckers in this part of Florida. Potential sites within HH/BCWMA's MUs 13, 14, and 18 are within the recommended distance for recruitment clusters (0.5–1.5 miles from active clusters) and will support the expansion of the existing core population.

Staff has maintained a 2-3 year burn rotation within the mesic flatwoods of this SMA. Because of this fire history, midstory oaks are not a management concern and groundcover diversity is good. The continued emphasis on growing season fire should maintain or enhance this diversity. Exotic plant species are not a major management concern within this SMA. Meeting the objectives for this SMA will require the continued use of prescribed fire and the identification of areas with large diameter pines where recruitment clusters can be created through the installation of artificial cavities. Area staff will continue to work with the local red-cockaded woodpecker biologist in identifying proper sites for recruitment clusters. Depending on the site, some midstory control or mechanical removal of vegetation may be required.

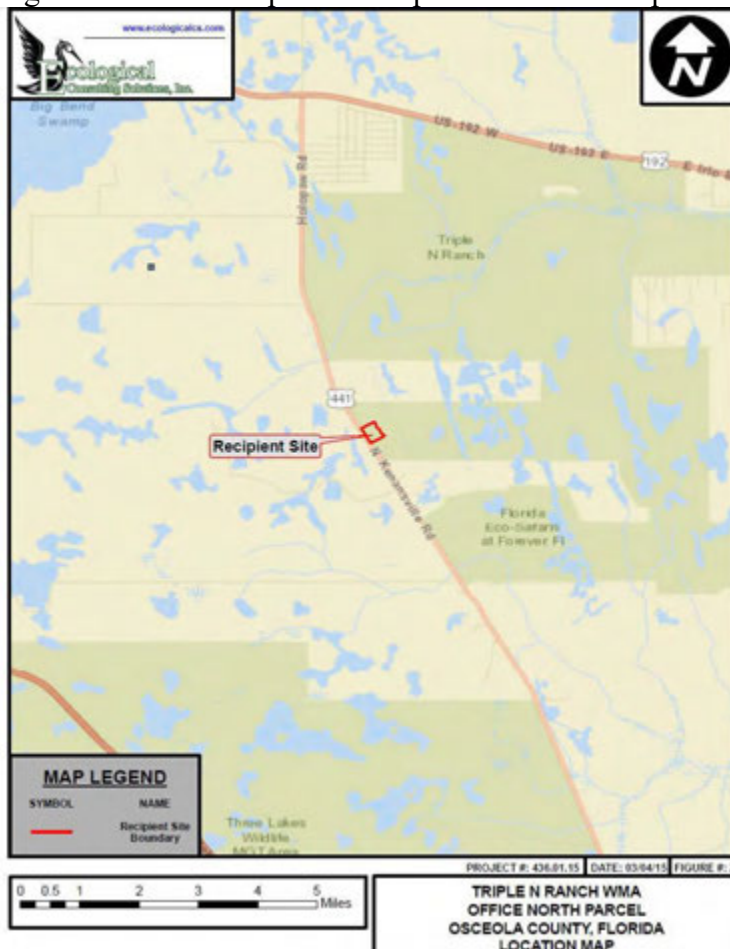
To achieve the objective of creating 2-4 recruitment clusters, area staff will install 8- 16 artificial cavities. In all cases, a minimum of 4 suitable cavities will be available in each

recruitment cluster. However, the actual number of cavities will depend on habitat conditions and population needs at the time of installation.

4.1.3: Gopher Tortoise Recipient Site SMA

Staff designated the Gopher Tortoise Recipient Site SMA to document management and monitoring needs of the 40-acre gopher tortoise recipient site, per the requirements outlined in the [Gopher Tortoise Permitting Guidelines](#) (Appendix 12; Restocking Guidelines for Publicly Owned Conservation Lands). The designation of this SMA is to ensure that future management and monitoring actions will maintain and enhance habitat for the relocated gopher tortoises. The 40-acre recipient site received gopher tortoises from a site located on TNRWMA 3 miles to the east ([Figure 4](#)) of where shooting range construction started in April 2015 (See [Section 2.3](#)). The [Gopher Tortoise Permitting Guidelines](#) requires staff to incorporate the changes into the area-wide management plan as a commitment to managing the recipient site to benefit the relocated tortoises. By identifying this 40-acre portion of habitat as a SMA within the WCPR Strategy, FWC will have fulfilled this requirement, as WCPR Strategies are included as an appendix to the [Triple-N-Ranch WMA Management Plan](#).

Figure 4: Locator map of the Gopher Tortoise Recipient Site SMA located along US 441.



The gopher tortoise is a state-Threatened species that is also a candidate for federal listing within the eastern portion of its range (the states of Alabama, Georgia, South Carolina, and Florida). Florida has an extensive history of managing for and mitigating disturbance to the statewide gopher tortoise population, which includes procedures for relocating tortoises off properties slated to be developed. Areas that receive relocated tortoises are referred to as ‘recipient sites’, and the FWC has outlined specific management and monitoring requirements to ensure relocated tortoises have the best possible chance of becoming established and sustained at the new location (see [Gopher Tortoise Permitting Guidelines](#); Appendix 4, Appendix 7). These requirements include specifications for maintaining certain habitat conditions, conducting burrow and vegetation surveys at specified intervals, and a timeline for when management and monitoring actions should occur on the site.

By permitting the 40-acre gopher tortoise recipient site, FWC has committed to conducting the specific actions detailed in the [Gopher Tortoise Permitting Guidelines](#). These actions are detailed as SMA Goals, Objectives, and Strategy for managing the area appropriately. Actions within the SMA can be contracted to external consultants; however, area staff should ensure that actions are accomplished within the designated timeframe.

Because this timeframe extends past the life of this WCPR Strategy, future updates to the HHBCWMA/TNRWMA Species Management Strategy will need to include the monitoring and management recommendations therein. However, monitoring actions can be adjusted to reflect the best available protocol at that time, adhering to statewide strategies for monitoring gopher tortoise populations on public conservation lands.

SMA Goal: Maintain habitat conditions, management considerations, and monitoring recommendations within the SMA as required by the [Gopher Tortoise Permitting Guidelines](#) for relocating tortoises onto public conservation lands.

SMA Objective 1: Maintain the fencing around the temporary enclosure for 6-12 months following release of the last gopher tortoise relocated into the enclosure, checking regularly for breaks until it is removed.

SMA Objective 2: Amend the Fiscal Year 2015/2016 TNRWMA work plan to ensure prescribed burning on the recipient site occurs as early as June 2016.

SMA Objective 3: Conduct a 15% burrow-count survey within the recipient site by July 2018, and repeat the survey once every 3 years so that 5 surveys have been completed by July 2030. After 2030, conduct the appropriate gopher tortoise survey within the recipient site once every 5 years until July 2040, and then once every 10 years thereafter.

SMA Objective 4: Monitor 30% of the burrow-count survey locations for vegetation composition by July 2018, and repeat the survey once every 3 years until July 2030.

Description of the SMA: The recipient site encompasses a 40-acre groundcover restoration field located adjacent to US 441 along the western edge of the property (MU 82, [Figure 4](#)). The recipient site is close to the TNRWMA office, and can be easily accessed by area staff. Prior to its selection as a recipient site, the 40-acre block of former agriculture underwent

groundcover restoration (GCR) to improve the herbaceous component and recruit longleaf pines onto that portion of habitat. The goal of the restoration was to move MU 82 towards a more native mesic flatwoods structure, and staff were planting a seed mix taken from nearby flatwoods on TLWMA. By the time consultants selected MU 82 as the recipient site, a vegetation assessment determined the condition of the habitat. A contracted consultant estimated >80% herbaceous groundcover within the site, which is at an ideal level to support gopher tortoises. Sparse longleaf saplings have recently established on the site, which ensures the habitat will contain low canopy cover for the foreseeable future. In April 2015, consultants constructed a temporary enclosure around the 40-acre recipient site in MU 82 ([Figure 4](#)), and 14 adult gopher tortoises were relocated to the site.

Strategy: The strategy for this SMA is to apply management and monitoring that will fulfill the requirements of the gopher tortoise recipient site, in accordance with the [Gopher Tortoise Permitting Guidelines](#) for Public Conservation Lands. The actions described under this SMA will be accomplished by a combination of area staff and hired consultants. As the WCPR Strategy is reviewed and updated, actions contained within this SMA will be added to future revisions of the WCPR Strategy until they are complete. These actions can be amended to reflect the most up-to-date processes available and authorized in the Guidelines for gopher tortoise monitoring and management following relocation.

Within the first year following relocation, area staff will monitor the enclosure fence around the recipient site to ensure that the fence remains intact as tortoises settle in the new area. For the first month (April-May 2015), staff will check the enclosure weekly and repair any breaks or collapsed fencing along the perimeter. After the first month, area staff can extend the interval for checking once per month until the time when the fence is removed.

The fence shall stay up for a minimum of 6 months following the last gopher tortoise relocated into the enclosure. If area staff begin observing evidence of increased tortoise activity along the perimeter fencing after 6 months, they should consult with the Gopher Tortoise Permit Coordinator whether to take down the enclosure ([Section 6.1.1](#)). After 12 months, staff can remove the fencing without consulting the Permit Coordinator.

Also in the first year following relocation, WHM staff will ensure that management needs for the recipient site are included in the annual work plan. If the work plan does not already contain plans to apply prescribed fire on the site by July 2016, staff will amend it to include the management actions. For the life of the recipient area, staff will continue managing the 40-acre site to maintain and enhance habitat conditions for the gopher tortoise, including burning the area on a 2-3 year rotation.

Beginning in 2018, either area staff or consultants will conduct burrow-count surveys every 3 years to document the success of the relocated tortoises over time. The method prescribed by the [Gopher Tortoise Permitting Guidelines](#) involves surveying at least 15% of the 40-acre recipient site (approximately 6 acres) and counting the number of potentially occupied burrows. Transects will likely comprise 6, 1-acre transects distributed randomly over the site. Surveyors will walk the transects once every 3 years to look for the conspicuous burrow aprons that are inherent to tortoise burrows, and document the number within the transect area that are potentially occupied. Burrow activity will be based on the evidence at the burrow mouth and apron. Because this method relies on recording tortoise burrows based on activity, the surveys should occur during the growing season (March – October in central Florida) to coincide with the time of year when tortoises are most active.

Surveyors will extrapolate the number of potentially occupied burrows found within the 15% of habitat to the total 40 acres as a way of estimating tortoise abundance. Surveyors will repeat these surveys every 3 years for the first 15 years following the relocation (until 2030), at which point, surveys should be repeated every 5 years until 2040. After 2040, the recipient site can be monitored every 10 years along with the rest of TNRWMA. Area staff or consultants will write a report following each monitoring event, which will include a land cover map, soil map, gopher tortoise habitat map, and burrow location map. Area staff or consultants will submit these reports to the Gopher Tortoise Permit Coordinator ([Section 6.1.1](#)). For details on gopher tortoise survey methods within the recipient site, see [Section 5.2.2](#).

During the first 15 years following relocation (until 2030), surveyors will conduct vegetation monitoring on the recipient site at a 3-year interval. Either area staff or a consultant can conduct these vegetation surveys in conjunction with burrow surveys. Vegetation surveys will be conducted on 30% of the recipient site burrow survey transects. Surveyors will establish fixed photo points at each of the vegetation stations at 75-meter intervals to establish qualitative vegetation trends over time. See [Section 5.2.2](#) for more details on the vegetation monitoring protocol. Desirable conditions for tortoises in suitable habitat are included in Table 2 of the [Gopher Tortoise Permitting Guidelines](#). After 2030, area staff can incorporate vegetation monitoring on the recipient site with other gopher tortoise habitat on TNRWMA as a part of regular OBVM natural community monitoring. Area staff or consultants will also write a report detailing the vegetation monitoring findings, which they will provide to the Gopher Tortoise Permit Coordinator after each survey ([Section 6.1.1](#)). For more details on survey methods within the recipient site, see [Section 5.2.2](#).

4.2: Objective-Based Vegetation Management (OBVM) Considerations

Staff will use OBVM to monitor progress towards DFCs of various natural community parameters ([Table 3](#); [Table 4](#)). As such, OBVM will be effective in monitoring progress towards land management strategies.

OBVM is an approach to land management that emphasized maintaining and restoring natural plant communities towards pre-determined desired conditions or outcomes. The OBVM DFCs target a range in values for various habitat parameters within actively managed communities. However, some focal species require a more restricted range in habitat parameters than is reflected in the area-wide DFCs or a species depends on a vegetative parameter that is not currently monitored on the area and we can recommend adding the parameter and provide DFCs. The workshop gave participants the opportunity to evaluate if the current DFCs meet the needs of focal species and if not, to suggest modifications. We use [Section 4.2.1](#) to suggest which parameters should be modified if habitat parameters important to a particular species require a change. The following are common reasons to modify DFCs:

- Our management objective is to obtain maximum habitat suitability for a species that requires a more restricted range of vegetative values than the current DFCs.
- An SMA has been designated that requires DFCs in a specific area to benefit a particular species when we do not want to change the DFCs in the natural community area-wide.

- Workshop participants recommended the addition of a parameter to measure the number of pine seedlings in mesic flatwoods. This data would help staff better meet the needs of the red-cockaded woodpecker.

Mesic **Flatwoods: Pine**
Regeneration (# pines >1 ft and less than 2" dbh): All

Justification: The inclusion of this variable in mesic flatwoods is to provide an opportunity to evaluate natural regeneration of longleaf pine in MUs on these WMAs. Management actions by previous landowners left much of the flatwoods under stocked. Managers need to have information on the location and extent of natural regeneration to determine if other actions are necessary. There is no DFC assigned to this variable at this time as area staff are most interested in collecting baseline information on the amount of regeneration occurring.

Table 3. Desired Future Conditions for specific vegetative parameters in actively managed natural communities at TNRWMA as identified via the OBVM workshop process.

Mesic Flatwoods	
Pine basal area	10 – 50 ft ² /ac
Average maximum shrub height	≤ 2.5 feet
Shrub cover	≤ 25%
Average maximum palmetto height	≤ 3 feet
Palmetto cover	10 - 25%
Herbaceous cover	≥ 25%
Wiry graminoid cover	≥ 10%
Weedy cover	< 2%
Exotics cover	0%
Scrubby Flatwoods	
Pine basal area	10 – 40 ft ² /ac
Average maximum shrub height	≤ 3 feet
Shrub cover	10 - 40%
Average maximum palmetto height	≤ 3 feet
Palmetto cover	5 - 30%
Herbaceous cover	1 - 15%
Wiry graminoid cover	1 - 15%
Weedy cover	< 2%
Exotics cover	0%
Dry Prairie	
Tree stem density	0
Average maximum shrub height	≤ 2 feet
Shrub cover	10 - 40%
Average maximum palmetto height	≤ 2 feet
Palmetto cover	5- 20%
Herbaceous cover	≥ 10%
Wiry graminoid cover	≥ 10%
Weedy cover	< 2%
Exotics cover	0%
Scrub	
Tree presence > 15'	Yes/No
Shrub cover	10 – 40%
Average maximum shrub height	< 5 feet
Bare ground cover	10 – 40%
Weedy cover	< 2%

Exotics cover	0%
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Table 4. Desired Future Conditions for specific vegetative parameters in actively managed natural communities at HH/BCWMA as identified via the OBVM workshop process.

Mesic Flatwoods	
Pine basal area	10 – 50 ft ² /ac
Average maximum shrub height	≤ 2.5 feet
Shrub cover	≤ 25%
Average maximum palmetto height	≤ 3 feet
Palmetto cover	10 - 25%
Herbaceous cover	≥ 25%
Wiry graminoid cover	≥ 10%
Weedy cover	< 2%
Exotics cover	0%
Scrubby Flatwoods	
Pine basal area	10 – 40 ft ² /ac
Average maximum shrub height	≤ 3 feet
Shrub cover	10 - 40%
Average maximum palmetto height	≤ 3 feet
Palmetto cover	5 - 30%
Herbaceous cover	1 - 15%
Wiry graminoid cover	1 - 15%
Weedy cover	< 2%
Exotics cover	0%
Dry Prairie	
Tree stem density	0
Average maximum shrub height	≤ 2 feet
Shrub cover	10 - 40%
Average maximum palmetto height	≤ 2 feet
Palmetto cover	5- 20%
Herbaceous cover	≥ 10%
Wiry graminoid cover	≥ 10%
Weedy cover	< 2%
Exotics cover	0%
Scrub	
Tree presence > 15'	Yes/No
Shrub cover	10 – 40%
Average maximum shrub height	< 5 feet
Bare ground cover	10 – 40%
Weedy cover	< 2%
Exotics cover	0%

4.3: Further Land Management Considerations

Most generalist or wide-ranging species benefit from management that 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 these WMAs continue to fulfill their role in the conservation of these species.

4.3.1: *Gopher Frog*

Gopher frogs frequently move between wetland breeding ponds and adjacent uplands. Avoid placing new firebreaks or roads along wetland ecotones because they can alter or destroy the herbaceous component of pond margins preferred by this species and other amphibians. Wet-lining can be an alternative to mineral firebreaks around wetlands if necessary; however, it is preferred to allow fire to burn through the wetland. Managers will use prescribed fire as the primary tool to remove shrubs and other thick vegetation from pond margins; mechanical treatments may be needed initially, but prescribed fire should be the primary management tool in suitable wetlands. Because it is important to maintain potential breeding ponds in good condition, minimize soil disturbance within 500 yards of potential breeding ponds.

Growing season (April–September) burns, preferably after April, are more beneficial to gopher frogs than dormant season (October–March) burns. This is because growing season burns are more effective at reducing shrub cover and litter in the wetland basin, stimulating the growth of herbaceous emergent vegetation, enhancing the wetland/upland ecotone, and stimulating the reproduction of wiregrass in the surrounding uplands. The most beneficial time to burn is when the wetland is dry. Although growing season fires are preferred, it is better to burn during the dormant season than to avoid burning.

4.3.2: *Eastern Indigo Snake / Florida Pine Snake*

Large upland snakes such as the eastern indigo snake 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, it is important to avoid direct mortality by allowing snakes to move away from the path of the equipment. When practical during land management activities, keep heavy equipment at least 25 feet from areas with a high density of pocket gophers or gopher tortoise burrows. This precaution will help to avoid direct mortality of pine snakes, which regularly use gopher tortoise burrows for refuge, and forage on pocket gophers. When possible, leave coarse woody debris and residual stumps intact to provide cover for both of these snake species. If necessary to reduce smoke management issues, it is acceptable to pile and burn excess logging slash, but leave some debris in the stand to provide cover for these species and their prey. Creating brush piles can provide cover for these species if natural cover is sparse or absent.

4.3.3: Gopher Tortoise

Gopher tortoises are generally less active and spend more time in burrows during the winter months; therefore, mechanical equipment at this time will be less likely to crush or otherwise harm foraging tortoises. To minimize potential negative impacts, in areas where gopher tortoises occur, the timing of land disturbance activities (e.g., roller-chopping, timber removal) should, whenever appropriate, occur during the winter. In addition, 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 the timing of the treatment will affect management results, and conduct the treatment in a way that allows for meeting management objectives while minimizing negative impacts on tortoises. Regardless of timing, take steps (e.g., flagging burrows) to minimize impacts on known burrows.

4.3.4: American Swallow-Tailed Kite

Because swallow-tailed kites exhibit high nest site fidelity, if nests are found on the WMAs, protect known nest sites from disturbance and alteration, and retain all of the tallest pines in the area of nest sites. Minimizing activities above existing management levels within a 330-foot protective buffer around active nests during nest season should reduce the chance of disturbance. If kite activity, particularly if kites are observed carrying nesting material, mobbing, or congregating in groups of 3 or more, is observed during nesting season, this information should be documented and an effort to locate the nest should be made. 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.

http://research.myfwc.com/publications/publication_info.asp?id=47206

While kites have not been documented nesting on either WMA, it is important to preserve future potential nest trees. This can be done by retaining the largest, oldest trees on the landscape during land management activities.

4.3.5: Bachman's Sparrow

Prescribed fire improves habitat quality for Bachman's sparrows, and is the primary land management tool recommended to promote habitat for Bachman's sparrow on both WMAs. Suitable habitat can be created and maintained through frequent (≤ 3 year rotation) use of prescribed fire. The repeated 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 Bachman's sparrows may abandon habitat if fire is excluded for more than 3 years. When using mechanical treatment to reduce palmetto, follow the mechanical treatment with a prescribed burn.

4.3.6: Brown-Headed Nuthatch

This species is a cavity nester that is dependent on the presence of snags for suitable nesting habitat. As such, make an effort to retain snags during land management activities and evaluate the impact of management activities on snags to ensure new snags will replace 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 nesting sites for this species. Take care to retain these particular types of snags.

4.3.7: Burrowing Owl

Burrowing owls have not been documented on either of the WMAs. However, should burrowing owls occupy either WMA, some specific management actions can benefit the species. Artificial perches provide hunting and observation sites for burrowing owls. Wooden fence posts or other perches placed in immediate vicinity of burrows will provide a suitable perch. Placing a T perch near known burrows will not only benefit the owl, but will aid managers in their efforts to avoid burrows during management activities. Cattle grazing will reduce vegetation height to a level that is beneficial for burrowing owls, but cattle may also degrade or destroy burrows by trampling or wallowing in them. Area managers should consider excluding cattle from the immediate vicinity of known active burrows, when feasible. If staff identifies active burrows, staff will provide a 50-foot limited activity buffer from February 15 through July 10. Inside this buffer, staff will minimize activities that may cause nest abandonment or burrow collapse. The SCP regional biologist can be used as a resource to help determine which actions may be problematic.

4.3.8: Cooper's Hawk

During the nesting season (April-July), Cooper's hawks are secretive and intolerant of human disturbance near the nest site. Males show a strong fidelity to nesting territories. For this reason, whenever possible, protect known nesting sites from additional human disturbance, and avoid heavy alteration of the nesting location. Whenever signs of Cooper's hawk nesting (e.g., carrying nesting material, aggressive dive bombing) are encountered, the location should be documented and an effort made to locate the nest.

4.3.9: Crested Caracara

Crested caracaras have high fidelity to their home ranges and nest sites. Cabbage palms should be retained on the landscape in appropriate natural communities as potential nesting sites for this species. Staff will protect known nesting sites and maintain surrounding habitat in suitable condition if individuals are known to occupy a particular MU. If nests are detected, efforts to minimize any increased human activity (above current levels) around these sites will be considered. It is important to note that a technical report requested by FWC on management for caracaras suggests that prescribed fire, mowing, roller-chopping, and or grazing are essential to maintaining the open habitat this species requires. These activities can occur year-round within home ranges and should be limited (but not excluded) when occurring near nest sites. A significant increase in human activity within the home

range or territory can cause caracaras to abandon the area, even outside of the nesting season. Complete management guidelines are available in:

Morrison, J.L. 2001. Recommended Management Practices and Survey Protocols for Audubon's Crested Caracara (*Caracara cheriway audubonii*) in Florida. Florida Fish and Wildlife Conservation Commission, Technical Report No.

18. Tallahassee, FL. 19 pp.

http://research.myfwc.com/publications/publication_info.asp?id=49246

4.3.10: Florida Sandhill Crane

Prescribed fire improves the quality of upland habitat for this species. In known nesting areas, fires should occur, whenever possible, outside of the nesting season, which occurs from December to June. However, the use of fire around nesting areas a month or two before chicks hatch may improve brood habitat. Because the presence of standing water is a major feature of nesting sites for cranes, prescribed fire from surrounding uplands should generally not directly impact nests. Staff, however, should minimize the likelihood of fire directly burning nests. Reducing disturbance to nest areas decreases chances of abandonment or other negative impacts. Consider seasonality of wetland management activities to avoid flooding or draining of nests. To ensure management is conducive with the needs of this species, follow the management guidelines found at:

Stys, B. 1997. [Ecology of the Florida sandhill crane](#). Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program Technical Report No. 15. Tallahassee, FL. 20 pp.

4.3.11: Northern Bobwhite

The primary land management tool used to benefit northern bobwhite is the frequent use of prescribed fire. Ignite fires using a variety of firing techniques and environmental conditions with the goal of promoting a mosaic burn. 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 are required to trigger flowering and viable seed production in many native species. Recent evidence suggests that the frequency of fire in flatwoods communities 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 rather than waiting until the following summer.

Pine stands with higher 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.

4.3.12: Red-Cockaded Woodpecker

Current land management actions in actively managed natural communities that include mowing or mechanical removal of excess vegetation, removal of exotic vegetation,

and prescribed fire on a 2-3 year return interval will maintain and enhance habitat conditions for this species. During land management activities, protect active and inactive cavity trees as well as large, old pines that are potential cavity trees. Potentially suitable trees have ≥ 13 inches (25.4 cm) dbh and flat tops.

As HH/BCWMA and TNRWMA have active red-cockaded woodpecker clusters and participate in federally regulated translocation, managers will follow management guidelines found at [FWC Red-Cockaded Woodpecker Management Plan](#) and [USFWS Red-Cockaded Woodpecker Recovery Plan](#), especially sections 3 (Management Techniques) and 8 (Management Guidelines).

4.3.13: Short-Tailed Hawk

Short-tailed hawks exhibit high nest site fidelity, and historic nest areas are often used for multiple years, even if not active every year. Nests of this species are difficult to locate and monitor. If nest sites are located, protective action should be taken if/when nests are known to be active. Protect known nesting sites from disturbance by minimizing any management activities above normal baseline activities within a 330-foot buffer around the nest during the nesting season. Avoid heavy alteration of the nesting location and protect trees near the nest to preserve the integrity of the nest area. Protect potential future nest trees by retaining the largest, oldest trees on the landscape during land management activities.

4.3.14: Southern Bald Eagle

State and federal law requires protection of bald eagles, including avoiding disturbance of nesting eagles. Managers will consider the management guidelines in the [state management plan](#) and follow them when planning activities. 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 are detected via the survey. It is undesirable to have unnaturally dense stands around eagle nests. Continue to manage stands in which eagle nests occur, but use proper planning to 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.

4.3.15: Wading Birds

It is possible that ongoing 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. Minimizing any management activities above existing conditions within 330 feet of the colonies during nesting season will ensure adequate protection of these resources. Additionally, plan any mechanical and/or chemical control of aquatic vegetation at a time that avoids disturbance to the colony, and use methods that do not damage the plants in which wading birds construct their nests.

4.3.16: Florida Black Bear

Bears require large areas of dense vegetation for escape and denning cover. They also require a mosaic of dense and edge habitat, in both uplands and wetlands, which provides seasonally abundant forage. Efforts to restore and maintain natural communities on both WMAs will result in a more open landscape with reduced tree density and lower shrub height. Efforts to restore natural communities in pasture and abandoned agricultural fields will increase cover. Non-actively managed natural communities and the number and interspersions of wetland habitats will ensure these WMAs always provide escape and potential denning cover. During the planning of land management activities on these WMAs, give consideration to promoting and protecting travel corridors for bears within the WMA and across boundaries to other managed areas.

Should denning ever be documented on either WMA, limit the use of mechanical and prescribed fire activities during the denning season (mid-December-mid-April) at known dens. Preserve connectivity between cypress heads, depressional wetlands, and the hardwood swamp to allow bears to move across the area with appropriate cover.

4.3.17: 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 dense palmetto cover in some MUs will benefit this species by enhancing conditions for food producing species such as runner oak (*Quercus pumila*) and dwarf live oak (*Q. minima*), and providing the open conditions the species prefers. As fox squirrels require an oak component, some oaks should be retained in appropriate sites (e.g., fire shadows) during natural community restoration. Ideally, a variety of oak species in a range of age classes should be retained, but not to the extent this interferes with other species needs and natural community management.

Section 5: Species Management Opportunities

The focal species approach taken here represents a science-based approach to ecosystem management. Though this method relies on a suite of individual species, land management actions focused on these species directly benefit associated species. For some species, land management actions alone are insufficient in aiding recovery. These include species that are not present on a site, have limited dispersal capabilities, or are unlikely to occupy a site without reintroduction. Additionally, species that are currently present but occur at low densities, have low reproduction potential, or have other limitations that inhibit recovery, may require species-specific management. This section provides species management recommendations ([Section 5.1](#)) as well as monitoring recommendations ([Section 5.2](#)) to assess species response to land management and to determine the need for additional species management. [Section 5.3](#) identifies research necessary to guide future management.

5.1: Species Management

Species management as used here refers to non-monitoring actions taken for a specific species. It can include actions such as translocation, restocking, installing artificial cavities, etc. [Section 5.2](#) covers monitoring related actions, including banding or tagging. [Section 2](#) and [Section 4](#) provide information on land management actions, such as prescribed fire or mechanical treatments.

5.1.1: Red-Cockaded Woodpecker Translocation and Artificial Cavity Installation

Translocation efforts, coupled with continuing habitat improvement on both HH/BCWMA and TNRWMA, are vital to increasing the local red-cockaded woodpecker population. These WMAs participate in the Southern Range Translocation Cooperative and are currently a recipient site for translocations. Continuation of the translocation efforts is critical to the long-term persistence of the larger Three Lakes red-cockaded woodpecker metapopulation. To increase the local red-cockaded woodpecker population, it is necessary to supplement existing habitat with artificial cavities. Artificial cavities, both inserts and drilled, can be used to increase the number of suitable cavities within a cluster, or to create recruitment clusters in areas where managers would like to encourage population growth. Recruitment clusters are critical to support natural population growth, and guidelines require 2 recruitment clusters be available for each pair of translocated red-cockaded woodpeckers. Efforts have been underway since 2005 to install the artificial cavities that are required to be eligible for translocation. These artificial cavities also increase available habitat for resident bird and provide opportunities for fledged birds to create new active clusters. Managers will follow the USFWS species management guidelines ([Section 4.3.12](#)) and FWC guidelines found at [FWC red-cockaded woodpecker Management Plan](#).

5.2: Species Monitoring

Monitoring is critical to evaluating the impact of the management actions described in this Strategy. While we are unable to monitor all of the focal species on HH/BCWMA and TNRWMA, 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 6.5](#)).

This section provides the list of monitoring actions recommended for the area, and provides the purpose for the monitoring. The FWC is in the process of standardizing monitoring protocols for a number of these species. Approved protocols are available at [Monitoring Protocol Section of the WCPR SharePoint Site](#). When protocols are finalized, they will be implemented in accordance with the timeframe described in this Strategy.

5.2.1: Gopher Frog Monitoring

The purpose of gopher frog monitoring is to verify where the species breeds on either WMA and to track the use of breeding ponds over time. Dip-net surveys or call surveys will be completed following a WHM standard protocol. Because the gopher frog is an opportunistic breeder that responds quickly to heavy rains, surveys should occur around potential wetlands after major rain events and during late winter to early spring.

5.2.2: Gopher Tortoise Monitoring

No assessment of the status and distribution of tortoises has been completed for either HH/BCWMA or TNRWMA. Therefore, it would be beneficial to conduct an area-wide survey to establish a baseline using a standard monitoring protocol. The purpose of gopher tortoise monitoring is to evaluate the population trend over time. This trend is based on the number of burrows, and is not considered an actual population or density estimate. To convert the burrow density into a tortoise density would require determining the area-specific occupancy rate of burrows on the area during the survey. If funding is available to support the additional burrow scoping needed to determine occupancy, area staff should consider incorporating scoping into the burrow-only monitoring. To evaluate response over time, the survey should be repeated at least every 10 years, though a 5-year interval is preferable. The completion of these surveys is dependent on outside resources (i.e., funding for a contracted survey); without such funding, these surveys cannot be accomplished on HH/BCWMA and TNRWMA. The FWC is working with the USFWS and other land managers throughout the range of the gopher tortoise in an effort to establish a standard distance sampling protocol for use throughout the range of the species. As such, gopher tortoise monitoring should not occur on these WMAs until this formal protocol is agreed upon, or a determination is made that a standard protocol is not forthcoming.

Gopher Tortoise Recipient Site Monitoring - Within the Gopher Tortoise Recipient Site SMA ([Section 4.1.3](#)), either area staff or consultants will conduct burrow surveys every 3 years for the first 15 years following relocation (up until 2030). Surveyors will randomly- space 6, 1-acre transects over all potential habitat within the recipient site to provide at least 15% coverage of gopher tortoise habitat. Maximum dimensions for the individual transect are 250-meters by 16-meters, and should be oriented to allow for 100% detection of burrows within the transect. One or more surveyors will conduct the surveys, and they will space themselves evenly across the transect to provide for greatest detection. When a burrow is encountered while walking the transect, surveyors will mark the burrow with flagging tape, record the GPS coordinates of the burrow, and identify the level of gopher tortoise activity (potentially occupied or abandoned) based upon visual cues described in the [Gopher Tortoise Permitting Guidelines](#), Appendix 4.

After each survey repetition, surveyors will calculate the average tortoise density ($[(\text{Total Potentially Occupied Burrows} / \text{Total Acres within Survey Area}) \times 0.50]$), the estimated population size within the site ($\text{Tortoise Density} \times \text{Total Acres within Recipient Site}$) for that given year. The raw data, map with the burrow locations, tortoise density, and estimated population size will be provided to the Gopher Tortoise Permit Coordinator ([Section 6.1.1](#))

following each survey. After 2030, area staff can revisit the methods for surveying gopher tortoises on the recipient site to include the most up-to-date protocol authorized in the Guidelines, and conduct surveys every 5 years until 2040. After 2040, monitoring can be extended to every 10 years.

Within these burrow survey transects, area staff or consultants are also required to conduct vegetation monitoring every 3 years for the first 15 years following relocation (until 2030). Vegetation sampling will occur at 30% of the burrow survey transects (2 transects) and should be selected based on representative habitat condition. The beginning and end of the transect will be recorded on a GPS with sub-meter accuracy and staff will mark the location with either a T-post or rebar pole. The selected transect will have 4 vegetation monitoring stations located at the 0-, 75-, 150, and 225-meter point along the burrow survey transect. During vegetation surveys, surveyors will record canopy cover, shrub cover, and herbaceous ground cover for each point, as detailed in the [Gopher Tortoise Permitting Guidelines](#). Photo stations will be established at each sampling point to collect qualitative photographic habitat data during each survey year. The specific steps for conducting this sampling are found in Appendix 7 of the [Gopher Tortoise Permitting Guidelines](#).

Either area staff or consultants will draft a report after each sampling event. This report will include a brief description of the location, size, ownership, authorized agent and permit number of the property; the quantitative vegetation survey; a habitat management summary; a written narrative of the qualitative vegetation assessment; recent aerial images of the site; the photographic station points; and a transect map showing the vegetation points.

Area staff or consultants will submit reports to the Gopher Tortoise Permit Coordinator ([Section 6.1.1](#)) no later than 90 days following survey completion. This report will be included with the above tortoise report for the first 15 years. After 2030, reports do not need to include the quantitative vegetation survey and vegetation transect maps. After 2040, reports do not need to include the tortoise survey transects and GPS coordinates. Area staff or consultants will submit these reports to the Gopher Tortoise Permit Coordinator to ensure appropriate permitting guidelines have been met for the recipient site ([Section 6.1.1](#)).

5.2.3: Avian Spring Call Count Survey

The purpose of monitoring the Bachman's sparrow and brown-headed nuthatch is to establish a baseline measure of relative abundance (% of occupied points) and then to track this measure of relative abundance over time. Because these species are management responsive, they are good indicators of management success. Surveys will use spring point counts and a protocol currently being developed that includes the use of callback tapes to maximize detectability. On both WMAs, these avian surveys should occur annually, though if resources are limited they can be conducted every other year (or every 3 years) after the initial baseline survey. If resources are very limited, area staff could consider using a local volunteer group (like the Kissimmee Audubon) or other FWC staff (e.g., SCP section) to complete these surveys.

5.2.4: Northern Bobwhite Fall Covey Counts

The purpose of monitoring bobwhites on these WMAs is to determine an annual estimate of density. Staff use fall covey counts to estimate northern bobwhite population size

prior to the hunting season. This monitoring should continue as it provides an estimate of density, in the form of 1 bird per every X acres. As a management-responsive species, monitoring of northern bobwhite will help staff determine the effectiveness of their prescribed fire program and other management activities. Further, staff will compare harvest data to population data to determine if harvest levels are within levels deemed sustainable. Monitoring results should be shared with FWC's Small Game Program Coordinator ([Section 6.1.2](#)).

5.2.5: Red-Cockaded Woodpecker Monitoring

Ongoing monitoring efforts include pre-nesting season cluster and cavities status checks; nest checks and chick banding; fledge checks; and monitoring of banded birds. These monitoring efforts document translocation success, number of potential breeding groups, active clusters, group size, active trees and cavities, new cavity trees and clusters, nest success, and fledgling success. Staff uses these metrics to determine population size and trend, and to fulfill reporting requirements required to remain eligible for translocation. Staff will continue monitoring in accordance with USFWS guidelines ([USFWS red-cockaded woodpecker Recovery Plan](#), especially sections 3A and 8 C & D).

5.2.6: Opportunistic Monitoring

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, data will be compatible with other opportunistic observations. Staff will document opportunistic sightings by recording information that includes the species name, location (approximate coordinates or appropriate MU), number of individuals, behavior, and habitat type. Monitoring data will be made available to cooperating agencies, and organizations such as FNAI ([Section 6.5](#)).

Record encounters with or sign of the following focal species:

- Swallow-tailed kite (aggregations of 3 or more birds on regular basis in one area during spring, and any nesting activity)
- Burrowing owl
- Cooper's hawk (nesting activity only)
- Crested caracara (juveniles, nesting activity and banded individuals only)
- Florida black bear
- Florida grasshopper sparrow
- Florida panther
- Florida pine snake
- Florida sandhill crane (juveniles and nesting activity only)
- Florida mottled duck (juveniles and nesting activity only)
- Limpkin (juveniles and nesting activity only)
- Sherman's fox squirrel
- Short-tailed hawk (individuals and nesting activity)
- Snail kite (nesting activity only)
- Southern bald eagle (nesting activity only)

- Wading birds (nesting activity only)
- 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 for a given species. 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 HH/BCWMA or TNRWMA.

Section 6: Intra/Inter Agency Coordination

Throughout the WCPR process, there were many recommendations regarding possible management strategies for focal species. WHM staff can handle most proposed management actions; however, coordination with other sections in FWC or with other agencies is sometimes necessary or more efficient. This section identifies cases in which coordination is necessary outside of WHM, 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 this Strategy is drafted. As positions experience turnover, when in doubt, contact the current Section Leader or supervisor to determine the appropriate contact.

6.1: Florida Fish & Wildlife Conservation Commission (FWC)

6.1.1: Species Conservation Planning Section (SCP)

Monitoring animal populations on a WMA/WEA gives managers a way to gauge population response to management. If this information is not shared with others, valuable data that useful in assessing statewide conservation efforts often is lost or unused. Therefore, WHM will share monitoring data with the appropriate taxa coordinators, and with program coordinators for species that have formal conservation initiatives or management programs. The regional SCP biologist is a good source of information on the regional status of non-game species. Additionally, the Endangered Species Act [Section 6 Cooperative Agreement](#) between the FWC and the USFWS provides the authorization for FWC staff to handle federally listed wildlife. However, staff must be in compliance with the terms and conditions of the Agreement, which includes proper reporting of actions with federally listed wildlife. Staff will coordinate with FWC's Endangered Species Coordinator to meet the reporting requirements. In addition, any reports from the Gopher Tortoise Recipient Site SMA management and monitoring (see [Section 4.1.3](#) and [Section 5.2.2](#)) should be sent to the SCP gopher tortoise conservation program. Please note some contacts will also be covered under [Section 6.1.3](#); FWRI, and [Section 6.1.6](#); Florida's Wildlife Legacy Initiative.

Contacts:

Brad Gruver, Species Conservation Planning Section Leader: (850) 488-3831
Craig Faulhaber, Avian Conservation Coordinator: (352) 732-1225

Terry Doonan, Mammal Conservation Coordinator: (386) 758-0525
Brooke Talley, Reptile and Amphibian Conservation Coordinator: (850) 488-3831 David Cook, Invertebrate Conservation Coordinator: (850) 921-1021
Alex Kropp, Northeast Regional SCP Biologist: (352) 732-1225
Deborah Burr, Gopher Tortoise Conservation Program Coordinator: (850) 921-1019 Richard McCann, Gopher Tortoise Permitting Coordinator (850) 921-1028
Eric Seckinger, Northwest and North Central Gopher Tortoise Conservation Biologist (850) 921-1029
Rachel King, South Gopher Tortoise Conservation Biologist (561) 882-5714 Michelle Vandeventer, Bald Eagle Management Plan Coordinator: (941) 894-6675

6.1.2: Hunting and Game Management (HGM)

As the FWC has a statewide quail strategy, information collected on northern bobwhite should be shared with the FWC Quail Biologist. Staff should stay informed about northern bobwhite monitoring protocol. Information on the Florida mottled duck can be obtained from the waterfowl staff within the Waterfowl and Small Game Management Program. Questions pertaining to possible changes to hunting regulations for northern bobwhite should be directed to the Regional Public Hunting Areas Coordinator.

Contacts:

Paul Schulz, Game Species Management Section Leader: (850) 488-3831 Greg Hagan, Small Game Program Coordinator: (850) 488-3831
Jen Williams, Regional Public Hunting Areas Biologist, (352) 620-7349

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 through the FWC bald eagle database. Area staff will cooperate with Kevin Enge on herpetofauna monitoring and report documentation of these species to FWRI. The research administrator oversees the FWC's migratory bird scientific collection permit. Report handling of migratory birds covered by the permit to the research administrator in January of each year.

Contacts:

Robin Boughton, Section Leader: (352) 334-4218
Andrew Cox, Avian Research Administrator: (352) 334-4241
Janell Brush, Avian Research Biologist (bald eagle): (352) 334-4202 Karl Miller, Avian Biological Administrator: (352) 334-4215
Amy Schwarzer, Avian Research Biologist (wading birds): (352) 334-4201
Jeff Gore, Mammalian Research Administrator (southeastern bat): (850) 767-3624 Anna Farmer, Reptile and Amphibian Research Administrator: (352) 334-4216 Kevin Enge, Associate Research Scientist (gopher frog): (352) 334-4209

6.1.4: Aquatic Habitat Restoration/ Enhancement Subsection (AHREs)

A number of focal and imperiled species on these WMAs depend on aquatic ecosystems to meet their life requirements. Area staff should maintain contact with AHREs when conducting any hydrological assessments. Additionally, staff from AHREs will be helpful in the development of the enhancement or restoration SMA (in concert with SJRWMD and other agencies) for Bull Creek.

Contacts:

Steve Rockwood, Section Leader: (850) 617-9471

Bill Caton, Section Leader: (850) 617-9428

6.1.5: Office of Conservation Planning Services (CPS)

Private lands biologists within FWC's Office of CPS work to provide technical and financial assistance to landowners interested in managing their properties in a manner compatible with the needs of wildlife. These biologists are able to write management plans for landowners and enroll them in cost-share programs that offset some of the financial costs associated with land management. If private landowners near HH/BCWMA or TNRWMA express an interest in managing of their lands for wildlife, CPS biologists should be contacted and provided the landowner's information.

Contacts:

Scott Sanders, Office Director: (850) 488-3831

Mark Asleson, Regional CPS Coordinator: (352) 620-7355 Macky

Thurman, CPS Biologist: (352) 732-1225

6.1.6: Florida's Wildlife Legacy Initiative (FWLI)

Monitoring animal populations on a WMA gives managers a way to gauge population response to management. If this information is not shared with others, valuable data that useful in assessing statewide conservation efforts often is lost or unused. FWRI can assist in identifying potential partners for collaboration of monitoring and management efforts. FWLI also might be a source of funding via the State Wildlife Grants program; therefore, regular communication with this section will be important.

Contacts:

Brian Branciforte, Program Coordinator: (850) 488-3831 Heather

Hitt, Regional Legacy Biologist: (772) 469-4267

6.1.7: Imperiled Species Management Section (ISM)

The Imperiled Species Management Section is responsible for the implementation and evaluation of imperiled species management and recovery plans. While these WMAs are not critically important for the conservation of Florida black bears or Florida panthers, staff should contact staff with ISM with questions about these species.

Contacts:

Carol Knox, Section Leader: (850) 922-4330 Darrell Land,
Panther Team Leader: (239) 417-6352
Dave Telesco, Biological Administrator (bears): (850) 922-4330 Mike
Orlando, Biological Scientist (bears): (386) 965-2464

6.2: Saint Johns River Water Management District (SJRWMD)

The SJRWMD is responsible for water manipulation practices that affect the Bull Creek system, and would be involved in any restoration of the creek. Additionally, SJRWMD is responsible for management of the adjacent Three Forks Marsh Conservation Area.

Contacts:

JB Miller, Senior Land Resource Planner: (386) 329-4381 Doug
Voltolina, Land Manager: (321) 676-6614

6.3: Florida Forest Service (FFS)

The FFS provides authorizations for prescribed burning, and will provide assistance with escaped fires. FFS can provide assistance with timber management including administration of contracts for thinning or reforestation operations. WMA staff should continue to coordinate prescribed fire and timber management activities with FFS.

Contacts:

Tom Donahoe, Forest Area Supervisor; (407) 892-3024

6.4: 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; gkent@arciinst.org

6.5: 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. As such, WHM will share information about rare and listed species occurrences on HH/BCWMA and TNRWMA with FNAI to ensure this information is included in their database. Additionally,

FWC has a contract that allows FNAI to provide plant and animal surveys if the need exists and resources are available.

Contacts:

Dan Hipes, Chief Scientist: (850) 224-8207

6.6: Southern Range Translocation Cooperative (SRTC)

The SRTC was created in 1998 to coordinate the translocation of red-cockaded woodpeckers from secure (e.g., source) populations to sites where local populations need to be increased. Area staff should be encouraged to attend the annual meeting of the SRTC where decisions are made about the number of individual woodpeckers available to the local BC3N population.

Contacts:

Will McDearman, USFWS RCW Recovery Coordinator; (601) 321-1124

Section 7: Beyond the Boundaries Considerations

There is enough potential habitat on HH/BCWMA and TNRWMA that, under an appropriate management regime, it is possible to support many of the focal species. With the continuation of funding for management, these WMAs can support viable populations of several species, including northern bobwhites, Bachman's sparrows, brown-headed nuthatches, and gopher tortoises. Wide-ranging species such as crested caracara, Cooper's hawks, bald eagles, swallow-tailed kites, and wading birds will continue to exist on these WMAs as long as regional conditions are conducive to their persistence. While these WMAs can play a role in supporting the regional population of these wide-ranging species, ultimately, the continued existence of these species on the WMAs is dependent on what happens to the regional populations.

The current management boundaries for these WMAs do not include all important habitat for focal species. The FWC originally identified Strategic Habitat Conservation Areas (SHCAs) in the [Closing the Gaps in Florida's Wildlife Habitat Conservation System report](#) (Cox et al. 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. New SHCAs have been identified in recent FWC efforts to update the Closing the Gaps entitled "[Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas](#)".

This report identified SHCA within 3 miles of these WMAS for the burrowing owl, swallow-tailed kite, short-tailed hawk, snail kite, Cooper's hawk, Florida black bear, and Florida panther. Although it is unlikely Florida will acquire all property identified in SHCAs, property acquisition and actions that encourage land use and management that is compatible with the needs of the WMAs' focal species should be a priority in the area. One tract, the Roberson parcel, is currently for sale (as of Spring 2012). Bordered on three sides by TNRWMA's southwest corner, acquisition of this property would provide additional acreage to support most of the areas' focal species including, but not

limited to, red cockaded woodpecker, Bachman's sparrow, brown-headed nuthatch, and gopher tortoise.

While the current conditions and management of HH/BCWMA and TNRWMA and neighboring lands provide an opportunity to further the conservation of many focal and imperiled species, significant changes in management or land use beyond the boundaries may have a significant impact on some species. As many of the area's species are dependent upon fire-maintained habitat, any change beyond the boundaries that impedes staff's ability to conduct prescribed fire would be detrimental to the persistence of species such as northern bobwhite, red-cockaded woodpecker, and gopher tortoise. Much of the land surrounding both WMAs is used for agriculture, but many of these landowners are involved in private lands conservation programs. Staff within FWC's Office of Conservation Planning Service ([Section 6.1.5](#)) should be encouraged these landowners to continue managing their agricultural operations in a manner that is compatible with the needs of wildlife. If these lands are cleared for development due to an expanding Orlando and Kissimmee/St. Cloud population, species that require large home ranges, or that are dependent on dispersal for maintaining viable populations, will be negatively affected.

Document Map

Species	Species Assessment	Land management actions	Species management actions	Species monitoring	Research needs	Intra/inter agency coordination
Gopher frog	3.2.1	4.3.1		5.2.1		6.1.3
Eastern indigo snake	3.2.2	4.3.2		5.2.6		6.1.3 ; 6.1.5
Florida pine snake	3.2.3	4.3.2		5.2.6		6.1.5
Gopher tortoise	3.2.4	4.1.3 , 4.3.3		5.2.2		6.1.1
American swallow-tailed kite	3.2.5	4.3.4		5.2.6		6.4
Bachman’s sparrow	3.2.6	4.3.5		5.2.3		
Brown-headed nuthatch	3.2.7	4.3.6		5.2.3		
Burrowing owl	3.2.8	4.3.7		5.2.6		
Cooper’s hawk	3.2.9	4.3.8		5.2.6		
Crested caracara	3.2.10	4.3.9		5.2.6		6.1.4
Florida grasshopper sparrow	3.2.22			5.2.6		
Florida mottled duck	3.2.11			5.2.6		
Florida sandhill crane	3.2.12	4.3.10		5.2.6		6.5
Limpkin	3.2.13			5.2.6		6.2 ; 6.5
Northern bobwhite	3.2.14	4.3.11		5.2.4		6.1.2
Red-cockaded woodpecker	3.2.15	4.3.12	5.1.1	5.2.5		
Short-tailed hawk	3.2.16	4.3.13		5.2.6		6.4 ; 6.5
Snail kite	3.2.22			5.2.6		
Southern bald eagle	3.2.17	4.3.14		5.2.6		
Wading birds	3.2.18	4.3.15		5.2.6		
Florida black bear	3.2.19	4.3.16		5.2.6		6.1.3
Florida panther	3.2.20			5.2.6		6.1.7
Sherman’s fox squirrel	3.2.21	4.3.17		5.2.6		6.1.5

Appendix I

This Appendix contains the original text from [Section 3.2.4](#) as approved in the original Strategy dated February 2012 (prior to the revision on 5/31/2015).

3.2.4 Gopher Tortoise

Because existing management actions will continue to maintain and or enhance potential habitat for tortoises, no SMA is required.

12.14 Timber Assessment



TIMBER ASSESSMENT

HERKY HUFFMAN/BULL CREEK WILDLIFE MANAGEMET AREA

PREPARED BY:
MICHAEL EDWARDS, SENIOR FORESTER
OTHER PUBLIC LANDS REGION 3 & 4
FLORIDA FOREST SERVICE

December 16, 2016

PURPOSE

This document is intended to fulfill the timber assessment requirement for Herky Huffman/Bull Creek Wildlife Management Area (HHBCWMA) as required by Section 1, 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

LOCATION

The HHBCWMA, encompassing approximately 23,646 acres, lies in the eastern portion of Osceola County, and is a part of the Upper St. Johns River Basin system. The property is located approximately eight miles east of Holopaw and approximately 30 miles west of Melbourne. HHBCWMA is bordered by private lands to the north; the Jane Green Creek and Kempfer conservation easements to the east; private lands to the south; the Broussard and Kaschai conservation easements, and Triple N Ranch WMA to the west.

HISTORY

Most HHBCWMA property was purchased in 1967 by the Central and Southern Florida Flood Control District and transferred to the Saint John's Water Management District (SJRWMD) in 1977. In 1970, the area was leased to the Florida Game and Fresh Water Fish Commission (now the FWC) to be managed as a wildlife management area (WMA). For management purposes, approximately 1,279 acres of the Triple N Ranch WMA were established as part of HHBCWMA in 1996. These lands were originally acquired using Save Our Rivers funds partly appropriated to the SJRWMD from Preservation 2000 Land Acquisition Program (P-2000), and funds appropriated to FWC as its share of the P-2000 Inholdings and Additions Acquisition Program funding provided from each P-2000 bond series. In 2001, additional lands (161 acres) were added to HHBCWMA through the Osceola Pines Savannah Florida Forever conservation acquisition project.

PAST LAND MANAGEMENT

Between 5,000 and 3,000 B.C. the Timucua Indians used the Bull Creek area for hunting and left two non-permanent hunting camps on HHBCWMA. Exploitation of timber resources and agricultural development were the main factors that opened the area to settlers. The HHBCWMA represents a portion of George W. Hopkins original 1902 tract. Timber harvesting operations in the Bull Creek area began in 1912 and was concluded by 1928. No active reforestation efforts were made after the timber harvests, leaving large portions of the property without trees.



CURRENT LAND MANAGEMENT

GAME AND NON-GAME SPECIES RECREATION

The FWC and SJRWMD continue to offer a suite of hunting opportunities. Game species management on HHBCWMA is designed to perpetuate populations capable of providing a quality hunting experience. Other public use on HHBCWMA includes: wildlife viewing, hiking, picnicking, photography, paddling, horseback riding, bicycling, camping, as well as other nature-based activities. FWC also manages for several rare, threatened and endangered species like the red-cockaded woodpecker (*Picoides borealis*) RCW.

TIMBER MANAGEMENT

SJRWMD conducted a timber thinning of slash pine along the eastern boundary on a portion of the Army Corp of Engineers' Levee 73 in 2015.

CURRENT ADJACENT LAND USE

Much of the private rural lands in the regional landscape are composed of working agricultural operations with cattle ranching, citrus and sod farming being the more common commercial agricultural practices in the area at present. Others include timber harvesting and a cypress mulching operation.

HYDROLOGY

Bull Creek is in the eastern one-third of the property, and flows from the south to the north.

Approximately 75 percent of HHBCWMA is drained through Bull Creek and its secondary streams and sloughs. The northern part of the area is drained by Crabgrass Creek, which flows from the west to the east and then south to join Bull Creek. Water control structures S-161 and S-161A are located downstream of the confluence of Bull and Crabgrass creeks. These structures are located within Army Corp of Engineers' Levee 73. This confluence marks the formation of Jane Green Creek, which flows easterly to the St. Johns River.

Billy Lake is in the south-central portion of the area, approximately 0.2 miles north of the southern boundary of HHBCWMA. While a relatively small open water body (~3 acres), under normal conditions Billy Lake typically holds water year-round. In cooperation with the SJRWMD and the Army Corp of Engineers, natural water regimes will be re-established to the extent feasible and appropriate. This is consistent with the primary purpose for the acquisition of the land and relates directly to the water quantity and quality aspects of the ecosystem. Pursuant to the results of a hydrological assessment, and where feasible, the FWC and the SJRWMD will coordinate work projects to plug existing ditches at Donovan's ditch (western boundary) and others as appropriate.

The water control structures present on the eastern boundary have the potential to affect the wet flatwoods and mesic flatwoods communities. Currently they can artificially make these communities wetter than what is normal historically and alter the presence of native plant species, growth of the pine overstory, and alter natural fire regimes. When hydrological restoration takes place there will be a reverse effect on these communities. The hydrology on this property will directly affect timber management and restoration efforts. Considerations should be made when planning timber sales and restoration projects in the communities surrounding Billy Lake, creeks, and water control structures.

PRESCRIBED BURN UNITS

Local resource managers have designated Burn Units on HHBCWMA. There are 88 Burn Units (BUs) and range in size from 10 to 528 acres. FWC records from 2011 to 2015 show that 58% of BU have had growing season burns and 42% of BU have had a dormant season burn. The BUs are also used by the resource managers for other land management purposes and will be referred to later in the *Timber Assessment* as Management Units (MUs) when identifying timber management recommendations.



GOALS and OBJECTIVES

A field visit and discussion with the area Biologist was conducted in May 2016. Also document reviews of the current HHBCWMA Management Plan and 2016 Objective Based Vegetation Management (OBVM) Report were completed. The background information has resulted in the identification of seven goals and eleven objectives. It is feasible to manage timber resources for conservation with the possibility for revenue generation while meeting FWC's goals and objectives described below.

GOALS

Forest Resource Management Goal:

- Manage timber resources for resource conservation and wildlife habitat improvement.

Habitat Restoration and Improvement Goal:

- Improve extant habitat and restore disturbed areas.

Red-cockaded Woodpecker Habitat Maintenance, Enhancement, or Restoration, Goal:

- Maintain, improve, or restore imperiled species populations and habitats.

Other Game and Non-Game Wildlife Species Goal:

- Maintain, improve, or restore game and non-game species populations and habitats.

Exotic and Invasive Species Maintenance and Control Goal:

- Remove exotic and invasive plants and animals and conduct needed maintenance and control activities.

Capital Facilities and Infrastructure Goal:

- Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

Hydrological Preservation and Restoration Goal:

- Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the restored condition.

OBJECTIVES

Forest Resource Management Objective:

- Cooperate with the FFS or a private forestry consultant, to complete a Timber Assessment.

Habitat Restoration and Improvement Objectives:

- Continue to conduct prescribed burning on 6,000 acres of fire-adapted communities per year.
- Pursuant to the OBVM program, continue to conduct habitat and natural community improvement (i.e., mechanical/chemical treatments, hardwood removal, and timber stand improvement) on 500 acres per year.

Red-cockaded Woodpecker Habitat Maintenance, Enhancement, or Restoration, Objectives:

- Conduct prescribed fires on a regular or recurring basis.
- Manage pine forest stands so that they provide suitable foraging (age > 30 years) or nesting/roosting habitat (age > 60 years).
- Provide a minimum of 75 acres of foraging habitat for each territory.
- Timber harvesting allowed (Aug. through the end of Mar.) in areas containing red-cockaded woodpeckers.

Other Game and Non-Game Wildlife Species Objectives:

- Conduct annual surveys and data collection on game and non-game wildlife species.

Exotic and Invasive Species Maintenance and Control Objective:

- Continue to annually treat at least 25 acres of EPPC Category I and Category II invasive exotic plant species in areas documented or discovered to have exotic invasive plant species occurrences; cooperate and coordinate treatment applications with the SJRWMD Invasive Plant Management Program.



Capital Facilities and Infrastructure Objective:

- Maintain facilities, 16.8 miles of roads, and 19.5 miles of trails existing.

Hydrological Preservation and Restoration Objectives:

- Maintain and enhance natural hydrological functions, install, and maintain low-water crossings and culverts as appropriate.

EXISTING CONDITIONS

ECOLOGICAL COMMUNITIES

Florida Natural Areas Inventory (FNAI) mapped 13 historic and 17 current natural community types on HHBCWMA. 12 communities, covering 66% of the total acres on HHBCWMA will be addressed in this *Timber Assessment*.

- Mesic Flatwoods (11,805.40 acres)
- Wet Flatwoods (2,058.60 acres)
- Scrubby Flatwoods (959.10 acres)
- Wet Prairie (577.20 acres)
- Dry Prairie (527.50 acres)
- Ruderal:
 - Agriculture (0.53 acres)
 - Abandoned field (8.92 acres)
 - Clearing/Regeneration (14.19 acres)
- Scrub (159.30 acres)
- Pasture-Improved (25.90 acres)
- Pine Plantation (8.80 acres)
- Sandhill (4.6 acres)
- Pasture-Semi-Improved (1.70 acres)

SOILS AND PRODUCTIVITY

The U. S. Department of Agriculture Natural Resource Conservation Service (NRCS) publishes soil series profiles and site index for pines. The following is a generalized summary of the most prevalent soils. The site index for each pine species is mentioned under each ecological community. Site Index (SI) refers to the average height of the dominant or dominant and codominant trees of a certain species in a stand at an index age usually 25, 50, or 100. The index age used in the Osceola County Soil Survey was 50.

MESIC FLATWOODS SOIL TYPES

# 6 BASINGER FINE SAND DEPRESSIONAL	0-2% SLOPE
#9 CASIA FINE SAND	0-2% SLOPE
#11 EAUGALLIE FINE SAND	0-2% SLOPE
# 16 IMMOKALEE FINE SAND	0-2% SLOPE
#17 KALIGA MUCK	LESS THAN 1 % SLOPE
#18 LOKOSEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE
#25 NITTAWA MUCK	0-2% SLOPE
#31 PITS	(BORROW PIT)
#32 PLACID FINE SAND	0-2% SLOPE



DEPRESSIONAL	
#34 POMELLO FINE SAND	0-5% SLOPE
#41 SATELLITE SAND	0-2% SLOPE
#42 SYMRNA FINE SAND	0-2% SLOPE

WET FLATWOODS SOIL TYPE

# 5 BASINGER FINE SAND	0-2% SLOPE
#10 DELRAY LOAMY FINE SAND, DEPRESSIONAL	0-2% SLOPE
#11 EAUGALLIE FINE SAND	0-2% SLOPE
#12 FLORIDANA FINE SAND, DEPRESSIONAL	0-2% SLOPE
#14 HOLOPAW FINE SAND	0-2% SLOPE
# 16 IMMOKALEE FINE SAND	0-2% SLOPE
#18 LOKOSEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE
#25 NITTAWA MUCK	0-2% SLOPE
#26 OLDSMAR FINE SAND	0-2% SLOPE
#27 ONA FINE SAND	LESS THAN 2% SLOPE
#29 PARKWOOD LOAMY FINE SAND, OCCASIONALLY FLOODED	0-2% SLOPE
#31 PITS	(BORROW PIT)
#32 PLACID FINE SAND DEPRESSIONAL	0-2% SLOPE
#38 RIVERA FINE SAND	LESS THAN 2% SLOPE
#40 SAMSULA MUCK	0-1% SLOPE
#42 SYMRNA FINE SAND	0-2% SLOPE

SCRUBBY FLATWOODS SOIL TYPES

#9 CASIA FINE SAND	0-2% SLOPE
# 16 IMMOKALEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE
# 24 NARCOOSSEE FINE SAND	0-2% SLOPE
#31 PITS	(BORROW PIT)
#34 POMELLO FINE SAND	0-5% SLOPE
#42 SYMRNA FINE SAND	0-2% SLOPE

WET PRAIRIE SOIL TYPES

# 5 BASINGER FINE SAND	0-2% SLOPE
# 6 BASINGER FINE SAND DEPRESSIONAL	0-2% SLOPE
#11 EAUGALLIE FINE SAND	0-2% SLOPE
#14 HOLOPAW FINE SAND	0-2% SLOPE
# 16 IMMOKALEE FINE SAND	0-2% SLOPE
#18 LOKOSEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE
#25 NITTAWA MUCK	0-2% SLOPE



#42 SYMRNA FINE SAND	0-2% SLOPE
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DRY PRAIRIE SOIL TYPES

# 5 BASINGER FINE SAND	0-2% SLOPE
#9 CASIA FINE SAND	0-2% SLOPE
# 16 IMMOKALEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE
#34 POMELLO FINE SAND	0-5% SLOPE

AGRICULTURE SOIL TYPE

# 24 NARCOOSSEE FINE SAND	0-2% SLOPE
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ABANDONED FIELD SOIL TYPES

# 16 IMMOKALEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE

CLEARING/REGENERATION SOIL TYPES

# 16 IMMOKALEE FINE SAND	0-2% SLOPE
#31 PTS	(BORROW PIT)
#40 SAMSULA MUCK	0-1% SLOPE

SCRUB SOIL TYPES

#9 CASIA FINE SAND	0-2% SLOPE
# 16 IMMOKALEE FINE SAND	0-2% SLOPE
#34 POMELLO FINE SAND	0-5% SLOPE
#41 SATELLITE SAND	0-2% SLOPE
#43 ST. LUCIE FINE SAND	0-5% SLOPE

PASTURE SEMI-IMPROVED SOIL TYPE

# 24 NARCOOSSEE FINE SAND	0-2% SLOPE
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PINE PLANTATION SOIL TYPES

# 16 IMMOKALEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE

SANDHILL SOIL TYPES

#9 CASIA FINE SAND	0-2% SLOPE
# 24 NARCOOSSEE FINE SAND	0-2% SLOPE

PASTURE -IMPROVED SOIL TYPES

# 6 BASINGER FINE SAND DEPRESSIONAL	0-2% SLOPE
# 16 IMMOKALEE FINE SAND	0-2% SLOPE
# 22 MYAKKA FINE SAND	0-2% SLOPE
# 24 NARCOOSSEE FINE SAND	0-2% SLOPE
#34 POMELLO FINE SAND	0-5% SLOPE



MESIC FLATWOODS (11,805.40 acres) MUs (1, 3-47, 49-54, 57, 58, 60, 63, 63-65, 67-74, 77-86, 88, 90, 101-108, 110-114, and 16162)

Mesic flatwoods constitute 50% of the total acreage on HHBCWMA. This community typically contains a sparse canopy of LLP or SP. Pine canopies are often very sparse when adjacent to scrubby flatwoods, scrub, and prairie communities and much denser when grading down slope towards hammock communities. HHBCWMA mesic flatwoods are natural, even aged stands or two aged. The dominant product class is chip n saw. The OBVM report showed two thirds of the mesic flatwoods (7,437.40 acres) have a basal area less than the desired 10-50 square feet basal area. The Site Index (SI) for slash pine (*Pinus elliottii*) SP on mesic flatwoods is 70-75. SI for longleaf pine (*Pinus palustris*) LLP is 60-65.

Shrubs are primarily represented by saw palmetto (*Serenoa repens*) but may also include coastalplain staggerbush (*Lyonia fruticosa*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), Atlantic St. John's wort (*Hypericum reductum*), gallberry (*Ilex glabra*), dwarf wax myrtle (*Myrica cerifera* var. *pumila*), dwarf live oak (*Quercus virginiana*), and shiny blueberry (*Vaccinium myrsinites*). Due to frequent prescribed fire applications, shrubs are commonly short and form a well-structured flatwoods habitat. Wiregrass (*Aristida stricta* var. *beyrichiana*) is the common herbaceous species observed in the mesic flatwoods community. Associated species are broomsedge (*Andropogon virginicus*), bluestem (*Andropogon* sp.), bottlebrush threeawn (*Aristida spiciformis*), witchgrass (*Dichanthelium* sp.), tall elephantsfoot (*Elephantopus elatus*), blackroot (*Pterocaulon pycnostachyum*), little bluestem (*Schizachyrium scoparium*), and lopsided indiagrass (*Sorghastrum secundum*). Vines were typically sparse to nonexistent in mesic flatwoods at HHBCWMA. The desired future condition of the herbaceous groundcover cover ($\geq 15\%$) needs improvement on 35% of the mesic flatwoods community (4,131.89 acres)

In the 1944 aerial photography scattered bare patches of sand can be observed, while trees are generally absent. This might be the result of stump removal for the turpentine industry of the early and middle 19th century. Some of the area classified as historic mesic flatwoods may have been historic dry prairie communities. Due to past fire history and applied roller chopping techniques dry prairie is often difficult to discern from mesic flatwoods. Roller chopped mesic flatwoods commonly has very low structured shrub layer that appears to be stunted and is very similar in structure to a dry prairie habitat. Areas of dry prairie that have not received sufficient prescribed fire have excessively tall shrubs and/or canopy pines. These areas are difficult to impossible to differentiate from historic flatwoods. Historic aerial photography is useful in the delineation of these two similar habitats, but may not show or represent true historic conditions.

Artificial regeneration (planting containerized LLP seedlings) may be needed where the BA is below the desired future conditions outlined in the OBVM. Some areas where RCW clusters and foraging habitat are located may need pine BA thinned and midstory hardwood stems removed. Some areas need ground cover restoration to increase the cover percentage of herbaceous plants. If prescribed fire isn't sufficient in increasing cover, then artificial methods like planting wiregrass plugs or seeding other native herbaceous plants could be used.

WET FLATWOODS (2,058.60 acres) MU (3, 5, 7, 11, 13-16, 18, 23, 26-28, 29, 31, 32, 39, 49-51, 54, 57, 64, 68, 70, 73, 86, 88, 90, 101, -102, 105, 107, 108, 110-112, and 114)

Wet flatwoods constitute 9% of the total acreage on HHBCWMA. Wet flatwoods occur in two unique forms on the property. The first subtype is generally in line with typical wet flatwoods landscape positioning, structure, and species composition. The second subtype of wet flatwoods at HHBCWMA occurs on low lying elevations that occur between floodplain systems and mesic flatwoods habitats. The wet flatwoods community is natural, even aged or two aged stands. Dominant product class is chip n saw. There was no OBVM report for this community. At a handful of locations in the cabbage palm flatwoods



subtype community a 10 BAI prism was used, BA of 80-120 square feet was recorded. The SI for slash pine (*Pinus elliottii*) SP on wet flatwoods is 70-75. SI for LLP is 60-65.

MOSAIC WET FLATWOODS SUBTYPE COMMUNITY

First wet flatwoods subtype community can be described as a mosaic of wet prairie interspersed with small mesic flatwoods islands that are dominated by saw palmetto and occasional pines. The mix of mesic flatwoods and wet prairie is often not easily represented in map form and is best lumped into a wet flatwoods classification. Typical wet flatwoods situations contain a sparse to moderately dense canopy of LLP. The subcanopy is often absent, but when present includes red maple (*Acer rubrum*), cabbage palm (*Sabal palmetto*), and pond cypress (*Taxodium ascendens*). Shrubs are often very sparse, but can be dense in fire excluded areas. Common shrubs include buttonbush, gallberry, fetterbush, wax myrtle, SP, cabbage palm, saw palmetto, roundpod St. John's wort (*Hypericum cistifolium*), and peelbark St. John's wort (*Hypericum fasciculatum*). Herbaceous species are often very diverse and the dominant species often includes bottlebrush threecawn, wiregrass, pineland daisy (*Chaptalia tomentosa*), pink sundew (*Drosera capillaris*), maidencane (*Panicum hemitomon*), shortbristle horned beaksedge (*Rhynchospora corniculata*), sugarcane plumegrass (*Saccharum giganteum*), and bog white violet (*Viola lanceolata*).

CABBAGE PALM FLATWOODS SUBTYPE COMMUNITY

The second subtype of wet flatwoods at HHBCWMA occurs on low lying elevations that occur between floodplain systems and mesic flatwoods habitats. LLP is replaced by SP in the canopy of this wet flatwoods variant which is referred to as a "cabbage palm flatwoods" (FNAI, 2010). These areas appear to receive infrequent floodwater inputs and commonly contain more organic soils than sandy flatwoods soils. Additional unnatural flooding events impact these habitats; caused by water manipulation devices located on the eastern side of the HHBCWMA. The results of such flooding limit species diversity and only allow for species that can persist after flooding events. The frequent presence of cabbage palm in this habitat also indicates less acidic and/or lime rich soils. Additional canopy species occurring in this variant of wet flatwoods include sweetgum (*Liquidambar styraciflua*), red maple, live oak (*Quercus virginiana*), and cabbage palm. Shrubs are generally sparse to moderately dense and kept in check by flooding impacts and prescribed fire applications. Common shrubs in the cabbage palm variant include common buttonbush (*Cephalanthus occidentalis*), common persimmon (*Diospyros virginiana*), dahoon, fetterbush, wax myrtle, coastalplain willow (*Salix caroliniana*), saw palmetto, roundpod St. John's wort, peelbark St. John's wort, St. Andrew's cross (*Hypericum hypericoides*), and gallberry. Herbaceous species are much less diverse than the more typical wet flatwoods situations. Common herbaceous species include blue maidencane, shortspike bluestem (*Andropogon brachystachyus*), bushy bluestem (*Andropogon glomeratus*), chalky bluestem (*Andropogon virginicus* var. *glaucus*), spadeleaf (*Centella asiatica*), sawgrass (*Cladium jamaicense*), slender flattop goldenrod (*Euthamia caroliniana*), clustered bushmint (*Hyptis alata*), maidencane, and Virginia chain fern (*Woodwardia virginica*). This community often occurs interspersed with mesic flatwoods that is dominated by slash pine and saw palmetto. Cabbage palm wet flatwoods and mesic flatwoods found in low lying areas adjacent to the floodplain communities of HHBCWMA are typically not distinguishable from one another on aerial photography. These communities are best classified as a mosaic of the two.

The cabbage palm flatwoods subtype community should be thinned from the present BA 80-120 square feet to a BA of 40-60 square feet. This will open the canopy and allow sunlight to reach the forest ground, allowing for greater diversity of ground cover species. During the thinning some of the cabbage palms in the midstory should be removed as well. This will allow for better control of prescribed fires and increase sunlight to the ground. There could be a market to sell cabbage palms. In certain areas of Florida landscape companies will buy them. The mosaic wet flatwoods subtype community had a more varied BA. Quick window cruise of this community show estimates anywhere from BA of 40-80 square feet. Where practical, areas with BA 50-80 square feet could be thinned to BA 40-60 square feet. The ground



cover in the mosaic wet flatwoods subtype community can be maintained and improved with prescribed fire. No artificial planting of ground cover is necessary. Control of any invasive exotics is suggested.

SCRUBBY FLATWOODS (959.10 acres) MUs (4, 18, 21 24, 29-31, 33, 38, 41, 44, 46, 47, 49, 53, 54, 57, 58, 70, 73, 78, 80-82, 84-86, 90, 101, 102, 104, 105, 107, 108, and 110-113)

Scrubby flatwoods constitute 4% of the total acreage on HHBCWMA. Scrubby flatwoods at HHBCWMA occurs in isolated islands and association with the mesic flatwoods and scrub communities on the property. Scrubby flatwoods contain scrub oaks, but differ from scrub by having a greater percent cover of saw palmetto and herbaceous groundcover species, and by typically having a canopy of LLP. Many areas of scrubby flatwoods on HHBCWMA have been identified as reference natural communities for Florida by FNAI for their exceptional open and low shrub structure and canopy age. HHBCWMA scrubby flatwoods are natural, even aged stands. The dominant product class is chip n saw. The OBVM report showed 70% of the scrubby flatwoods (671.37 acres) have a BA less than the desired 10-60 square feet. The SI for LLP on scrubby flatwoods is 60-65.

LLP pine is the dominant canopy species, while sand pine (*Pinus clausa*) SD, SP, and sand live oak are found much less frequently in the canopy layer. Tall shrubs are common and vary in densities from one stand to another. Common tall shrub species include tarflower (*Bejaria racemosa*), rusty staggerbush (*Lyonia ferruginea*), coastalplain staggerbush (*Lyonia fruticosa*), fetterbush, Chapman's oak (*Quercus chapmanii*), sand live oak, myrtle oak (*Quercus myrtifolia*), cabbage palm, saw palmetto, and deerberry (*Vaccinium stamineum*). The short shrub layer often contains the same species in addition to netted pawpaw (*Asimina reticulata*), dwarf huckleberry (*Gaylussacia dumosa*), Atlantic St. John's wort (*Hypericum reductum*), fourpetal St. John's wort (*Hypericum tetrapetalum*), gopher apple (*Licania michauxii*), dwarf wax myrtle, pricklypear (*Opuntia humifusa*), wild pennyroyal (*Ptiloblephis rigida*), dwarf live oak, winged sumac (*Rhus copallinum*), shiny blueberry (*Vaccinium myrsinites*), and Adam's needle (*Yucca filamentosa*). Herbaceous species are typically sparse, which is common for this community. Wiregrass is the dominant herbaceous species. Additional groundcover associates include arrowfeather threeawn (*Aristida purpurascens*), bottlebrush threeawn (*Aristida spiciformis*), wiregrass, coastalplain honeycomb-head (*Balduina angustifolia*), Ware's hairsedge (*Carex verrucosa*), coastalplain chaffhead (*Carphephorus corymbosus*), witchgrass (*Dichanthelium* sp.), tall elephantsfoot (*Elephantopus elatus*), wedge-leaved button-snakeroot (*Eryngium cuneifolium*), Elliott's milkpea (*Galactia elliotii*), blazing star (*Liatris* sp.), skyblue lupine (*Lupinus diffusus*), narrowleaf silkgrass (*Pityopsis graminifolia*), candyroot (*Polygala nana*), october flower (*Polygonella polygama*), largeflower jointweed (*Polygonella robusta*), rustweed (*Polypremum procumbens*), bracken fern (*Pteridium aquilinum*), blackroot (*Pterocaulon pycnostachyum*), sandyfield beaksedge (*Rhynchospora* sp.), little bluestem, sweet goldenrod (*Solidago odora*), lopsided indiagrass, queen's delight (*Stillingia sylvatica*), and Carolina yellow-eyed grass (*Xyris caroliniana*). The desired future condition of the herbaceous groundcover cover is 1-10%. Most (87% or 834.42 acres) of the scrubby flatwoods community meet this attribute.

Artificial regeneration (planting containerized LLP seedlings) may be needed where the BA is below the desired future conditions outlined in the OBVM. Some areas need ground cover restoration to increase the cover percentage of herbaceous plants. If prescribed fire isn't sufficient in increasing cover, then artificial methods like planting wiregrass plugs or seeding other native herbaceous plants could be used.

WET PRAIRIE (577.20 acres MUs (6, 7, 9, 10, 11, 16, 18-20, 22, 24, 25, 28, 30, 33-35, 47, 49, 50, 52, 54, 58, 60, 65, 68, 71 73, 78-80, 83, 86, 88, 102, 104, 110, and 16162)

Wet prairie constitutes 2% of the total acreage on HHBCWMA. The wet prairie typically lacks a canopy or contains only a few scattered LLP. In areas that have been disturbed, commonly from hydrology alterations or with exclusion of fire, wet prairie can become invaded by SP. These areas, if thought not to be historically wet flatwoods, were not classified as such. Regardless of canopy densities, these areas were typed as wet prairie to guide management towards a prairie condition, rather than a canopied system.



Shrubs are sparse and include roundpod St. John's wort, peelbark St. John's wort, myrtleleaf St. John's wort (*Hypericum myrtifolium*), fourpetal St. John's wort, gallberry, fetterbush, wax myrtle, dwarf live oak, saw palmetto, and pond cypress. This community contains a very diverse suite of herbaceous species commonly dominated by wiregrass and to a lesser extent blue maidencane (*Amphicarpum muhlenbergianum*), longleaf threeawn (*Aristida palustris*), bottlebrush threeawn (*Aristida spiciformis*), pineland rayless goldenrod (*Bigelovia nudata*), bearded grass-pink (*Calopogon barbatus*), pineland daisy (*Chaptalia tomentosa*), toothache grass (*Ctenium aromaticum*), woolly witchgrass (*Dichanthelium scabriusculum*), dwarf sundew (*Drosera brevifolia*), pink sundew, early whitetop fleabane (*Erigeron vernus*), flattened pipewort (*Eriocaulon compressum*), tenangle pipewort (*Eriocaulon decangulare*), whitehead bogbutton (*Lachnocaulon anceps*), water cowbane (*Oxypolis filiformis*), orange milkwort (*Polygala lutea*), sugarcane plume grass (*Saccharum giganteum*), and bog white violet (*Viola lanceolata*).

There was no OBVM Report for this community. Areas with a pine BA 30 square feet or higher could be clearcut to restore the natural community conditions. 2-3-year frequency of prescribed fires should eliminate any significant pine regeneration from occurring and taking over the site. Native ground cover species will benefit from frequent growing season prescribed fires as well.

DRY PRAIRIE (527.50 acres) MUs (10, 11, 25, 35, 36, 49, 78, 82, 101, 102, 105, and 110)

Dry prairie constitutes 2% of the total acreage on HHBCWMA. Wiregrass, low shrubs, stunted saw palmetto and dwarf live oak form most of the cover, with taller shrubs being infrequent to absent. LLP are few to absent in this community. Due to past fire history and applied roller chopping techniques, dry prairie is often difficult to discern from mesic flatwoods. Roller chopped mesic flatwoods commonly has very low structured shrub layer that appears to be stunted and is very similar in structure to a dry prairie habitat. Areas of dry prairie that have not received sufficient prescribed fire have excessively tall shrubs and/or canopy pines. These areas are difficult to impossible to differentiate from historic flatwoods. Historic aerial photography is useful in the delineation of these two similar habitats, but may not show or represent true historic conditions.

Dry prairie at HHBCWMA tends to occur adjacent to scrubby flatwoods habitats. Frequent fires are necessary to prevent the establishment of a LLP canopy in this community. In fire excluded areas of this community sparse sand live oak and live oak are present. Short shrubs form the characteristic stratum of this community. Commonly shrubs are less than one meter tall and include netted pawpaw, Atlantic St. John's wort, fourpetal St. John's wort, gallberry, gopher apple, coastalplain staggerbush, fetterbush, wax myrtle, dwarf wax myrtle, wild pennyroyal, dwarf live oak, runner oak (*Quercus pumila*), saw palmetto, and shiny blueberry. Herbaceous cover is variable and is commonly sparse to moderately dense. Characteristic dry prairie herbaceous species at HHBCWMA include bottlebrush threeawn, wiregrass, witchgrass, skeletongrass (*Gymnopogon* sp.), fringed yellow stargrass (*Hypoxis juncea*), whitehead bogbutton (*Lachnocaulon anceps*), shortleaf gayfeather (*Liatris tenuifolia*), narrowleaf silkgrass (*Pityopsis graminifolia*), blackroot (*Pterocaulon pycnostachyum*), little bluestem, lopsided indiagrass, and Carolina yellow-eyed grass. OBVM report desired future conditions are greater than or equal to 20% herbaceous ground cover. The OBVM survey showed 33% (174.08 acres) below the desired future condition.

Areas with a pine BA 30 square feet or higher could be clearcut to restore the natural community conditions. 2-3-year frequency of prescribed fires should eliminate any significant pine regeneration from occurring and taking over the site. Native ground cover species will benefit from frequent growing season prescribed fires as well. If prescribed fire isn't sufficient in increasing native ground cover, then artificial methods like planting wiregrass plugs or seeding other native herbaceous plants could be used.

RUDERAL

Ruderal communities are areas where the natural community has been altered because of human activity.

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Seven ruderal types were mapped on HHBCWMA. The *Timber Assessment* will look at three communities for possible restoration. Even though these three ruderal areas make up a small percentage of the total acreage on HHBCWMA, if restored they could improve the existing natural communities and increase biodiversity. Some of these areas are near the boundary of the property and visible to the public. This would allow for FWC restoration examples to be seen by the public. Managers may want to consider utilizing partners when restoring these areas. Boy Scouts or other organizations could be used to help supply volunteer labor, reducing costs of restoration.

AGRICULTURE (0.53 acres) MU 111

Agriculture area constitutes 0.02% of the total acreage on HHBCWMA. This community is in the southwest portion of the property, west of the pine plantation. The SI for LLP on agriculture area is 65. SI for SP is 75. Based on soil type this area should be restored to the scrubby flatwoods natural community, which it is adjacent to. Artificial regeneration (containerized LLP seedlings) planted at 400 trees per acre is suggested. After the first thinning of pines in 15-20 years native ground cover restoration can begin (1-10% cover). Plant wire grass plugs in the cut rows or seed with another native species.

ABANDONED FIELD (8.92 acres) MU 111

Abandoned field constitutes 0.03% of the total acreage on HHBCWMA. This community is found in the southwest portion of the property, west of the pine plantation. The SI for LLP on the abandoned field area is 60-65. SI for SP is 70. Based on soil type this area should be restored to the mesic flatwoods natural community, which it is adjacent to. Artificial regeneration (containerized LLP seedlings) planted at 605 trees per acre is suggested. After the first thinning of pines in 15-20 years native ground cover restoration can begin (greater than or equal to 15% cover). Plant wire grass plugs in the cut rows or seed with another native species.

CLEARING/REGENERATION (14.19 acres) MU (1, 34, 102)

Clearing/regeneration areas constitute 0.06% of the total acreage on HHBCWMA. This community is found in two areas and three separate pieces on the property. Two pieces are located along the northern boundary, just south of U.S. Highway 192. One piece is located near the vehicle access entrance to the property. The SI for LLP on the clearing/regeneration area is 65. SI for SP is 70. Based on soil types these areas should be restored to the mesic flatwoods natural community, which it is near. Artificial regeneration (containerized LLP seedlings) planted at 605 trees per acre is suggested. After the first thinning of pines in 15-20 years native ground cover restoration can begin (greater than or equal to 15% cover). Plant wire grass plugs in the cut rows or seed with another native species.

SCRUB (159.30 acres) MUs (21, 29, 49, 70, 81, 82, 90, 105, and 107)

Scrub constitutes 1% of the total acreage on HHBCWMA. The scrub is even aged stands. The dominant product class is sub-merchantable or pulpwood. The OBVM report showed majority (98%, 156.11 acres) of the scrub have a basal area less than or equal to 20 square feet. The SI for SP on scrub is 70. SI for SD is 60-70. SI for LLP is 65.

Scrub is a xeric woodland that occurs on well drained sand soils and supports a vegetation assemblage characterized by scrub oaks. This community burns infrequently relative to the typical flatwoods matrix it is formed within. Most the scrub found at HHBCWMA lacks any canopy stratum is best characterized by 6-15 ft. tall scrub oaks intermixed with sandy openings. The desired future condition of the herbaceous groundcover cover ($\geq 10\%$) is fully achieved for this community. The openings allow the rare large-flowered rosemary (*Conradina grandiflora*) and nodding pinweed (*Lechea cernua*) to persist in the sparse ground cover. The scrub community often occurs in isolated islands within the flatwoods communities. This landscape position maximizes the opportunity for fire to enter this community. Many areas of scrub on HHBCWMA have been identified as reference natural communities for Florida by FNAI for their exceptional open and low shrub structure. Areas that have been excluded from prescribed fire may



contain canopy associates including SD, SP, and LLP. Most this community is best classified as the oak scrub variant. Tall shrubs are often present and are moderately dense and intermixed with open areas of bare sand. Tall shrubs include rusty staggerbush, coastalplain staggerbush, fetterbush, SD, Chapman's oak, sand live oak, and myrtle oak. These same species can be found in the short shrub layer in addition to Florida rosemary (*Ceratiola ericoides*), Atlantic St. John's wort, gopher apple, dwarf live oak, saw palmetto, shiny blueberry, and deerberry. Herbaceous species are commonly sparse, which is typical for this community. Two rarities present in groundcover stratum of scrub at HHBCWMA are large-flowered rosemary (*Conradina grandiflora*) and nodding pinweed (*Lechea cernua*). The presence of these species indicates the high quality of the herbaceous layer. Other common groundcover species include arrowfeather threeawn, coastalplain honeycomb-head, Ware's hairsedge, coastalplain chaffhead (*Carphephorus corymbosus*), flatsedge (*Cyperus* sp.), witchgrass, Elliott's milkpea, southern bogbutton, October flower (*Polygonella polygama*), sandyfield beaksedge (*Rhynchospora megalocarpa*), and sand spike moss (*Selaginella arenicola*). Epiphytes are common in this community on scrub oaks. Commonly documented epiphytes include ballmoss (*Tillandsia recurvata*) and Spanish moss (*Tillandsia usneoides*). Vines were infrequent and represented by one species, earleaf greenbrier (*Smilax auriculata*).

Pre-merchantable timber thinning or mechanical woody plant control is required to maintain this early succession community. Usually best to rotate MUs in varying stages of understory height growth to allow habitat for the Florida scrub Jay (*Aphelocoma coerulescens*). Prescribed fire is necessary to manage this community both for overstory Pine BA and ground cover species.

PASTURE-IMPROVED (25.90 acres) MU 111

Improved pasture constitutes 0.10% of the total acreage on HHBCWMA. There is only one example of this anthropogenic ecological community occurring in the extreme southwest corner of the property. This community has heavy disturbance from cattle, clearing and exotic plant establishment. Improved pastures are defined as natural areas that have been stripped of most or all native vegetation and replanted in pasture grasses. This community lacks canopy trees, but does contain scattered wax myrtle shrubs. No native vegetation is evident and dogfennel (*Eupatorium capillifolium*) and bahiagrass (*Paspalum notatum*) dominate the groundcover. This community is adjacent to the pine plantation community and should be considered added with the pine plantation for restoration to mesic flatwoods community based on the soils. The SI for SP on improved pasture is 70-75. SI for LLP is 60-70. Artificial regeneration (containerized LLP seedlings) planted at 605-726 trees per acre is suggested. After the first thinning of pines in 15-20 years native ground cover restoration can begin (greater than or equal to 15% cover). Plant wire grass plugs in the cut rows or seed with another native species.

PINE PLANTATION (8.80 acres) MU111

The pine plantation constitutes 0.04% of the total acreage on HHBCWMA. There is one occurrence of pine plantation that is in the extreme southwestern portion of the property. The pine plantation at HHBCWMA is defined as densely planted off site slash pines, occurring in rows and lacking a significant or diverse assemblage of groundcover/ herbaceous species. This stand is even aged, approximately 35-40 years old, never thinned. The BA is estimated to be 100-120 square feet. The dominant product class is pulpwood, with occasional chip n saw size trees. The SI for SP is 70. SI for LLP is 60-65. The plantation is overdue for a thinning and wouldn't likely respond to one this late in rotation. The best option would be to clearcut the stand and re-plant with native LLP.

Prior to acquisition by the state of Florida, slash pine was planted in rows on what was historically mesic flatwoods. This community lacks both subcanopy and tall shrub strata. Short shrubs are sparse to moderately dense with generally low shrub heights. Short shrub species include gallberry, fetterbush, saw palmetto, and sparkleberry. The herbaceous layer is very sparse and species poor. Bluestem, slender flatop goldenrod, crowngrass (*Paspalum* sp.), bracken fern, blackroot, and queen's delight (*Stillingia sylvatica*) are the only noted herbaceous species. This community has received numerous applications of



prescribed fire and except for fairly dense pines in the canopy this community has decent vegetation structure. This community is adjacent to the improved pasture community. These two communities should be combined and restored to mesic flatwoods community based on the soils. Artificial regeneration (containerized LLP seedlings) planted at 605-726 trees per acre is suggested. After the first thinning of pines in 15-20 years native ground cover restoration can begin (greater than or equal to 15% cover). Plant wire grass plugs in the cut rows or seed with another native species.

SANDHILL (4.6 acres) MU (4 and 31)

The sandhill constitutes 0.02% of the total acreage. HHBCWMA contains one occurrence of sandhill located approximately ¾ mile south of Crabgrass Creek. This stand is even aged, maybe 80 years old. The dominant product class is sawtimber. The SI for LLP is 60-70. Sandhill is characterized by a canopy of widely spaced pine trees with a sparse midstory of deciduous oaks, and a moderate to dense groundcover of grasses, herbaceous, and low shrubs occurring over a rolling topography composed of deep sands. This community contains all the components needed to be classified as high quality, despite its minimal size. The open canopy contains mature LLP with a sparse subcanopy of turkey oak. Shrubs are also sparse and represented by sand live oak, turkey oak (*Quercus laevis*), gopher apple, dwarf live oak, live oak, saw palmetto, shiny blueberry, and deerberry. The herbaceous layer is dense and contains mostly wiregrass and to a less extent coastalplain chaffhead, narrowleaf silkgrass, blackroot, and snoutbean (*Rhynchosia* sp.). Open areas of bare sand can be found throughout. Maintain LLP BA at 40-60 square feet. Prescribed fire during the growing season should be applied to manage for native ground cover species.

PASTURE–SEMI-IMPROVED (1.70 acres) MU 111

Semi-improved pasture constitutes 0.01% of the total acreage on HHBCWMA. There is only one example of this anthropogenic ecological community occurring in the southwest corner of the property, west of the pine plantation. Semi-improved pasture is defined as natural areas that have been stripped of a significant percentage of their native vegetation and seeded in pasture grasses, but still retain some natural structure. This site contains a canopy of sand live oak and live oak. Shrubs are locally dense or have been removed and replaced with open areas of bahiagrass. Shrub species include sour orange (*Citrus x aurantium*), saw palmetto, Chapman's oak, sand live oak, and cabbage palm. Semi-improved pasture should be restored to the former scrubby flatwoods community based on soils. The SI for LLP is 70 on semi-improved pasture. Artificial regeneration (containerized LLP seedlings) planted at 605-726 trees per acre is suggested. After the first thinning of pines in 15-20 years native ground cover restoration can begin (greater than or equal to 15% cover). Plant wire grass plugs in the cut rows or seed with another native species.

GENERAL TIMBER MANAGEMENT GUIDELINES

Note: Any timber harvest, site preparation, seedling planting, or other timber management activity will adhere to Florida's Silviculture [Best Management Practices](#) Standards, available online. In addition, all known historical and archeological sites will also be protected.

A useful measurement of tree stocking and density is basal area (BA) per acre. BA is the cross sectional area (in square feet) of a tree measured four and one-half feet above the ground. The diameter of individual trees measured at this height is referred to as its diameter breast height (DBH). Fully stocked pine stands have enough trees per acre of a size large enough to utilize the growing space without causing over-crowding. SP and LLP stands with 70 to 100 square feet of BA are considered fully stocked. It requires more, smaller diameter trees than it does larger diameter trees to equal one square foot of BA. For example: It takes 357 evenly spaced, six-inch DBH trees to equal 70 square feet BA. Whereas, only



89 twelve-inch DBH trees per acre equal the same 70 square feet BA. BA can be roughly correlated to crown coverage and therefore needle-cast. About 40 to 60 square feet BA should provide sufficient needle-cast to carry prescribed fire and adequate sunlight for native grasses to be maintained.

Natural communities are dynamic things. A stand of scattered mature trees has not looked exactly as it does today throughout its existence. In natural, pine dominated forest systems trees die because they become old and less able to withstand insect and disease attack. SP has a life expectancy of about 100 years, while LLP can live more than 300 years. Bark beetles might invade a weakened tree then multiply and kill some of its neighbors. Lightning strikes and windstorms do the same thing. Thus, holes of various sizes are continuously being created in the canopy. These openings allow full sunlight to reach the forest floor. In addition, lightning caused fires burn away leaf litter and expose bare mineral soil. The bare soil and canopy openings permit large numbers of sun loving pine seedlings to become established and grow straight and tall.

Where naturally occurring fire has kept the understory open, pine seedlings become established in these canopy holes at very high densities. It is common to have ten to twenty thousand seedlings per acre in scattered openings. Recurrent wildfires and competition for sunlight, moisture, and nutrients favor the strongest, fastest growing pine saplings. The rest die off continually over the life of a stand of trees until the trees mature and another opening is created that replaces the survivors with young seedlings again. The result is an uneven aged stand where each group of trees created by a canopy opening is about the same age. However, the stand is a mosaic of clusters that have different ages and densities. The long-term BA will fluctuate around a constant figure depending on soil productivity (as low as 20 square feet on extremely poor sites, up to 80 square feet on highly productive sites). The ultimate goal of ecologically based timber management is to mimic these natural processes and still be able to harvest trees that are destined to die anyway. The challenge is to capture the value of the timber while minimizing any negative impact on the system as a whole.

Thinning type harvests in pine stands help maintain the health and vigor of the stand by removing weak, diseased, and deformed trees. Enough co-dominant trees are removed during thinning to insure crown retention and continued growth in the remaining trees. To create uneven aged pine stands, group selection openings are cut during thinning activities. These openings allow young trees to become established by seed falling from nearby trees or by planting seedlings. Since pine seedlings require direct sunlight to grow, all trees within the opening must be removed. However, to minimize the visual impact, openings can be as small as one-half acre. For natural regeneration, the minimum width of the openings is about two to three chains (1 chain=66 feet). Lack of cover followed by dense stands of young pine trees created by large openings can become impediments to animal foraging and migration patterns. For example: To prevent saplings growing in these openings from becoming barriers to RCW flight patterns, group selections should not exceed five acres in size.

Combined acreage of all openings cut within a stand during each thinning is kept to no more than five to ten percent of the total stand acreage. Since each stand only gets thinned every ten-plus years, over-harvesting of old-growth trees is avoided and a steady supply of young trees is ensured. For example: suppose that today there is a stand of 20 year-old pine trees. Every 10 years 95% of a stand gets thinned to keep the canopy open and 5% clearcut to allow regeneration of young pines. At the end of the tenth cutting cycle (100 years from now) 50 % of a stand would have 120+ year-old trees and 50% would range from seedlings to 100 year-old trees. If the cutting cycle is extended to 20 years (which is more likely on poorer soils) and 10% is cut for openings, the age distribution at the end of 100 years is the same as for the 10 year cycle.

Planting activities, group selection openings, hardwood control measures, and natural regeneration in thin stands will produce young tree stands of various sizes. A well-stocked stand of young pine trees will



usually require the removal of weak, diseased, and some overcrowded trees beginning by the age of 15 to 20 years. By this time, the crowns have grown together and ground cover begins to get shaded out and hardwoods can begin to compete with shade intolerant pine seedlings. Harvesting a portion of the timber maintains healthy pine growth and provides sunlight to the forest floor. Trees removed in the thinning process can be sold to generate revenue to be used in other land management projects. Likely markets for early thinnings from pine stands currently include pulpwood, fence posts and landscape mulch.

Due to shading effects, trees grown in tight spacing produce fewer and smaller lower limbs. The shedding of the lower limbs makes them more desirable for fence posts and later, more valuable products. Planting at least 500 seedlings per acre also helps insure the marketability of the pine trees and increases future management options.

The need for second and later thinnings depends on how low the BA was taken in the first thin and successive growth rate. If the BA is reduced to 50 to 70 square feet in the first cut, another harvest will probably be needed in ten to fifteen years. Trees removed from the second and succeeding operations produce ever more valuable products and therefore more money. Current market conditions have some second thinning products worth at least five times as much as the original wood that was cut. Third thinning trees can be worth twice as much as the second thin. All this revenue can be generated and still have a stand of pine trees and a healthy ecosystem.

TIMBER MANAGEMENT RECOMENDATIONS

HHBCWMA is a large tract of land. Identifying individual stands and defining exact acres requiring a specific management practice is beyond the scope of this assessment. A more detailed timber stand description would be required to properly plan long-term timber management recommendations. The following are general descriptions and management recommendations. A prime objective on this tract is to establish and maintain a healthy ground cover of grasses and forbs. Adequate sunlight must reach the ground to achieve this goal. From a timber management standpoint, this means that in general pine-stocking levels should be maintained in the 40 to 60 square foot BA range. Another objective is the management of RCW foraging habitat. This would require a 40 to 70 square foot BA of pines equal to or greater than 10 inches DBH. Trees with DBH less than 10 inches maintain less than 20 square feet BA. Both requirements are within a quarter mile around a RCW cluster. Leave trees should be mature (30 years or older), healthy, vigorous, and well-spaced.

BA < 10—These areas have insufficient pine trees to regenerate themselves. Stands within one half mile of the center of RCW cluster require pines with 10-14 inches DBH to have 0-40 square feet BA and Pines less than 10 inches DBH should have 10-20 square feet BA. Control the saw palmetto and sabal palms using roller drum choppers and fire. Plant SP or LLP as described under the *Artificial Regeneration* section below.

10 to 30 BA—These stands may or may not have enough seed trees to regenerate themselves. Though for certain, any further loss of mature trees could preclude a healthy future. Stands with these marginally low BA should be included in the regeneration plan. See *Natural* and *Artificial Regeneration* sections below.

40 to 70 BA—These stands have an adequate number of pine trees to utilize the growing space without overcrowding. No harvests are necessary in these stands unless thinning is required to allow access for roller drum chopping of palmettos, palms, or other overgrown woody vegetation to maintain the RCW foraging requirements. Stands within one half mile of the center RCW cluster need thinned to minimum 40 square feet BA. If chopping is needed, follow spacing recommendations as described in the *Natural Regeneration* section. In large stands with little regeneration, some group selection openings may be cut to promote seedling establishment.



80 BA & UP—Pine stands with this level of stocking are probably beginning to shade out the ground cover. Stands within one half mile of the center RCW cluster need thinned to minimum 40 square feet BA. Stands not managed for RCWs should be thinned to 40 to 60 square feet BA. If chopping for palmetto control is needed, follow spacing recommendations as described in the *Natural Regeneration* section. Group selection openings should be scattered throughout these stands to promote seedling establishment.

MISCELLANEOUS FOREST PRODUCTS

PINE STRAW

Pine needle raking could be an option to convert the disturbed lands (pine plantation, semi-improved pasture, improved pasture, agriculture, abandoned field and clearing/regeneration) into native communities, while still generating money. Since these areas are already highly disturbed, the use of herbicides to control the understory for easy needle raking, would have less impact than in stands with native ground cover species. Pine straw raking operations generally are set up for multiple year contracts where either the landowner or buyer agrees to spray/mow the understory to keep it clean of woody plants and grasses for ease of raking and equipment maneuverability. Pine straw raking can begin as soon as year 6, generating 50-75 bales/acre and be carried through the third thinning of a stand in some cases. Depending on several factors like species of pine (longleaf is best) and fertilization, it is possible to harvest 200-300 bales/acre at the maximum output (around yr. 15). Income can range from \$0.50-\$0.70/bale. Pine straw raking in a stand coincides with prescribed fire use and in some cases can be conducive with wildlife management. Money generated from pine straw raking is a good way to offset the planting costs of the stand as well as ground over restoration. *Note: higher density plantings of 726 trees per acre (6' X 10' or 5' X 12') are required to create a stand with the conditions favorable to needle raking.*

SILVOPASTURE

Silvopasture is an agroforestry practice specifically designed and managed for the production of trees, tree products, forage, and livestock. As a silvopasture, timber and pasture are managed as a single integrated system. Silvopastoral systems are designed to produce a high-value timber component, while providing short-term cash flow from the livestock component. Overall, silvopastures can provide economic returns while creating a sustainable system with many environmental benefits. This practice could be implemented on the pine plantation, semi-improved pasture, improved pasture, agriculture abandoned field and clearing/regeneration communities of HHBCWMA as a way to restore flatwoods communities, while still generating income from cattle leases.

A typical silvopasture system has pasture grasses of bahiagrass or bermudagrass and a tree planting density of 100-450 TPA. Loblolly, longleaf or slash pine species can be used. LLP or SP should be used on HHBCWMA. For timber production, a spacing of 4' X 8' X 40' would result in 454 TPA. For forage production, a spacing of 2' X 8' X 88' would result in 454 TPA. See *Site Preparation* section below for specific recommendations, but generally scalping rows a couple months prior to planting will be required. Herbicide treatments may also be required in dense pasture grasses. The following example uses data from *Projected Timber Yields of South Florida Slash Pine Silvopasture in South-Central Florida* by Ezenwa, Kalmbacher & Mallett. Starting with a new silvopasture system, plant LLP or SP (454 TPA at 4' X 8' X 40') in an established pasture of bahiagrass. Wait to introduce cattle into the planted stand until the trees reach head high (about 3 years). This will prevent cattle damaging the young buds and stems of the planted trees. Approximately 5 cow-calf-pairs and two bulls per 2.5 acres can be allowed to graze from March to October. When the stand reaches age 20; thinning 25% of the stand would result in 12.6 tons/acre of timber, generating \$25.16/acre in timber revenue. The total forage yield would be approximately 1,264 pounds per acre/ per year.



SALVAGE SALES

On occasion, small volumes of wood may need to be removed due to fire, windstorm, insect, or other damage. The decision whether or not to harvest the affected timber will depend on the threat to the surrounding stands and the volume/value of the trees involved. For example, small, isolated lightning-strike beetle kills are a natural part of a healthy ecosystem and normally would not be cut. However, if a drought caused the insect infestation to spread, the infected trees and a buffer zone might have to be removed. *Note: due to forest health and timber market factors, it is recommended contacting the FFS Forester as soon as possible.* Many times a salvage sale may be added to an existing sale to expedite the removal of dead and dying trees.

LONG TERM RECOMENDATIONS

Many factors affect the need for and timing of future thinnings. These include initial planting density, number of trees surviving to merchantable size, crown closure (ground cover shading), and a live crown ratio below 40%. These recommendations are guidelines to be used in areas where the described conditions exist on newly acquired lands, currently unknown stands, and in the distant future as planted seedlings and natural regeneration matures.

REFORESTATION

NATURAL REGENERATION (ONLY USED WITH MATURE, CONE BEARING TREES)

The following methods of natural regeneration should be applied to current and future stands that have adequate number of seed trees. LLP and SP require 30 square feet BA. For example, LLP would be a minimum of 55 trees per acre at 10" DBH. SP would be a minimum of 12 trees per acre at 10" DBH. LLP generally have a good seed year on a 3-7 year cycle. SP generally produce seeds on a 1-3 year cycle. When a good seed crop is anticipated by either flower or cone crop counts the previous year. The MU should be treated with one of the following site preparation methods described below.

10 to 30 BA- Stands within one half mile of the center of RCW cluster require pines with 10-14 inches DBH to have 0-40 square feet BA and Pines less than 10 inches DBH should have 10-20 square feet BA. Control saw palmetto height and density. This can be accomplished by burning the stand in late winter or early spring to remove most of the fronds. Then roller drum chops the palmettos prior to the summer rainy season with a chopper heavy enough to sever their stems (probably a medium or heavy, single or tandem, but not offset). A second burn in the summer after the chopping is complete would be beneficial if a fire will carry.

If for any reason an adequate number of young seedlings are not established by the second summer following the initial chopping, burn the stand again prior to end of the rainy season. This will allow some grasses to re-grow enough to protect the seeds and fragile seedlings from the hot sun.

30 to 50 BA- Again control saw palmetto as above. These stands may require thinning alone or in combination with group selection cuts to allow the roller choppers to treat the palmettos without killing remnant pine trees. Spacing between leave trees or clusters of leave trees should be at least 20 to 30 feet to give room for the tractor and chopper to operate. Group selection openings should be at least two chains (132 feet) wide to allow adequate sunlight for sapling growth. Follow the fire regime as described above. Stands within one half mile of the center of RCW cluster require all pines greater than or equal to 10 inches DBH have a minimum BA of 40 square feet.

> 50 BA- These stands need reforestation treatment only where saw palmetto must be controlled or additional age classes are desired (i.e. insufficient number of trees younger than ten years old). Stands



within one half mile of the center of RCW cluster require all pines greater than or equal to 10 inches DBH have a minimum BA of 40 square feet. Where palmetto control is a priority, thin pines to 30 to 40 sq. ft. per acre (at least 20 to 30 feet between leave trees or clusters if chopping is required). Scatter group selection openings throughout the stand. Roller chop the stand, evaluate success, and implement fire regime as above. If palmetto is not a problem, skip the chopping, then evaluate success and burn as above.

Successful establishment of LLP and SP stand requires 1,000 or more seeds per acre to have seeded in, and begin growing. Timing of reintroduction of prescribed fire into regenerated stands depends on seedling height growth and fuel loads. Generally, 400 or more trees per acre should be at least head-high in light fuels before the stand is burned. With short trees and heavier fuels, the first burn might have to be accomplished at night to prevent excessive scorch and mortality. These stands can probably be returned to the normal burn rotation following the first post-establishment burn, if fuels are light and fire frequent enough. See artificial regeneration methods, if more consistent and quicker results are required.

ARTIFICIAL

Some of the MU on HHBCWMA will require artificial regeneration in order to restore the land back to historical mesic, scrubby and wet flatwoods and scrub, community types. To minimize damage from reproduction weevils, do not plant pine seedlings where pine stumps are present until at least one growing season has passed since the harvest.

The following recommendations are designed to generate the highest possible revenue stream while maintaining healthy ground cover. In areas where native ground cover is to be restored, consider planting pine seedlings immediately after sowing the seed and packing of the soil. This should help reduce losses due to moisture competition from established grasses during dry weather. Follow the fire regime described above in the *Natural Regeneration* section.

SITE PREPARATION

Prescribed fire may be used to prepare the planting site for hand planting or machine planting. Burn in the fall to provide access for planters, reduce groundcover competition (short term), hardwood and palmetto control, and allow adequate sunlight to the ground. Negative aspects of fall burning include lack of suitable habitat for wildlife until the spring growing season, and if not performed under the correct weather conditions, scorching of mature pine over-story can occur.

Mowing and roller chopping have also been used for site preparation; these techniques allow sunlight to reach the germinating seed or planted seedlings. Negative impacts include mowed/chopped debris on the ground, which can inhibit good soil to seed contact, and potentially the buildup of too much fuel for burning that can be damaging to new seedlings. Mowing "selects" for grasses, but like disking, roller chopping selects for forbs resulting in reduced fine fuels and soil disturbance of native groundcover.

A word of caution about planting in established pastures. To ensure adequate survival and avoid the expense of replanting, some form of herbicidal control, scalping, or deep disking of heavy grasses may be necessary. Competition from grass for soil moisture during hot, dry weather can cause severe losses of young seedlings. Applying a contact herbicide such as Roundup either in two-foot-wide strips or in spots can control these grasses. The herbicide should be applied far enough in advance of planting time so the grasses have time to "brown up" and indicate where to plant the seedlings.

If deep disking is used on heavy grass pasture, it should be accomplished during dry weather. The upturned earth should remain dry for about one month. Then the soil should be roller packed or have sufficient rainfall to settle and remove air pockets prior to planting. This method of grass control may be less expensive than herbicide treatments. However, the potential exists for poor survival due to



inadequate grass control and improperly compacted soil. In addition, noxious weed seeds are often brought to the surface where they germinate and out-compete with the young pines or cause other problems. Therefore, this method is not recommended.

A release treatment of herbicide can be applied after planting to aid in the new seedlings survival. Once seedlings have started root growth apply a 6 ft. band over planted rows in mid-April to mid-May, with 2oz OustXP + 24oz Velpar L for herbaceous weed control (wiregrass is tolerant). This could be used for example if the site prep could not be completed before planting. If the site has extra dense hardwoods that should be controlled apply a broadcast foliar spray in June to October, 40-48 oz Chopper Gen2 + 2-3 qts. Accord XRT II. Alternatively, a spring treatment with Velpar L 2-6 qts. could be applied to treat the hardwoods to allow the seedlings adequate growth before regular prescribed burning can resume. Some units may require a combination of chemical then prescribed burn or mowing/chopping then prescribed burn to prepare the site for planting and ensure good survival in the subsequent years.

HAND PLANTING

Hand planting of containerized (tubeling) forest source LLP or SP seedlings is one option for reestablishment in areas where an inadequate number of seed trees exist. Bare-root trees are planted in the winter. Tubelings can be planted in winter or summer, thereby extending the planting season. Plant approximately 600 bare root seedlings per acre at varying spacing, but averaging 6' X 12' overall. Due to the increased likelihood of survival and higher cost of containerized seedlings, as few as 500 seedlings per acre can be planted (8' X 11'). Still, for fear of not being able to reestablish essential grasses, land managers may insist on planting less than the recommended number of pine seedlings overall. To ameliorate these concerns, 400 seedlings per acre can be hand planted in small, irregularly shaped clusters (2 to 5 acres) with 2 to 5 chains between clusters. If machine planting is employed, plant 3 to 5 curved rows (9' X 12'). Leave 2 to 5 chains unplanted between sets of rows. The entire area can be inoculated with native grass seed prior to planting the LLP or SP seedlings. However, tremendous cost savings can be made by only sowing the area between tree plantings and relying on these areas to seed the rest over time.

MACHINE PLANTING

Meander planting containerized LLP seedlings at an average spacing of 6' X 12' yields about 600 trees per acre. It is more difficult to vary the spacing and make the planting look random with machine planting. This is due primarily to the inability of tree planters to make sharp turns and still pack the soil around the seedlings roots. Tight turns are also hard on the planter's bearings. The desired effect can be obtained by gradually curving the planting rows and varying the distance between and within the rows. Another way to create the random look is to locate the planting rows twice as far apart as normal (averaging approximately 24'). Then, plant a second set of rows at some angle approaching 90 degrees to the first set of rows spaced about the same distance apart.

Again competition for soil moisture during dry weather can cause heavy losses of seedlings and waste of planting costs. Where grass is thick, it is best to either herbicide strips as described above or use a combination planter/scalper to plant the seedlings. The scalper should be set to no more than 2 to 3 inches deep and 18 to 24 inches wide. These settings will minimize soil disturbance and maintain continuity of fuels for future prescribed burns, but the seedlings will have a decent chance of survival.

GROUND COVER RESTORATION

The ground cover on most of HHBCWMA has been impacted by past management practices to varying degrees, depending on the community type. Native grasses and forbs were partially or entirely replaced by imported varieties like bahiagrass in some instances, while logging, changes to hydrology and altered fire regimes have changed the composition of species in other communities. These alterations to the



groundcover do not promote burning during the natural lightning-induced fire season. Some communities, like pastures also have introduced invasive exotic species that don't carry fire as well as the native ground cover. Pine stands within one half mile of the center of an active RCW cluster require native bunchgrasses and or native herbs to represent 40% or more of the ground and midstory plants and have a sufficient density to carry fire once every 5 years.

Reestablishment of native groundcovers can be extremely expensive. Many methods have been tried with varying degrees of success. The following describes an alternative method to the expensive direct planting of containerized seedlings. It has worked on similar sites across the region. To get the ground ready to accept the seed, improved pastures often require multiple treatments with high priced herbicides. One or more passes with a heavy disc usually follow the herbicide applications. Depending on the ground cover, pastures may only need a single disking and one or no herbicide spraying prior to seeding. The pastures on HHBCWMA have many invasive exotic plants that should be removed with herbicide before the planting of native ground cover begins.

Undisturbed donor sites are chosen that have similar soil types as the area to be re-vegetated. Sites are burned at the right time (usually spring to early summer) to produce viable seed from a broad spectrum of native plants. Mechanical harvesters are used to gather the seeds. More than one trip maybe required, over a period of weeks, and with the machine set at different heights to get seeds from all the species found at the donor site. This precious cargo is hauled to the treatment site and scattered across the field using a hay blower. Some form of roller, light disc or packer should then be used to insure close contact with the soil. Results vary, but if everything goes well, at least some of each species becomes established. Following the planting with well-timed prescribed burns should stimulate seed production in the newly established vegetation and further spread each species.

PRESCRIBED FIRE

Frequent lightning induced fires are natural to most Florida's natural communities. Prior to European settlement, they occurred at regular intervals of one to five years. Without fire, native habitats would probably have turned into densely shaded hardwood hammocks. Introduction of effective fire suppression in the mid-1900's resulted in thick stands of saw-palmetto and subsequent loss of other grassy and herbaceous ground covers. Use of prescribed fire is essential to the maintenance of open healthy, pine-dominated ecosystems. The needles shed by pine trees planted in old pastures help carry fire across the landscape which in turn helps maintain fire dependent communities.

HHBCWMA appears to have a good burn history per FWC records. Most BUs are receiving burns within the 4-5 year fire frequency recommend for mesic and wet flatwoods. It is recommended that this frequency is maintained. One suggestion would be to consider adjusting the season of burning (growing or dormant). The season to burn in depends on the objectives for the prescribed burn. Dormant season; fuels reduction, wildlife management (some), and duff removal in fire suppressed units. Growing Season; stimulate herbaceous seeding, site prep for planting, RCW habitat maintenance and kill woody vegetation. Grassy fueled fires produce less lingering smoke than woody fuels. Mechanical or chemical treatments followed by frequent prescribed burns should stimulate grasses and decrease the amount of woody understory.

Caution must be exercised when reintroducing fire into these systems, as desirable as burning is. Survival of (expensive, newly planted seedlings or time intensive, natural seedlings) as well as valuable mature timber depends on timing and careful execution of burns. To prevent damage to delicate root systems and avoid smoky duff fires, be sure that there is adequate moisture in any organic matter thicker than approximately one inch. In stands with heavy duff layers, try to burn no more than one inch of duff at a time on approximately two to three-year intervals. At least the first burn should be at nighttime, during



the dormant season after the seedlings have reached six feet or more in height and there is enough needle litter to carry the fire. If ground fuels are not too heavy, succeeding burns can be switched to the growing season.

ACCESS

Currently, there are over 16.8 miles of improved and unimproved roads on HHBCWMA. In order to minimize human disturbance, there is only one designated vehicle entrance to the HHBCWMA, via the improved Crabgrass Road, south of U.S. Highway 192, on the northwestern side of the property. Interior roads are unimproved and include Cemetery, Loop, Cross, and Billy Lake roads. There are also seven small game trails which are accessible by four-wheel drive or ATV only. Most of HHBCWMA has a plowed or disked boundary that is mostly accessible only by ATV. Also there is management access to HHBCWMA from SJRWMD on the eastern boundary, via an unimproved road on top of the Army Corp of Engineers' Levee 73.

HHBCWMA has an adequate network of established roads that can be used for most forest management purposes. However, many of them may require improvement with rock or shell and some tree/brush clearing to support the larger size and weight of trucks and equipment used in timber operations. It would be beneficial to establish a few interior primary improved roads for access to quadrants of the tract that have timber resources. Areas that will need road work are the mesic and wet flatwoods MUs that are near Billy Lake, the creeks and levee. These MUs have altered hydrology and may be wetter longer than usual. This work will also benefit other activities including; recreation, hunting access and prescribe burning. It also will reduce wear and tear on FWC trucks and reduce travel time across the area.

ECONOMICS

HHBCWMA has several MUs that can currently use a timber thinning. Most of these MUs are in the mesic and wet flatwoods community type, they are natural even-aged stands, mature (over 30 years old) LLP or SP and have a BA over 80 square feet. An example is described below of what could be expected from a timber sale in these MUs. Volumes were obtained using *U.S.D.A. Research Report No. 3, Growth and Yield of Slash Pine Plantations in Florida*, by R. L. Barnes. These figures assume fully stocked, even-aged stands with thinning harvests at the earliest age needed. Revenues are stated in current dollars for comparison purposes and based on the *US South Stumpage Price Trends by Region: July/August 2016*, online publication from Forest to Market. About one-third of the trees may be harvested during the first thinning. In stands reaching the age 25 to 30, there would be about 12 to 15 cords (34 to 42 tons) per acre. Probably half of those volumes 6 to 7.5 cords (17-21 tons) per acre would be pulpwood and the other half chip-n-saw quality or better at time of thinning. In today's dollars and market one could expect the pulpwood to sell for \$9.37 per ton and chip-n-saw to sell for \$15.67 per ton. A timber sale could be worth about \$426 to \$576 per acre. If a typical timber sale of 275 acres (2%) of the mesic and wet flatwoods total acreage was conducted it would generate \$117,150-\$158,400 revenue. Uneven-aged management may reduce timber growth and revenues by up to one-half to three-quarters

Likely purchasers of forest products from HHBCWMA include; 19 upland timber vendors, 8 vendors specializing in cabbage palms, 7 vendors harvest pine straw. There is one sawmill in Osceola County and two mulch mills in Polk County where purchasers would likely sell their timber. More timber is sold in the region than might be expected. In the past timber harvests have taken place on State Forests and other Wildlife Management Areas in the region. HHBCWMA is located 20.2 miles from the closest sawmill, 61.5 miles from the closest mulch mill and 167 or more miles from most of the pulpwood markets. The cost of hauling the trees to large, north Florida mills has a tendency to keep timber prices down and reduce interest in timber offered for sale. Therefore, successful timber sales may require timing to match the market. When north Florida woodlands are inundated with water and south Florida is dry, loggers

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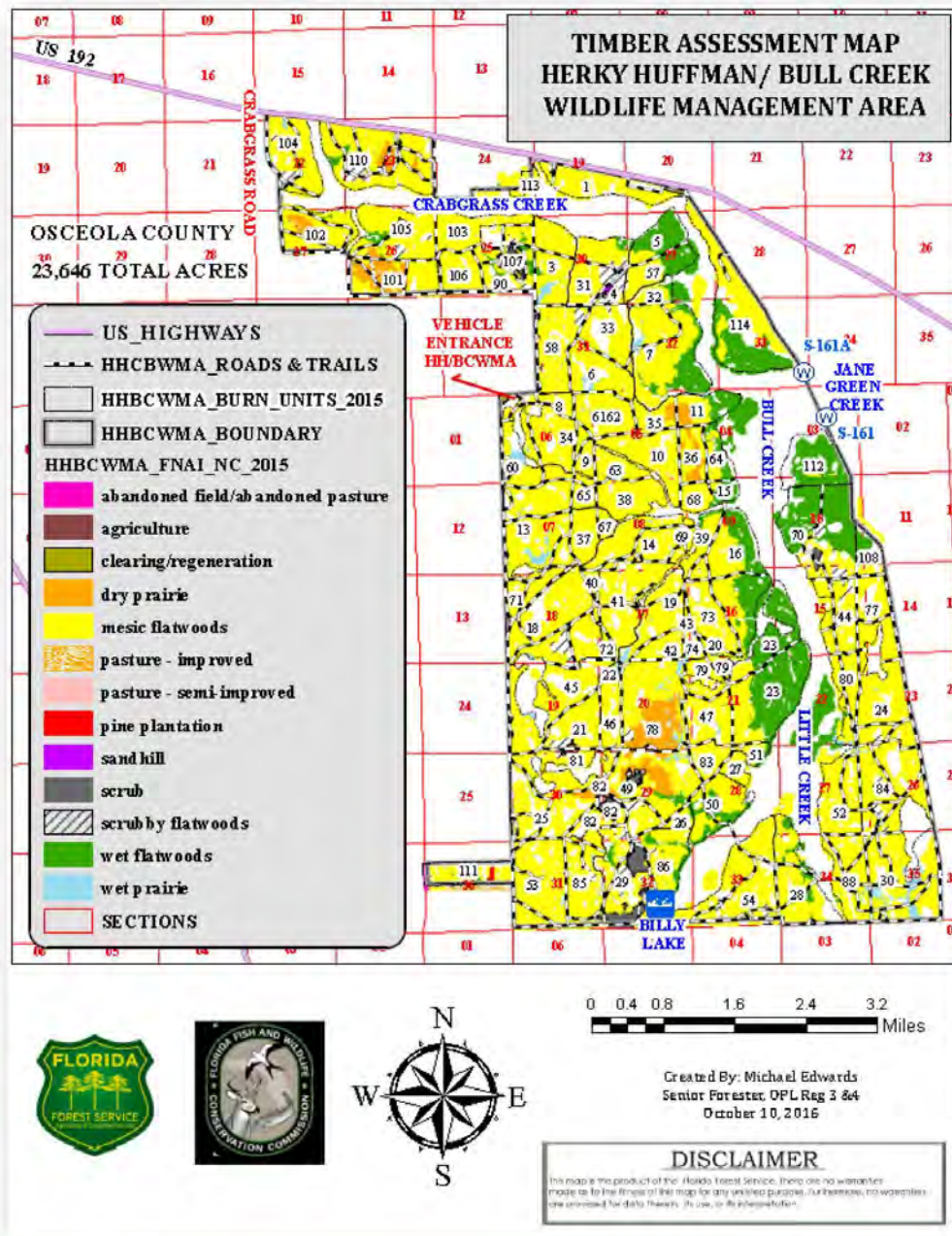
tend to drive long distances to obtain wood from drier land. These circumstances allow local land managers to take advantage of the opportunity to sell timber that otherwise might be hard to sell. The secret to timing the markets is to be flexible about when stands should be cut and keeping up with market factors throughout the state.

SUMMARY

In rapidly urbanizing areas of the state, public lands are often the only refuges for native plant and animal communities. Restoring and maintaining these ecosystems is an important function of land managers. Saleable timber is a byproduct of good ecosystem management. Carefully designed timber harvests; protect water quality, create openings in the tree canopy allowing sunlight to reach the forest floor, promote herbaceous growth and pine regeneration. Timber harvests can also be compatible with RCW and other wildlife management. New pine seedlings (natural or artificial) then grow to replace trees killed by lightning, wind damage and insects or disease. Mechanical equipment involved in timber harvests helps reduce dense understory vegetation such as sabal palms, saw palmetto and undesirable hardwoods. Thinning of dense timber stands can result in enough space between trees to allow a tractor pulled roller-drum chopper to be used further reducing the understory vegetation. This fuels reduction results with easier, safer, and more effective prescribed fire usage. The ability to maintain a frequent burning schedule is essential to keeping healthy ground cover and habitat for RCWs. These clearings and their ecotones are favorite spots used by wildlife for feeding, resting, mating, nesting, and rearing of offspring.

Land managers for HHBCWMA have expressed a desire to restore native groundcover. Just as important to these natural communities is the reestablishment of vertical structure provided by trees and the reintroduction of periodic fires. Pine BA of 40 square feet is the minimum required to have adequate needle cast. Needle litter from growing pines helps carry these frequent, low intensity burns in all restoration scenarios, the exact methods and final results will be guided by the best available ecological information to conserve biodiversity of the affected habitats.

Clearly, managing trees for timber as part of the overall management strategy is worthwhile for many reasons. Timber sale revenues can relieve the long-term burden on taxpayers for much needed management activities. As general revenue funds become more difficult to secure, revenues generated from sale of timber thinnings and miscellaneous forest products can be used to pay for habitat restoration, pine reestablishment and HHBCWMA's comprehensive Management Plan.



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12.15 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

12.16 Land Management Uniform Accounting Council Categories

Land Management Uniform Cost Accounting Council

Uniform Land Management Cost Categories and Subcategories

1. Resource Management

- a. Exotic Species Control. -- Invasive exotic plant and animal removal activities and costs for inventorying, planning, preparing, executing, evaluating, monitoring and reporting. Also includes equipment, chemicals, protective clothing and supplies. Includes nuisance native feral animal and plant control.
- b. Prescribed Burning. -- Prescribed burning activities and costs for assessing, planning, preparing, executing, evaluating and reporting. Also includes equipment, protective clothing and supplies.
- c. Cultural Resource Management. -- Management activities and costs for assessing, planning, executing, evaluating and reporting, and for all maintenance, restoration or monitoring activities for prehistoric and historic sites, features and collection objects.
- d. Timber Management. -- Activities and costs related to the establishment of a stand of potentially merchantable timber, harvest of merchantable timber, and cultural treatments intended primarily to improve the growth and overall health of a stand of merchantable timber. Also includes activities and costs related to the cutting of merchantable timber in natural community and habitat restoration projects.
- e. Hydrological Management. -- Hydrological management and restoration activities and costs for assessing, monitoring, planning, preparing, executing, evaluating and reporting. Includes water level management, repair, removal or back-filling of ditches, canals, berms and dams. Also includes water quality and water quantity monitoring.
- f. Other. -- All other resource management activities and costs not captured in other specific subcategories. Examples include natural community and habitat restoration through other techniques; plant, animal or biological community survey, monitoring and research; listed species management; technical assistance; and evaluating and commenting on resource impacts to parks.

2. Administration

- a. Central Office/Headquarters. -- Headquarters units conducting general administration of land under management by the agency. Includes upper management direction,

administration and fiscal, budget, personnel, purchasing and record keeping required for operations oversight and specific programs. Includes all duties unless they specifically relate to other categories or subcategories.

- b. Districts/Regions. -- Sub-state administrative districts or regions conducting general administration of the properties under their management. Includes all duties, unless they specifically relate to other categories or subcategories. General operating costs of district or region administrative facilities are included.
- c. Units/Projects. -- Conducting general administration duties at a specific management unit (state park, state forest, state wildlife management area, etc.). Includes supervisory duties, fiscal and record keeping duties, and any other duties that do not specifically relate to other categories or subcategories. General operating costs for the property, such as utilities, telephones and garbage collection, are included.

3. Support

- a. Land Management Planning. -- Developing land management plans required by Sec. 253.034, F.S. Includes researching and compiling plan information, materials and maps, coordinating planning activities, conducting review activities (internal reviews, public meetings, advisory group meetings, ARC, etc.), and promulgating draft plans and final plans.
- b. Land Management Reviews. -- Planning, organizing and conducting land management reviews by teams created under Sec. 259.036, F.S. Includes preparing and responding to land management review reports. Also includes similar work conducted as part of internal agency land management reviews.
- c. Training/Staff Development. -- Staff training and development costs incurred in any facet of the agency's land management activities.
- d. Vehicle Purchase. -- Acquisition of any vehicle purchased primarily for land management purposes or to support any category of land management activity by the agency.
- e. Vehicle Operation and Maintenance. -- Costs of operating and upkeep of any vehicle used by the agency to support any category of land management activity.
- f. Other. -- Any other support activity or cost not captured by other categories or subcategories.

4. Capital Improvements

- a. New Facility Construction. -- Use of Fixed Capital Outlay (FCO) or other budget authority for all new facility design and construction activities. Includes new roads, parking and all other infrastructure.
- b. Facility Maintenance. -- Use of Fixed Capital Outlay (FCO) or other budget authority for all repairs or renovations to existing facilities, roads or other infrastructure. Also includes ADA accessibility improvements and renovations.

5. Visitor Services/Recreation

- a. Information/Education Programs. -- Interpretive, environmental education and marketing programs that explain or promote the agency's mission or instill in visitors an understanding and appreciation for Florida's natural and cultural resources and their proper use and care. Includes signs, brochures, maps and other public information materials that are produced or disseminated.
- b. Operations. -- Includes the non-administrative and non-support costs involved in providing public access to lands. Includes all actions required to manage visitor activities in a way to ensure safe and enjoyable use by the public. Includes routine maintenance, cleaning and other work required to provide safe and efficient utilization of facilities and resources that support visitor use and recreation. Includes protection activities required by staff to safeguard natural and cultural resources, facilities, material, staff and visitors.

6. Law Enforcement

The provision of all activities for enforcing criminal, conservation and boating laws on land, freshwater and marine environments and all costs associated with these services. Includes the provision of uniform patrol. Includes overt and covert criminal investigations. Includes regulation of commercial wildlife trade. Also includes the direction and administration of all law enforcement programs and activities, and all associated costs.

Land Management Uniform Accounting Council and FWC Activity Code Groupings

Resource Management

Exotic Species Control

- 210 Exotic species control
- 211 Exotic plant control (mechanical)
- 212 Exotic plant control (chemical)

Prescribed Burning

- 205 Prescribed burning
- 206 Prescribed burning C growing season (April 1 to September 30)
- 207 Prescribed burning C dormant season (October 1 to March 31)
- 208 Firebreaks

Cultural Resource Management

- 201 Cultural resource management

Timber Management

- 202 Timber management

Hydrological Management

- 215 Hydrology management
- 216 Dams, dikes, levees
- 217 Canals
- 218 Water level management
- 194 Lake restoration

Other

- 185 GIS
- 186 Biometrics
- 200 RESOURCE MANAGEMENT
- 203 Tree and shrub planting
- 213 Wildlife management
- 214 Listed Species management
- 219 Upland restoration
- 282 Herbaceous seeding
- 283 Clearings
- 289 Native vegetation management (mechanical)
- 290 Native vegetation management (chemical)
- 221 Animal surveys
- 228 Inland aerial surveys
- 235 Vegetation and plant surveys
- 250 MONITORING AND ASSESSMENTS
- 252 Biomedical monitoring
- 253 Ecological monitoring
- 256 Habitat monitoring analysis
- 263 Nest box monitoring
- 264 Population demographics
- 295 Biological data collection, analysis, and reporting
- 275 Permits and authorizations

- 276 Commission rule development and review
- 277 Relocation
- 278 CITES tags
- 281 Other resource management
- 284 Feeding/watering
- 285 Nest structures
- 286 Population control
- 287 Stocking enhancements/population augmentation
- 288 Nuisance animal complaints
- 293 Mortality investigations
- 294 Program coordination and implementation C inter- and intra-agency coordination and program implementation at the section, bureau, or division level
- 296 Habitat protection technical assistance
- 750 URTD assessment
- 789 Site Preparation – GCR
- 790 Irrigation – GCR
- 791 Seed Collection – Hand
- 792 Seed Collection – Mechanical
- 793 Herbicide Maintenance Treatment

Administration

Central Office/Headquarters

- 100 ADMINISTRATION C administrative tasks, including preparation of forms, word processing, photocopying, filing, and other clerical/secretarial duties.
- 104 Budget/purchasing/accounting

Districts/Regions

See Location code

Units/Projects

See Location code

Support

Land Management Planning

- 103 Meetings C includes workshops, conferences, staff, and other meetings.
- 204 Resource planning

Land Management Reviews

- 209 Land Management Reviews
- 101 Project inspection C field inspections of projects.

Training/Staff Development

150 PERSONNEL MANAGEMENT C recruitment, hiring, training, counseling, and supervising.

Vehicle Purchase

- 128 New Vehicle and Equipment Purchase

Vehicle Operation and Maintenance

- 923 FEM C vehicles/equipment

Other

- 140 REPORT WRITING/EDITING/MANUSCRIPT PREPARATION
- 141 Grant applications
- 180 SYSTEMS ADMINISTRATION AND MANAGEMENT
- 182 Data management
- 184 Metadata development and management
- 187 IT
- 188 Web development
- 721 Geospatial analysis techniques
- 191 Stamp design coordination
- 226 Human dimensions surveys

Capital Improvements

New Facility Construction

- 910 New facility construction C buildings/structures
- 912 New construction C roads/bridges
- 913 New construction C trails
- 914 New construction C fences

Facility Maintenance

- 920 Facility and equipment maintenance (FEM) C buildings/structures
- 921 FEM C utilities
- 922 FEM C custodial functions
- 925 FEM C boating access
- 926 FEM C roads/bridges
- 927 FEM C trails
- 928 FEM C fences

Visitor Services/Recreation

Information/Education Programs

- 145 Technical bulletin

Operations

- 311 Boundary signs
- 312 Informational signs
- 320 Outreach and education C attending or developing educational or informational materials or events for the public
- 327 Becoming an Outdoor Woman C enhancement
- 331 Wings Over Florida
- 339 Range safety operations
- 341 Public use administration (hunting)
- 342 Public use administration (non-hunting)
- 350 Customer service support C disseminating written or verbal information or assistance to the public
- 700 STUDIES
- 740 EVALUATIONS AND ASSESSMENTS

Law Enforcement

FWC Activity Code Numeric Listing

- 100 ADMINISTRATION C administrative tasks, including preparation of forms, word processing, photocopying, filing, and other clerical/secretarial duties.
- 101 Project inspection C field inspections of projects.
- 103 Meetings C includes workshops, conferences, staff, and other meetings.
- 104 Budget/purchasing/accounting
- 128 New Vehicle and Equipment Purchase
- 140 REPORT WRITING/EDITING/MANUSCRIPT PREPARATION
- 141 Grant applications
- 145 Technical bulletin
- 150 PERSONNEL MANAGEMENT C recruitment, hiring, training, counseling, and supervising.
- 180 SYSTEMS ADMINISTRATION AND MANAGEMENT
- 182 Data management
- 184 Metadata development and management
- 185 GIS
- 186 Biometrics
- 187 IT
- 188 Web development
- 191 Stamp design coordination
- 194 Lake restoration
- 200 RESOURCE MANAGEMENT
- 201 Cultural resource management
- 202 Timber management
- 203 Tree and shrub planting
- 204 Resource planning
- 205 Prescribed burning
- 206 Prescribed burning C growing season (April 1 to September 30)
- 207 Prescribed burning C dormant season (October 1 to March 31)
- 208 Firebreaks
- 209 Land Management Reviews
- 210 Exotic species control
- 211 Exotic plant control (mechanical)
- 212 Exotic plant control (chemical)
- 213 Wildlife management
- 214 Listed Species management
- 215 Hydrology management
- 216 Dams, dikes, levees
- 217 Canals
- 218 Water level management
- 219 Upland restoration
- 221 Animal surveys

226	Human dimensions surveys
228	Inland aerial surveys
235	Vegetation and plant surveys
250	MONITORING AND ASSESSMENTS
252	Biomedical monitoring
253	Ecological monitoring
256	Habitat monitoring analysis
263	Nest box monitoring
264	Population demographics
275	Permits and authorizations
276	Commission rule development and review
277	Relocation
278	CITES tags
281	Other resource management
282	Herbaceous seeding
283	Clearings
284	Feeding/watering
285	Nest structures
286	Population control
287	Stocking enhancements/population augmentation
288	Nuisance animal complaints
289	Native vegetation management (mechanical)
290	Native vegetation management (chemical)
293	Mortality investigations
294	Program coordination and implementation C inter- and intra-agency coordination and program implementation at the section, bureau, or division level
295	Biological data collection, analysis, and reporting
296	Habitat protection technical assistance
311	Boundary signs
312	Informational signs
320	Outreach and education C attending or developing educational or informational materials or events for the public
327	Becoming an Outdoor Woman C enhancement
331	Wings Over Florida
339	Range safety operations
341	Public use administration (hunting)
342	Public use administration (non-hunting)
350	Customer service support C disseminating written or verbal information or assistance to the public
700	STUDIES
721	Geospatial analysis techniques 740 EVALUATIONS AND ASSESSMENTS
750	URTD assessment
789	Site Preparation – GCR
790	Irrigation – GCR
791	Seed Collection – Hand
792	Seed Collection – Mechanical

- 793 Herbicide Maintenance Treatment
- 910 New facility construction C buildings/structures
- 912 New construction C roads/bridges
- 913 New construction C trails
- 914 New construction C fences
- 920 Facility and equipment maintenance (FEM) C buildings/structures
- 921 FEM C utilities
- 922 FEM C custodial functions
- 923 FEM C vehicles/equipment
- 925 FEM C boating access
- 926 FEM C roads/bridges
- 927 FEM C trails
- 928 FEM C fences

12.17 Operation Plan Fiscal Year 2017-2018

Fiscal year 2017

Activity	Title	Man Days	Salary	FuelCost	Other	Total	Units
101	Project inspection	0	\$0.00	\$0.00	\$0.00	\$0.00	0
103	Meetings	5	\$1,089.90	\$42.50	\$500.00	\$1,632.40	0
104	Budget/purchasing/accounting	1	\$217.98	\$8.50	\$0.00	\$226.48	0
128	New Vehicle and Equipment Purchases	0	\$0.00	\$0.00	\$120,000.00	\$120,000.00	0
140	Report writing/editing/manuscript preparation	1	\$217.98	\$8.50	\$0.00	\$226.48	0
150	Personnel management	10	\$2,179.80	\$85.00	\$11,000.00	\$13,264.80	0
185	GIS	5	\$1,089.90	\$42.50	\$0.00	\$1,132.40	0
200	Resource Management	45	\$9,809.10	\$382.50	\$1,000.00	\$11,191.60	0
204	Resource planning	3	\$653.94	\$25.50	\$7,000.00	\$7,679.44	0
206	Prescribed burning - growing season	60	\$13,078.80	\$510.00	\$1,000.00	\$14,588.80	3000
207	Prescribed burning - dormant season	50	\$10,899.00	\$425.00	\$1,000.00	\$12,324.00	2500
208	Firebreaks	22	\$4,795.56	\$187.00	\$0.00	\$4,982.56	52
212	Exotic plant control (chemical)	10	\$2,179.80	\$85.00	\$310,000.00	\$312,264.80	0
221	Animal surveys	10	\$2,179.80	\$85.00	\$30,000.00	\$32,264.80	0
250	Monitoring and assessments	0	\$0.00	\$0.00	\$0.00	\$0.00	0
289	Native vegetation management (mechanical)	15	\$3,269.70	\$127.50	\$0.00	\$3,397.20	75
295	Biological data collection, analysis, and reporting	10	\$2,179.80	\$85.00	\$0.00	\$2,264.80	0
311	Boundary signs	1	\$217.98	\$8.50	\$0.00	\$226.48	0
312	Informational signs	1	\$217.98	\$8.50	\$500.00	\$726.48	0
341	Public use administration (hunting)	1	\$217.98	\$8.50	\$1,000.00	\$1,226.48	0
342	Public use administration (non-hunting)	1	\$217.98	\$8.50	\$0.00	\$226.48	0
350	Customer service support	1	\$217.98	\$8.50	\$0.00	\$226.48	0
920	FEM -- buildings/structures	2	\$435.96	\$17.00	\$2,385.00	\$2,837.96	4
921	FEM -- utilities	0	\$0.00	\$0.00	\$2,000.00	\$2,000.00	0
922	FEM -- custodial functions	5	\$1,089.90	\$42.50	\$2,000.00	\$3,132.40	0

Florida Fish and Wildlife Conservation Commission | Herky Huffman/Bull Creek Wildlife
Management Area Management Plan

923	FEM -- vehicles/equipment	15	\$3,269.70	\$127.50	\$40,000.00	\$43,397.20	0
926	FEM -- roads/bridges	10	\$2,179.80	\$85.00	\$230,000.00	\$232,264.80	8
928	FEM -- fences	1	\$217.98	\$8.50	\$0.00	\$226.48	0

12.18 Arthropod Control Plan



ADAM H. PUTNAM
COMMISSIONER

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

Section 388.4111, F.S.
Telephone: (850) 617-7995

Return to:
Mosquito Control Program
3125 Conner Blvd, Bldg 6,
Tallahassee, Florida 32399-1650

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. Fill this form out if control work is necessary or planned.

Name of Designated Land: Herky Huffman/Bull Creek Wildlife Management Area

Is Control Work Necessary:

☐ Yes

☒ No

Location: Osceola County

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?

N / A Please Check All That Apply: N/A

☐ Landing Rate Counts

☐ Light Traps

☐ Sentinel Chickens

☐ Citizen Complaints

☐ Larval Dips

☐ Other

If "Other", please explain: N/A

Arthropod Species for Which Control is Proposed: N/A

Proposed Larval Control: N/A

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 Larvaciding Applications: N/A

(Please Check All That Apply:)

☐ Bti

☐ Bs

☐ Methoprene

☐ Non-Petroleum Surface Film

☐ Other, please specify:

Please specify the following for each larvacide: N / A

Chemical or Common name: N/A

☐ Ground

☐ Aerial

Rate of application:

Method of application:

Proposed Adult Mosquito Control: N/A

Aerial adulticiding ☐ Yes ☒ No

Ground adulticiding ☐ Yes ☒ No

Please specify the following for each adulticide: N/A

Chemical or common name:

Rate of application:

Method of application:

Proposed Modifications for Public Health Emergency Control: In the event of a declared public health emergency, control may be performed by the arthropod control agency, as part of a larger treatment plan to safeguard public health. Land managers of the area will be notified prior to treatment.

Proposed Notification Procedure for Control Activities:

Manager of the area will be notified by e-mail when treatment of the area will occur. The notice should include a map of the area being treated, the material to be used and the general time of day the treatment will occur.

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.

None

Proposed Modification of Aquatic Vegetation:

None

Land Manager Comments:

Arthropod Control Agency Comments:

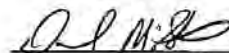
David B.
Johnson

Digitally signed by David B.
Johnson
DN: cn=David B. Johnson, o=ou,
email=David.Johnson@MYFWC.c
om, c=US
Date: 2018.11.05 14:00:23 -0500

11/5/18

Signature of Lands Manager or Representative

Date



Signature of Mosquito Control Director / Manager

10/25/18

Date

12.19 Osceola County Letter of Compliance with Local Government Comprehensive Plan



DEPARTMENT OF COMMUNITY DEVELOPMENT

Dave Tomek
Administrator

Joe Johnston
Deputy Administrator

Susan E. Caswell, AICP
Assistant Administrator

William Grimes
Building Official

Kelly Haddock
Current Planning Director

Ken Brown
Customer Care Director

Mahmoud Najda P.E.
Development Review Director

Joseph S. Strickland
Extension Services Director

Robert Mindick
Parks and Public Lands Director

Kerry Godwin
Planning & Design
Director

Susan E. Caswell, AICP
Sports & Event Facilities

**Osceola
County**

1 Courthouse Square
Suite 1100
Kissimmee, FL 34741
PH: (407) 742-0200
Fax: (407) 742-0206
www.osceola.org

sent via email: dylan.imlah@myfwc.com

March 6, 2019

Dylan Imlah
Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Land Conservation and Planning
620 South Meridian Street
Tallahassee, Florida 32399

Re: Herky Huffman/Bull Creek Wildlife and Environmental Conservation Area
Management Plan

Ms. Imlah,

We have received and reviewed the management plan for the Herky Huffman/Bull Creek Wildlife and Environmental Conservation Area and find the proposed management activities to be consistent with the policies of the Osceola County Comprehensive Plan and other statutes and regulations. The subject property is designated as Conservation use on the Future Land Use Map and is presently zoned Agricultural Development and Conservation. The properties in and around the Herky Huffman/Bull Creek Wildlife and Environmental Conservation Area are Rural Agricultural with an area to the east as a Rural Settlement, with the restriction that properties may be developed at no greater than one unit per five acres. The areas north of U.S. Highway 192 are indicated as Mixed Use Development in our Future Land Use Map which has a minimum density of five dwelling units per acre.

Osceola County is pleased that the conservation and preservation activities of the Florida Fish and Wildlife Conservation Commission are continuing and that the Commission continues to evaluate recreational opportunities at the Herky Huffman/Bull Creek Wildlife and Environmental Conservation Area. Osceola County supports the objectives outlined in the Management Activities and Intent policy 5.6 Public Access and Recreational Opportunities. These recreational opportunities enhance the quality of life for the residents of Osceola County through such activities as hiking and wildlife observation activities, fishing, boating/kayaking, bicycling, horse riding and camping. The County also looks forward to the contribution to the local economy through increased exposure of tourists to the resources of this diverse conservation area.

Please contact me if you have any questions or require any clarification of this information.

Sincerely,

A handwritten signature in black ink, appearing to read "Corrine Carpenter".

Corrine Carpenter, Principal Planner
c. Robert Mindick, Park and Public Lands Director

12.20 SJRWMD Governing Board Meeting Minutes for Plan Approval

Attachment



St. Johns River Water Management District

GOVERNING BOARD MEETING MINUTES

October 8, 2019
SJRWMD District Headquarters
4049 Reid Street
Palatka, FL 32177

Call to Order

Chairman Burnett called the Governing Board meeting to order at 11:03 a.m. and led the pledge of allegiance.

The agenda items were called in the following order: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 26, 27, and 28. For ease of reference, each item is listed below in numerical order.

Attendance

Present:
Doug Burnett (Chairman)
Ron Howse (Treasurer)
Doug Bournique
Daniel Davis
Susan Dolan

Governing Board Meeting

Agenda Item 1 For Information: Employee Service Awards.

5-YEAR SERVICE AWARDS

Courtney E. Rickett
Chemist II
Bureau of Water Resource Information

10-YEAR SERVICE AWARDS

Jodi B. Slater

Generated 10/11/2019 1:53 PM

Tuesday, October 8, 2019

Environmental Scientist IV
Bureau of Water Resources

20-YEAR SERVICE AWARDS

Mary E. Winkler, J.D.
Deputy General Counsel
Office of General Counsel

RETIREMENTS

Tina M. Spurlock
Procurement Supervisor
Office of Financial Services

Agenda Item 2. For Information: The Hydrologic Conditions Report.

Christine Mundy, chief, Bureau of Water Resource Information, gave a PowerPoint presentation describing the hydrologic conditions for September 2019. A copy of the presentation has been made a permanent part of the record.

Agenda Item 3. Consideration: Approval of Governing Board items recommended on the Consent Agenda for approval.

Items Recommended for approval on Consent Agenda by Chairman Burnett
Items 14 through 25 were recommended for approval on the Consent Agenda.

Board member Howse requested staff compare use of cemented coquina versus lime rock for roads.

A MOTION WAS MADE BY DANIEL DAVIS TO APPROVE THOSE ITEMS RECOMMENDED FOR APPROVAL ON THE CONSENT AGENDA, SECONDED BY DOUG BOURNIQUE. MOTION CARRIED UNANIMOUSLY.

Agenda Item 4. Consideration: Approval of ranking of project applications for the District-wide Agricultural Cost Share Program and authorization for the Executive Director to execute contracts with a cumulative dollar amount not to exceed \$1,564,791.

Suzanne Archer, technical program manager, Bureau of Water Supply Planning, gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

Speaker:
Tim Sallin, Cherrylake, Inc.

A MOTION WAS MADE BY DOUG BOURNIQUE TO APPROVE RECOMMENDATION, SECONDED BY SUSAN DOLAN. MOTION CARRIED UNANIMOUSLY.

Agenda Item 5. Consideration: Approval of the Bureau of Operations and Maintenance Fiscal Year 2019-20 Work Plan.

Tuesday, October 8, 2019

Amy Wright, supervising professional engineer, Bureau of Operations and Maintenance, gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

A MOTION WAS MADE BY RON HOWSE TO APPROVE RECOMMENDATION, SECONDED BY DOUG BOURNIQUE. MOTION CARRIED UNANIMOUSLY.

Agenda Item 6. Consideration: Approval of bid and contract award to the lowest responsible and responsive bidder for S96C Rehabilitation.

Gretchen Kelley, senior professional engineer, Bureau of District Projects and Construction, gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

A MOTION WAS MADE BY DOUG BOURNIQUE TO APPROVE RECOMMENDATION, SECONDED BY SUSAN DOLAN. MOTION CARRIED UNANIMOUSLY.

Agenda Item 7. Consideration: Approval of the Bid and Award to the lowest responsive and responsible bidder for the Lake Apopka North Shore Phase 4 Pump Station to reduce phosphorus discharge to Lake Apopka.

Bob Naleway, senior professional engineer, Bureau of District Projects and Construction, gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

A MOTION WAS MADE BY RON HOWSE TO APPROVE RECOMMENDATION, SECONDED BY DANIEL DAVIS. MOTION CARRIED UNANIMOUSLY.

Agenda Item 8. Consideration: Approval of the Florida Fish & Wildlife Conservation Commission's Land Management Plan for Herky Huffman Bull Creek Wildlife Management Area.

Brent Bachelder, land resource specialist, Bureau of Land Resources, provided a briefing of the item and introduced Dylan Imlah, Senior Conservation Planner, Florida Fish and Wildlife Conservation Commission. Ms. Imlah gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

A MOTION WAS MADE BY DOUG BOURNIQUE TO APPROVE RECOMMENDATION, SECONDED BY RON HOWSE. MOTION CARRIED UNANIMOUSLY.

Agenda Item 9. Consideration: Approval of the surplus and sale of 1.961 acres of SJRWMD-owned Gourd Island Conservation Area to FDOT.

Ramesh Buch, director, Real Estate Services Program, gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

A MOTION WAS MADE BY SUSAN DOLAN TO APPROVE RECOMMENDATION, SECONDED BY RON HOWSE. MOTION CARRIED UNANIMOUSLY.

Tuesday, October 8, 2019

Agenda Item 10. Consideration: Approval of an Amendment to the Conceptual Mitigation Plan for the Western Beltway, Part C Phase I ("Mitigation Plan") and the surplus and sale of the 13.01-acre Pine Street parcel in Orange County, Florida.

Diana Bankhardt, real property specialist, Real Estate Services Program, gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

A MOTION WAS MADE BY SUSAN DOLAN TO APPROVE RECOMMENDATION, SECONDED BY DANIEL DAVIS. THE MAJORITY VOTED IN FAVOR OF THE MOTION WITH RON HOWSE VOTING AGAINST. MOTION CARRIED.

Agenda Item 11. For Information: The FY 2018-2019 Inspector General Annual Report.

Presentation was not made to the Board due to Daniel Fanger, Inspector General, being called for jury duty. All information for the item was provided in the Governing Board packet.

Agenda Item 12. For Information: The FY 18-19 Land Management Review Team Annual Report.

Brent Bachelder, land resource specialist, Bureau of Land Resources, gave a PowerPoint presentation. A copy of the presentation has been made a permanent part of the record.

Agenda Item 13. For Information: Public Comment.

No speakers.

Consent Agenda

Agenda Item 14. Consideration: Approval of the minutes from the September 10, 2019 Governing Board Meeting and Tentative Budget Hearing, and September 24, 2019 Final Budget Hearing.

Approved (see agenda item #3).

Agenda Item 15. Consideration: Approval of the FY 2019-2020 Inspector General Audit Plan.

Approved (see agenda item #3).

Agenda Item 16. Consideration: Approval of Treasurer's Financial Report dated August 31, 2019. For information: Contract Information Report dated August 31, 2019 and Finance Committee Calendar for scheduling purposes.

Tuesday, October 8, 2019

Approved (see agenda item #3).

Agenda Item 17. Consideration: Approval of repeal and revisions to District policies which will not impact the District's current business practices.

Approved (see agenda item #3).

Agenda Item 18. Consideration: Approval of the bid and award of Purchase Orders to the lowest responsible and responsive bidders for the purchase of herbicides and related adjuvants for the District Invasive Plant Management Program for FY2019-2020.

Approved (see agenda item #3).

Agenda Item 19. Consideration: Approval of award of cattle grazing lease on Little Big Econ State Forest to John Vocelle d/b/a Krislaur Cattle Company, the highest responsible and responsive respondent.

Approved (see agenda item #3).

Agenda Item 20. Consideration: Approval of award of cattle grazing lease on Orange Creek South Restoration Area to Michael Cassels, the highest responsible and responsive Respondent.

Approved (see agenda item #3).

Agenda Item 21. Consideration: Approval of Actual Expenditures and Future Cost Estimates for the Coastal Oaks and First Coast Expressway Mitigation Projects.

Approved (see agenda item #3).

Agenda Item 22. Consideration: Approval of a no-cost time extension for Cost-Share Agreement 32377 with the City of Ocala for the Pine Oaks Wetland Recharge Park Project. The proposed revised completion date is July 31, 2020.

Approved (see agenda item #3).

Agenda Item 23. Consideration: Approve and authorize the Executive Director to execute the Release of Regulatory Conservation Easement in Exchange for Substitute Mitigation regarding Victoria's Place, Nassau County, Permit No. 40-089-56555-1.

Approved (see agenda item #3).

Agenda Item 24. Consideration: Approval of Consumptive Use Permit 50324-9, known as City of Ocala.

Tuesday, October 8, 2019

Approved (see agenda item #3).

Agenda Item 25. Consideration: Approval of staff's recommendation that the Governing Board extend the term of the two Temporary Consumptive Use Permits (Deseret Field Crops and Deseret Agronomic Crops) to allow water use for crop production while the Taylor Creek Reservoir settlement-related activities continue.

Approved (see agenda item #3).

Other Items and Reports

Agenda Item 26. For Information: Governing Board comments.

Chairman Burnett appointed Susan Dolan to the Central Florida Water Initiative (CFWI) Steering Committee.

Agenda Item 27. For Information: Executive Director's report.

- September Employee of the Month – Graham Williams
- October Employee of the Month – John Higman
- St. Johns River Forum, August 26
- Fulton Receives Florida Lake Management Society Award
- District Laboratory Assessment Success
- Lab / IT Work is WIN WIN

Agenda Item 28. For Information: Calendar of upcoming meetings.

November 11 District Holiday – Veterans Day

November 12 Governing Board Meeting
District Headquarters

Chairman Burnett stated he met with Noah Valenstein, Secretary, Florida Department of Environmental Protection (FDEP) and commended staff on the work that has been done.

Meeting adjourned at 12:25 p.m. - no conflicts declared

Signed by Doug Burnett, Chairman

Signed by Ann B. Shortelle, Secretary

A copy of the original signed document can be obtained by contacting the District Clerk at clerk@sjrwmd.com or 386-329-4127.