

13.9 FWC Apiary Policy

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.

1

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.

2

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 is becomes available on a WMA/WEA and there are beekeepers on the waiting list interested in that particular area, those individuals meeting the criteria above will be given preference. If there is more than one beekeeper meeting the criteria with their name on the list then a random drawing will be held by the THCR Contract Manager to determine who will receive the site. Beekeepers on the waiting list will be notified in writing of the random drawing's date/location and will be invited to attend. The individual's name selected during this drawing will be awarded the contract.

Apiary agreements are non-transferable. Each agreement serves as a contract between a specific individual or company and FWC, and the rights and responsibilities covered by an individual agreement cannot be transferred.

Contracts

Apiary contracts are for five (5) years and renewals are contingent upon a satisfactory performance evaluation by Area Biologist and concurrence of the THCR Section Leader. Approval is based on apiarist performance, adherence to rules and regulations and general cooperation. If an Area Biologist decides an apiarist whose contract is expiring is unacceptable he may recommend not approving the new contract. If this transpires then the wait list process using random selection will be used. If there is no apiarist on a current wait list then the apiarists who are in good standing with existing contracts will be notified to see if any want to be put on the wait list for the drawing. If none are interested then the site will be put on hold pending a valid request.

Pricing of Apiary Site(s)

Cost of each apiary site will be \$40 annually which will include up to 50 beehives. Additional beehives will be charged at the rate of \$40 per 50 beehives.

Pricing examples:

- A beekeeper is leasing 2 apiary sites with up to 100 beehives - the fee per year is \$80.
- A beekeeper is leasing 3 apiary sites with up to 200 beehives - the fee per year is \$160.

Note: The maximum number of hives/colonies allowed on an apiary site will be at the discretion of the apiarist. However, the apiarist is strongly recommended to follow the BMP as recommended by the FDACS/DPI. In addition to providing the BMP, FDACS/DPI's management has recommended 50 hives per site in pineland communities and no more than 100 hives per site in areas with bountiful resources. However, FWC will not dictate the number of hives on a site unless they create land management issues.

Bear Depredation Control at Apiary Site(s)

Beekeepers are required to consult with the WMA/WEA Area Biologist to see if electric fencing is required for their apiary sites. If the Area Biologist requires electric fencing then the

Beekeeper shall construct and maintain electric fences for each apiary site. Numerous electric fence designs have been used to varying success and FWC as a courtesy provides an electric fence technical information bulletin with each Agreement. This bulletin is attached in order to assist the Beekeeper and/or provide a design that has been proven to be reasonable effective.

SUBJECT MATTER REFERENCES

Apiary Inspection Law - Chapter 586, Florida Statutes (see <http://www.leg.state.fl.us/Statutes/>), Rule Chapter 5B-54, Florida Administrative Code (see www.flrules.org).

The Board of Trustees of the Internal Improvement Trust Fund – Recommended Apiary Agreement Guidelines For Apiaries & Revisions to an Agreement for Apiary Activities on State Lands on September 23, 1986
S:\HSC\THCR\APIARY.BACKUP.POLICY\dlissupport@dos.state.fl.us_20100903_111446.pdf

Senate Resolution 580, September 21, 2006: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_bills&docid=f:sr580ats.txt.pdf

Attachments

Sample Apiary Agreement W/Attachments (Map Placeholder & Electric Fence Bulletin)

Sample Apiary Site Application Form W/Mission Statement

Best Management Practices for Maintaining European Honey Bee Colonies

Sample of Random Selection Process Procedure

APPROVED:

Division Director or Designee

DATE: _____

APIARY AGREEMENT

AGREEMENT FOR APIARY ACTIVITIES ON STATE LANDS

THIS AGREEMENT is made by and between the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600, hereinafter known as “the COMMISSION,” and (Insert Name and Address of Apiarist Here), telephone number (Insert Phone Number of Apiarist Here), hereinafter known as “the USER.”

WITNESSETH

In consideration of the mutual promises to be kept by each and the payments to be made by the USER, the parties agree as follows:

1. TERM: This Agreement will begin (Insert date here) or the date signed by both parties, whichever is later, and will end five (5) years from the date of execution. Issuance of a new five (5) year Agreement is contingent upon satisfactory performance evaluation by the Area Biologist and approval of the THCR Section Leader.
2. The COMMISSION Agrees:
 - a. To provide apiary sites on state lands, which will be identified by the COMMISSION staff and located on the property identified in (4)(f) below.
 - b. To provide technical assistance for bear-proofing, if required by Area Biologist, of sites made available under this Agreement.
 - c. To allow the USER to place a total number of (insert number of hive boxes here) hive boxes on the COMMISSION-managed property at the apiary site(s).
3. The USER Agrees:
 - a. To pay (Insert Total Dollars Here) on or before the execution date of this Agreement and each year thereafter on or before anniversary date of the original contract execution date, with check or money order payable to the Florida Fish and Wildlife Conservation Commission. All payments shall be remitted to The Florida Fish and Wildlife Conservation Commission, Finance and Budgeting, Accounting Section, PO Box 6150, Tallahassee, FL 32399-6150, and a copy of the check to The Florida Fish and Wildlife Conservation Commission, Terrestrial Habit Conservation and Restoration Section, Attn: Section Leader, 620 South Meridian Street, Tallahassee, Florida 32399-1600.

- b. To have no more than (Insert Number of Hive boxes here) hive boxes on the property at one time.
- c. To comply with the Florida Honey Certification and Honeybee Law, Chapter 586, Florida Statutes, and Rule 5B-54, Florida Administrative Code, and all other applicable federal, state, or local laws, rules or ordinances.
- d. To not damage, cut or remove any trees in the course of preparing for or conducting operations under this Agreement.
- e. To repair within 30 days of occurrence any damage to roads, trails, fences, bridges, ditches, or other public property caused by USER'S operations under this Agreement based on discretion of the COMMISSION to ensure the WMA/WEA management goals are met. All repairs will be coordinated with the Area Biologist to ensure management goals are met. If USER does not comply within the 30 day requirement, then the COMMISSION may use a third party to perform the repairs and charge the USER accordingly.
- f. To report any forest fires observed and to prevent forest fires during the course of operations under this Agreement.
- g. To abide by all WMA/WEA rules and regulations in addition to items in this Agreement.
- h. To notify the Area Biologist within 24 hours when a bear depredation event occurs.
- i. To post their name in an agreed upon location at each site covered by this Agreement or otherwise use an identifying system that is approved by the Area Biologist.
- j. To furnish proof of general liability insurance prior to starting apiary activities on state property or within 30 days of execution of this Agreement, whichever is earlier, and proof of annual renewal of the general liability insurance policy prior to or upon expiration date of the policy. The USER shall maintain continuous general liability insurance throughout the term of this Agreement for no less than \$300,000 for bodily injury and \$100,000 for property damage for each occurrence. Such a policy shall name the COMMISSION as the Certificate Holder. The USER's current certificate of insurance shall contain a provision that the insurance will not be canceled for any reason during the term of this Agreement except after thirty (30) days written notice to the COMMISSION.

- k. To be liable for all damage to persons or property resulting from operations under this Agreement, and to release, acquit, indemnify, save and hold harmless the COMMISSION, its officers, agents, employees and representatives from any and all claims, losses, damages, injuries and liabilities whatsoever, whether for personal injury or otherwise, resulting from, arising out of or in any way connected with activities under this Agreement or activities occurring from any other source not under this Agreement and the USER further agrees to assume all risks of loss and liabilities incidental to any natural or artificial condition occurring on state lands cover by this Agreement.
- l. To construct and maintain electric fences, if required by the Area Biologist at the Area Biologist's discretion, to provide protection of apiaries from black bear depredation consistent with the technical information bulletin attached to this agreement, and, if so required, to maintain an open buffer around the fencing of five (5) feet or more. (See Attachment 1)
- m. To remove all personal property from the site within thirty (30) days of termination or expiration of this Agreement. The USER understands that after this time, all the USER'S personal property remaining on the WMA/WEA shall be deemed abandoned and become the property of the COMMISSION, which will be utilized or disposed of at the sole discretion of the COMMISSION, and that reasonable storage and/or disposal fees and/or costs may be charged to the USER.

4. The parties mutually agree:

- a. This Agreement is not transferable.
- b. The USER's failure to submit payment by the due date established herein may result in cancellation of the Agreement by the COMMISSION.
- c. The USER's failure to submit proof of general liability insurance or proof of annual renewal in compliance with (3) (j) above may result in cancellation of this Agreement by the COMMISSION.
- d. This Agreement shall be in effect for a period of five (5) years and issuance of a new agreement will be contingent upon a satisfactory performance evaluation and approval of the Area Biologist and THCR Section Leader.
- e. Each apiary site shall be situated so as to be at least one-half (1/2) mile inward from state property lines and there shall be at least one (1) mile separation between sites. Exceptions to this rule must be reviewed by Area Biologist

presented to and approved by the Terrestrial Habitat Conservation and Restoration Section Leader.

- f. The property covered by this Agreement is described as follows: That the property sites (Insert Area Name) Wildlife Management Area are represented by Attachment 2.
- g. In accordance with Section 287.134, Florida Statutes, an entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal or reply on a contract to provide goods or services to any public entity; may not submit a bid, proposal or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant with any public entity; and may not transact business with a public entity.
- h. As part of the consideration of this Agreement, the parties hereby waive trial by jury in action brought by either party pertaining to any matter whatsoever arising out of or in any way connected with this Agreement. Exclusive venue for all judicial actions pertaining to this Agreement is in Leon County, Florida.
- i. This Agreement may be terminated by the COMMISSION upon thirty (30) days written notice to the USER in the event the continuation of the apiary activities are found to be incompatible with the COMMISSION'S management plans or for any other reason at the sole discretion of the COMMISSION.

This Area Intentionally Left Blank

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

USER SIGNATURE

Date: _____

Witness

Witness

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

Mike Brooks, Section Leader
Terrestrial Habitat Conservation and
Restoration

Date: _____

Approved as to form and legality

Commission Attorney

Date: _____

AGREEMENT
ATTACHMENT 1

**Use of Electric Fencing to Exclude Bears
And Prevent Property Damage**

Florida Fish and Wildlife Conservation Commission
Technical Information Bulletin (2001)

Electric fencing has proven effective in deterring bears from entering landfills, apiaries (beehives), livestock pens, gardens, orchards, and other high-value properties. Numerous electrical fence designs have been used with varying degrees of success. Design, quality of construction, and proper maintenance determine the effectiveness of an electric fence. The purpose of this technical bulletin is to assist the property owner in understanding and implementing electrical fencing as a tool to exclude and prevent damage caused by black bears.

Understanding Electric Fencing

Electric fencing provides an electrical shock when an animal comes into contact with the electrically charged wires of the fence. People unfamiliar with electric fencing often are afraid that it will injure, permanently damage, or kill an individual or pet that contacts the fence. **This is not true!** A properly constructed electric fence is safe to people, pets, and bears.

Components of Electric Fencing

An electric fence is composed of four main elements: a charger, fence posts, wire, and the ground rod.

Fence Charger. On a small scale electric fence (like that typically needed for bear exclusion), the largest cost is normally the fence charger. A fence charger's job is to send an electrical pulse into the wire of the fence. Contrary to popular belief, there is not a continuous charge of electricity running through the fence. Instead the charger emits a short pulse or burst of electricity through the fence. The intensity and duration of the electrical pulse varies with the type of charger or controller unit. Chargers with a high-voltage, short duration burst capacity are the best because they are harder to ground out by tall grass and weeds. These types are also the safest, because, even though the voltage is high (5 kilovolts) the duration of the burst is very short (2/10,000 of a second) (FitzGerald, 1984).

Two basic energy sources for chargers are batteries (12-volt automotive type) and household current (110 volt). Battery-type chargers are typically cheaper to purchase but require more maintenance because of the necessity of charging the battery. The advantage of a battery powered charger is that it can be used in a remote location where 110-volt current is not available. Most units that are powered by a fully charged 12-volt deep-cycle batteries can last three weeks before needing a charge. Addition of a solar trickle charger will help prolong the duration of effective charge in 12-volt batteries.

Fence Posts. On small scale fences, the posts are normally the second largest expense involved in construction. Therefore, when planning an electric fence it is a good idea to utilize existing fencing in order to save money. If no existing fence is available, posts will need to be placed around the area needing protection. Posts may be wood, metal, plastic, or fiberglass. Wood and metal posts will need to have plastic insulators attached to them which prevent the electric wire from touching the post causing it to ground out. Plastic and fiberglass posts do not need insulators, the wire may be affixed directly to these posts. Wood and metal posts are typically more expensive and require the added expense of insulators, however, they are more durable and generally require less maintenance.

Wire. Fourteen to seventeen gauge wire is the most common size range used in electric fencing. Heavier wire (a lower gauge number) is more expensive but carries current with less resistance and is more durable (FitzGerald, 1984).

The two most common types of wire are galvanized and aluminum. Galvanized wire is simply a steel wire with a zinc coating to prevent rust, which makes the wire last longer. Some wire is more galvanized than others. The degree or amount of zinc coating that is around the core steel wire is measured in three classes. A class I galvanization means the wire has a thinner coating of zinc than a class II galvanization. Class III galvanized wire has the heaviest zinc coating and will last longer than the class I and class II wire (FitzGerald, 1984). In general, the cost of galvanized wire increases as the class or amount of galvanization increases.

Aluminum wire is typically more expensive than the galvanized wire. Some advantages of aluminum wire are: it will not rust, it conducts electricity four times better, and it weighs one-third less than steel wire.

The Ground Rod. The ground is an often overlooked, but critical part of an electric fence. Without a good ground, electricity will not flow through the wire. When an animal touches a charged wire, the body of the animal completes the electrical circuit and the animal feels the "shock". The current must travel from the charger through the wire to the animal and then back through the ground to the charger if the animal is to feel the shock. The soil acts as the return "wire" (ground) in the circuit. However, if a

bird was to land on a charged wire without touching the soil the bird would not complete the circuit and would be unaffected (FitzGerald, 1984). Some fence configurations use actual grounded wires within the fence to enhance the grounding system.

The ground may be a commercial ground rod or a copper tube or pipe driven six to eight feet in moist soil. Copper is expensive, so a copper coated steel pipe or any other good conducting metal pipe will work also. Very dry soil can effect the ability to create a good ground and has sometimes been a problem during drought conditions. Pipe may be a better choice than a solid rod during drought conditions, because water may be poured down the ground pipe to improve the ground. Some fence configurations use wires as the grounding system, rather than relying solely on the soil as a ground.

Recommended Electric Fence to Deter Black Bears

Conditions at fence sites will vary and will determine what the most effective fence configuration will be. Commission biologists welcome the opportunity to visit sites and provide custom tailored advice on constructing an effective electric fence. The following recommendation will cover most situations with low to moderate pressure from black bears. Use a five strand aluminum wire fence that is 40 inches high with wire spacing every eight inches apart using the previously mentioned wired grounding system (see Figure 1). The wire closest to the ground level (the lowest wire) should be a charged or "hot" wire. The second wire should be grounded. The third wire should be hot. The fourth wire should be grounded and the fifth wire should be hot. If using metal or wood posts, insulators must be used to keep the hot wires from grounding out. The cost of this type of electric fence utilizing fiberglass posts and a 110 volt fence charger is approximately \$200 for a 40' x 40' area (160 linear feet of fence).

Materials:

- 1 - 1, 312 foot roll (1/4 mile) 14 gauge aluminum electric fence wire
- 1 - 50 foot roll 12 gauge insulated wire
- 20 - 5 foot 5/8 inch dia fiberglass fence posts
- 5 - plastic gate handles
- 1 - 110 volt fence charger
- 1 - 10 foot ground pipe
- 4 - plastic electric fence signs

Installation. These instructions are for a square shape fence exclusion, but the process would be very similar for other applications. Drive 4 corner posts 1-foot deep into ground and stake with guy wires. Clip, rake, and keep clear any vegetation in a 15-inch wide strip under the fence and apply herbicide. Attach and stretch the aluminum wire at 8-inch increments starting 8 inches from ground level. A loop of wire should be left on each wire at the first corner post. Once the wire has been stretched around the outside of all the corner posts back to the first post a plastic gate handle should be attached to each wire and the gate handles should be attached to each

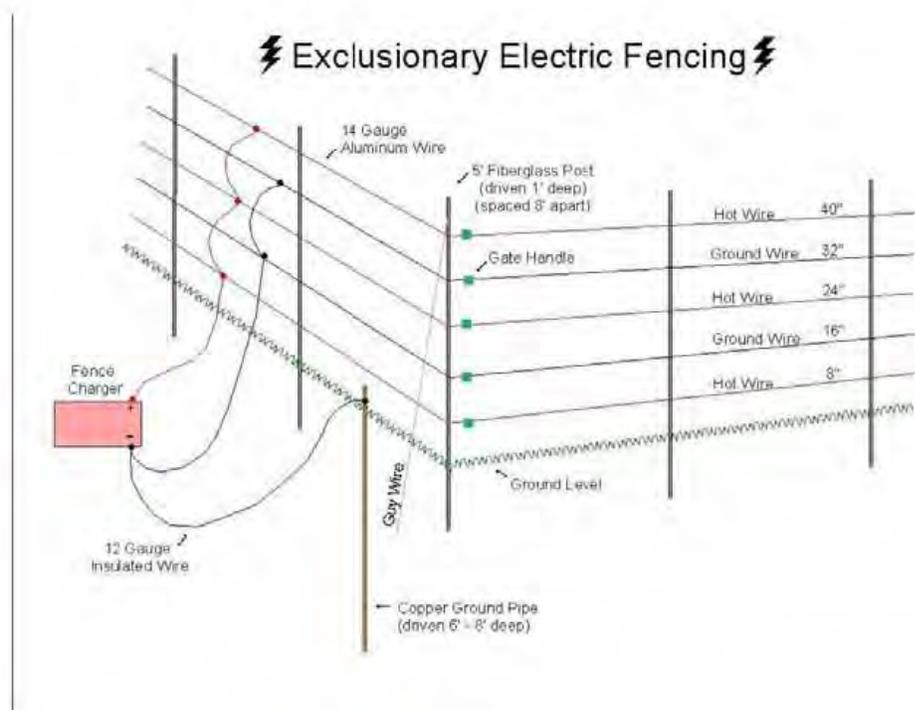
corresponding loop on the first corner post. Drive in the remaining 16 posts to the same depth at 8-foot intervals between corner posts. Secure each of the five wires to each of the posts with additional wire. Attach four plastic electric fence signs (one on each side) to the top wire of the fence. Attach a 12-gauge strand of insulated wire to the positive terminal of the fence charger and attach it to the first, third, and fifth wires of the fence. Attach another 12 gauge insulated wire to the negative terminal of the charger and attach this wire to the ground pipe which has been driven into the ground 6 to 8-feet deep. Attach another 12 gauge insulated wire from the negative terminal of the charger to the second and fourth wires on the fence. Plug the charger into a 110 volt power supply and the fence is in operation.

Tips to improve the effectiveness of your electric fence to deter black bears:

1. If using a 12-volt fence charger, ensure that the battery is charged; check every two weeks.
2. Make sure terminals on the charger and battery are free of corrosion.
3. Make sure hot wires are not being grounded out by tall weeds, fallen tree branches, broken insulators, etc.
4. If fence wires have been broken and repaired, make sure wires are corrosion free where they have been spliced together. Also, tighten the fence at each corner post as wires that have been spliced and are loose make poor connections.
5. Be sure to rake vegetation from under and around the outside of the fence as this may act as an insulator.
6. To improve the ground around the perimeter of the fence add a piece of 24 inch chicken wire laying on the ground around the outside of the fence. This should be connected to ground.
7. During periods of drought pour water down the ground pipe and around the ground pipe to improve the ground. Digging a 6 inch deep 6 inch diameter hole around the ground pipe and back filling with rock salt will also improve the ground. Additional ground pipes may also be added to portions of the fence farthest from the charger.
8. To ensure that the bear solidly contacts the charged portion of the fence, a bait like bacon strips, a can of sardines, or tin foil with peanut butter may be attached to one of the top hot wires. Make sure these do not contact the ground, thus shorting out the fence.
9. When protecting a specific structure (like a shed or rabbit hutch), the fence should be placed 3 to 5 feet away from the structure (rather than on it) so that the bear encounters the fence before reaching the attractant.
10. Protect the fence charger from the elements by covering it with a plastic bucket or a wooden box.
11. Place plastic electric fence signs around the perimeter of your fence to improve visibility and to warn other people.

LITERATURE CITED

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



AGREEMENT
ATTACHMENT 2

Place Holder for Map

Of

Apiary Locations

At

WMA/WEA

APIARY SITE APPLICATION FORM

Florida Fish and Wildlife Conservation Commission

RETURN TO: The Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600. Please print or type all information. Attach additional sheets if necessary.

Name _____ Telephone Number _____

Mailing Address _____

City or Town _____ County _____ Zip Code _____

Physical Address (If Different from Mailing Address) _____

Company Name: _____

Email Address _____

Requested Wildlife Management or Wildlife and Environmental Area(s) (see attached list of WMA/WEAs with apiary sites):

WMA/WEA _____ County _____ # of Sites _____

WMA/WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

Planned Number of Hives Per Site: _____ Permanent: ____ Seasonal: ____

Member of Beekeepers Association: Yes ____ No ____

Number of Years a Member _____

Name of Beekeepers Association: _____

Are you registered with Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI): ____ Yes ____ No ____ N/A If yes, please provide proof.

Are you current with any and all special inspection fees: ____ Yes ____ No ____ N/A. If yes, please provide proof.

Do you follow all recommended Best Management Practices from FDACS/DPI?: ____ Yes ____ No

If no, then please explain on a separate piece of paper.

Please provide below a chronological history of your beekeeping experience. If you need more space, please provide additional sheets:

References: If a new apiary contractor, please provide on a separate piece of paper at least 3 references who can verify your apiary experience. Provide each reference's name, address, phone number and email address (if applicable). Please attach reference sheet to this document and submit.

19

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.

**13.10 Cultural Resources of the GRWMA and Management
Procedures Guidelines - Management of Archaeological and
Historical Resources**

Environmental Resource Analysis

Cultural Resources of Guana River WMA

Cultural Resources										
Florida Sites										
SITE NAMES	SITEIDS	SITETYPE1	SITETYPE2	SITETYPE3	SITETYPE4	SITETYPE5	SITETYPE6	HUMANREMN	SArea	Percent of Area
BOOTH LANDING	SJ00050	Artifact scatter-low density (< 2 per sq meter)							6.84	0.07 %
BRITISH DIKES	SJ03254	Agriculture/Farm structure	Water control structure or dam						5.18	0.06 %
CAPO CREEK	SJ00072	Prehistoric shell midden	Prehistoric midden(s)						39.84	0.44 %
Cattle Dip	SJ04987	Land-terrestrial							0.42	0 %
Coquina	SJ04802	Historic well							0.27	0 %
COQUINA BLOCK	SJ03243	Building remains	Habitation (prehistoric)			Artifact scatter-dense (> 2 per sq meter)			0.88	0.01 %
GUANA LAKE EAST	SJ03244	Campsite (prehistoric)	Prehistoric midden(s)			Artifact scatter-dense (> 2 per sq meter)			0.62	0.01 %
GUANA RIVER	SJ02463	Prehistoric shell midden							20.34	0.22 %
GUANA RIVER SHELL RING	SJ02554	Subsurface features are present	Habitation (prehistoric)	House	Lake/Pond-lacustrine	Land-terrestrial	Prehistoric shell midden	YES	4.68	0.05 %
GUANA SHELL MIDDEN	SJ03151	Prehistoric shell midden							8.15	0.09 %
HUNTER'S FIND	SJ03485	Land-terrestrial	Prehistoric midden(s)					YES	0.26	0 %
JENKS LANDING	SJ00038	Artifact scatter-low density (< 2 per sq meter)							0.57	0.01 %
MCNEIL POND EAST	SJ03253	Campsite (prehistoric)	Prehistoric midden(s)			Artifact scatter-dense (> 2 per sq meter)			4.81	0.05 %
NN	SJ02556	Prehistoric shell midden							4.14	0.05 %
NN	SJ02555	Historic burial(s)	Land-terrestrial	Prehistoric burial mound(s)	Prehistoric shell midden	Prehistoric shell mound(s)		YES	3.29	0.04 %
NN	SJ02553	Prehistoric shell midden							1.50	0.02 %
NN	SJ02557	Prehistoric shell midden							2.34	0.03 %
NN	SJ02559	Prehistoric shell midden							13.69	0.15 %
NN	SJ02558	Prehistoric shell midden	Historic refuse / Dump						5.64	0.06 %
NORTH FIRE CUT	SJ03242	Building remains	Habitation (prehistoric)			Variable density scatter of artifacts			0.91	0.01 %
OLD SAW MILL	SJ02464	Lumber mill							3.89	0.04 %
PALM VALLEY	SJ00037	Land-terrestrial	Prehistoric burial mound(s)	Prehistoric mound(s)				YES	0.60	0.01 %
SUGAR MILL	SJ03255	Mill of unspecified function	Artifact scatter-dense (> 2 per sq meter)						0.42	0 %
THREE	SJ03486	Prehistoric shell							0.05	0 %

MILE	midden				TOTAL:	129.36	1.42 %
Florida Structures							
No Records Found							
Historical Cemeteries							
SITE NAME	SITEID	Total Area (acres)		Percent of Area			
BOOTH CEMETERY	SJ03240	1.08		0.01 %			
	TOTAL:	1.08		0.01 %			
Historic Bridges							
No Records Found							
National Register of Historic Places							
No Records Found							
Resource Groups							
SITE NAME	SITEID	Total Area (acres)		Percent of Area			
County Road 210	SJ05270	0.45		0 %			
	TOTAL:	0.45		0 %			
Field Survey							
TITLE		Total Area (acres)		Percent of Area			
An Archaeological Site Survey of Guana Lake, Within the Guana River Wildlife Management Area and Guana River State Park		1,101.00		12.05 %			
A Cultural Resource Assessment Survey of the Sanchez Grant Tracts and Plantation Annex, St. Johns County, Florida		3.17		0.03 %			
Cultural Resource Survey of the Palm Valley Bridge Vicinity, St Johns County, Florida		0.44		0 %			
A Cultural Resource Assessment Survey of the Grove North Tract, St. John's County, Florida		0.99		0.01 %			
A Cultural Resource Assessment Survey of the Magnolia Hammock Tract, St. Johns County, Florida		3.18		0.03 %			
Archaeological Testing at the South Beach Access Parking Facility, Guana River State Park, St. Johns County, Florida		13.32		0.15 %			
An Intensive Cultural Resource Assessment Survey and Testing in a Portion of 8SJ14, River Oaks Tract, St. Johns County, Florida		0.36		0 %			
Historic Properties Survey, St. Johns County, Florida		9,139.12		100 %			
Phase I Cultural Resource Survey of A1A		0.25		0 %			
The Guana Shell Ring		8.11		0.09 %			
An Archaeological and Historical Survey of the Palm Valley Tower Location in St. Johns County, Florida		285.80		3.13 %			
Habitat Enhancement Project for McNeil's Pond Guana River Wildlife Management Area, St. Johns County, Florida		32.08		0.35 %			
Guana River WMA, GRWMA Equestrian Area Roscoe Improvements		0.00		0 %			
TOTAL:		10,587.81		115.85 %			

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

13.11 GRWMA Prescribed Burning Plan

Guana River WMA Prescribed Burning Plan

INTRODUCTION

Fires in general have been an important part in the composition of Florida's ecosystem for many years. Many natives using fire to their advantage as agricultural tools along with historical lightning strikes coupled with minimal fire suppression, has developed and maintained a fire-dependant plant community in the southeast. The lack of fire can change an open canopy pine savanna into a densely closed hardwood hammock. This change results in undesirable conditions for species that rely on fire (Gilliam and Platt 1999).

The suppression of today's lightning-sparked wildfires is intended for the safety of the public and not the integrity of Florida's ecosystem, however in order to continue the overall effects of fire, prescribed fires are conducted. Intentionally started under favorable conditions, these fires mimic "natural" fires, but are strategically planned and controlled.

Resource managers in Florida rely on prescribed burning as an important land management tool. Prescribed burning is used for habitat improvement and manipulation, fuel reduction, disease and insect control, and site preparation. It is a recommended tool for management of such game animals as white-tailed deer (*Odocoileus virginianus*), bobwhite (*Colinus virginianus*), mourning dove (*Zenadia macroura*), and wild turkey (*Meleagris gallopavo*) (U.S. Forest Service 1969, Stoddard 1971). The value of prescribed fire to these and other animals, such as raptors and some songbirds, are well documented (Engstrom 2002). Prescribed fire benefits wildlife by reducing underbrush density, thus improving access, promoting the growth of succulent vegetation and lowering browse to feeding height of deer. Aesthetic values are also enhanced by the growth and fruiting of important wildlife food plants, such as dewberries (*Rubus spp.*) and blueberries (*Vaccinium spp.*) (Smith 2000).

BURN OBJECTIVES

Prescribed fire will be used on Guana River WMA 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 Guana River WMA is to restore and or maintain fire-dependent native habitat communities. This will result in preserving native plant communities including restoration of native groundcover while simultaneously improving wildlife habitat. The benefits derived from prescribed burning on Guana River WMA include not only long term preservation of native plant communities and improved wildlife habitat but numerous others as well:

- 1) Reduction of fuel loads, which will help to prevent or mitigate effects of wildfires.
- 2) Enhancement of the areas aesthetics by controlling undesirable vegetation.
- 3) Control of exotic plant species.
- 4) Improved public access.

DESCRIPTION OF AREA

Guana River WMA is approximately 10 miles north of St. Augustine and 15 miles south of Jacksonville. It is bordered by Highway A1A on the east, and the Atlantic Intracoastal Waterway on the West, County Road 210, Mickler Cut-off Road and private land on the north, and Guana Tolomato National Estuarine Research Reserve on the south.

The WMA contains 1,919 acres of pine flatwoods. Various natural communities such as wetland depressional areas and scrub interspersed throughout are not delineated. Approximately one-third of the flatwoods contains naturally regenerated pines. The overstory contains various stocking rates and age classes. Most of the pine stands occur centrally and run the length of the area, although some are adjacent to Guana Lake and maritime forest (Figure 1). Some pine stands occur on spoil islands and along the salt marsh bordering the Atlantic Intracoastal Waterway. Topography is nearly level except for remnant dune sites and low, wet depressions and drainages interspersed throughout.

Slash pine (*Pinus elliotii*) is the major species on the area; however, pond pine (*P. serotina*), sand pine (*P. palustris*), and loblolly pine (*P. taeda*) may also occur. Understory vegetation is dominated by saw palmetto (*Serenoa repens*) and gallberry (*Ilex glabra*), with grasses, sedges, and hardwood brush intermixed.



Figure 1. Guana River Wildlife Management Area, St. Johns County, Florida Habitat types.

PRESCRIBED BURNING PROGRAM

A. Firelines

Natural features (e.g., roads, creeks, rivers, and ponds) and existing roads are used as firelines when possible. Many of the less used roads that are utilized as firebreaks have re-vegetated over the years and therefore, disking or grading is required annually to maintain functional firebreaks.

B. Size and Arrangement of Compartments

Fifty-eight compartments have been delineated throughout Guana River WMA, averaging 46 acres in size (range: 14.0-77.4; Figure 2). Many compartments are smaller than desired; however, the north-south orientation of the area makes this unavoidable due to the desired interspersion and rotation of burned and unburned habitat. Compartment rotation provides an interspersion of burned and unburned areas, thus increasing habitat diversity and amount of edge. The preferred prescribed burn interval based on vegetative characteristics and availability to burn on Guana River WMA is approximately 2-3 years for flatwoods, 3-5 years for wetlands, and 4-7 years for scrub. Burn units will be burned in a mosaic pattern, thus increasing habitat diversity and escape cover for desired wildlife. Figure 3 shows management units relative correlation to the years since last burned.



Figure 2. Prescribed burn compartments on the northern most half of Guana River Wildlife Management Area.



Figure 2. Continued

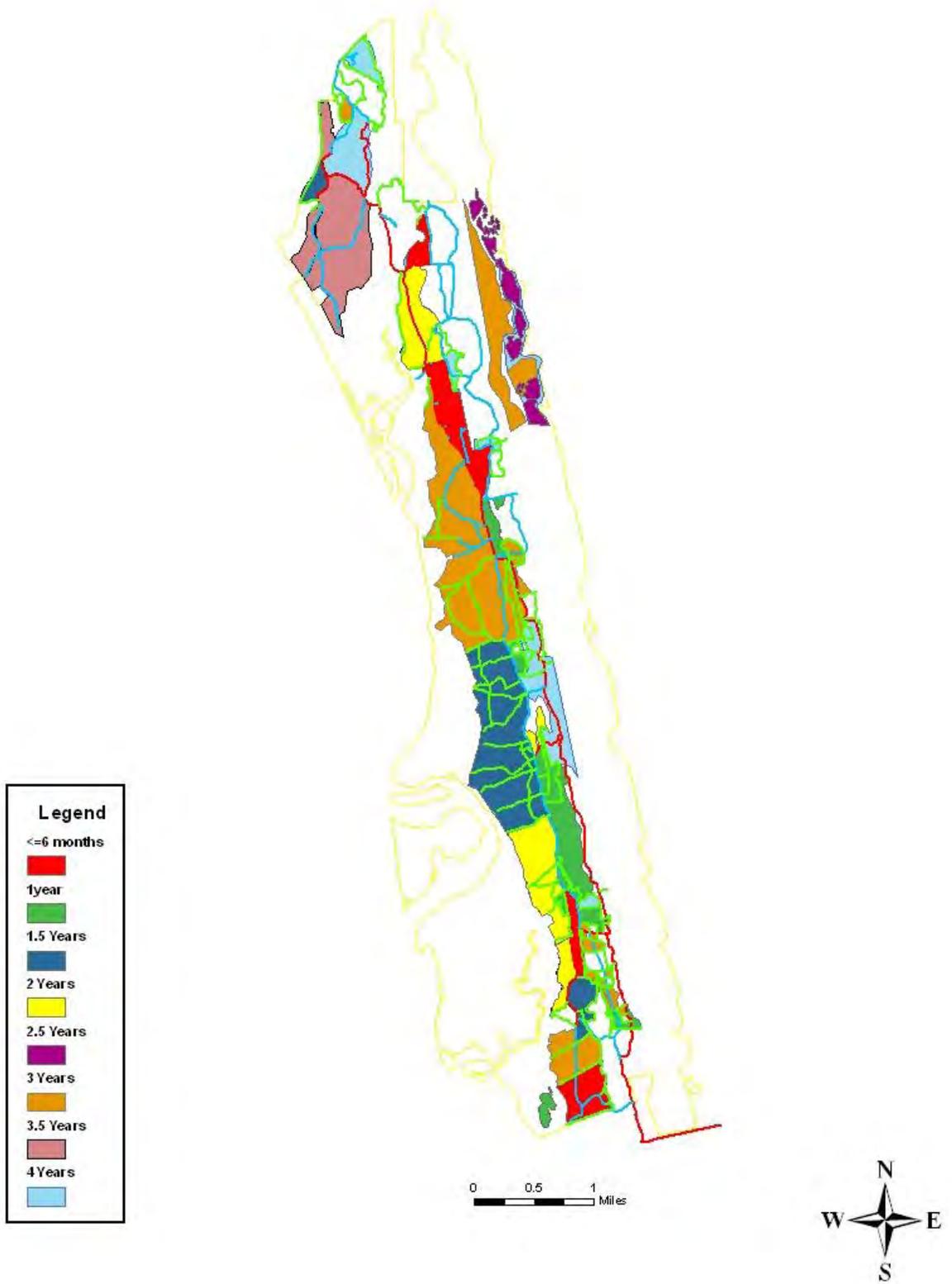


Figure 3. The years since last burned on Guana River Wildlife Management Area, 2014.

C. Type of Burn

Most of the burns on Guana River WMA will begin with a backing fire downwind side of the burn unit. The remaining of the unit will be burned using appropriate fire techniques relative to burn objectives, weather conditions, fuel loads, and fire intensity. Spot, flank, and strip head fires are the most common ignition patterns that will be used dependant on fuel loads. Although rarely used, aerial ignition is another ignition pattern that allows large acreage to be burned in a short amount of time.

D. Season and Time of Day

Burns will be conducted when weather permits during both the growing and dormant seasons. Heavy fuel loads tend to be burned during the dormant season (October-March) with lighter fuel loads primarily burned during the growing season (April-September). Burning will be conducted primarily during daylight hours; night burning is not preferred due to problems associated with smoke dispersal. However, if favorable conditions exist and permits can be obtained, burning will be continued into the night.

E. Optimal Weather Conditions

The optimal winter burning conditions exist 1-3 days after the passage of a cold front that has brought 0.5-1.5 inches of rain, a relative humidity from 30-60%, air temperature of 20-60°F and north or northwest winds (4-8mph in the stand) (Crow and Shilling 1983). Winds having a westerly component are especially desirable for winter burning along the east coast of Florida. This is because they are more reliable and persistent than winds having an easterly component (Mitchell et al. 2014). Since most of our burn units require an easterly wind due to smoke management constraints, summer burning is prescribed. Easterly and sea breeze winds occur primarily during the summer starting early to mid afternoon and usually have a higher moisture content coming off the ocean creating optimal fire behavior.

F. Smoke Management

Due to the central location of Guana River WMA in relation to smoke sensitive areas, the direction, volume, and dissipation of smoke created during a prescribed fire is a primary concern. Areas that may be affected by smoke (or particulates carried by smoke) under optimum burning conditions are Highway A1A (0.5-12 miles east to southeast), St. Augustine (10-20 miles south-southeast), St. Augustine Airport (4-14

miles south), schools (2-20 miles north, west, and south, and nearby residents (Figure 4).

To minimize smoke problems, burning should be conducted when atmospheric conditions are slightly unstable, with a minimum mixing height of 1,600 feet and transport wind speeds of 9-13 mph (Southern Forest Fire Laboratory 1976, Crow and Shilling 1983). Additionally, the use of backfires, as prescribed, will produce less smoke and consume fuel more completely than a head fire. Residual smoke problems (such as stumps, snags, or logs near state or county roads) will be promptly mopped-up and monitored to minimize smoke hazards.

Smoke management can be difficult when night burning because smoke often stays close to the ground making it more difficult to predict actual smoke direction. Smoke tends to travel lower elevated areas such as creeks and lakes. Night burning will be approached with caution and in close association with Florida Forest Service to avoid these problems.

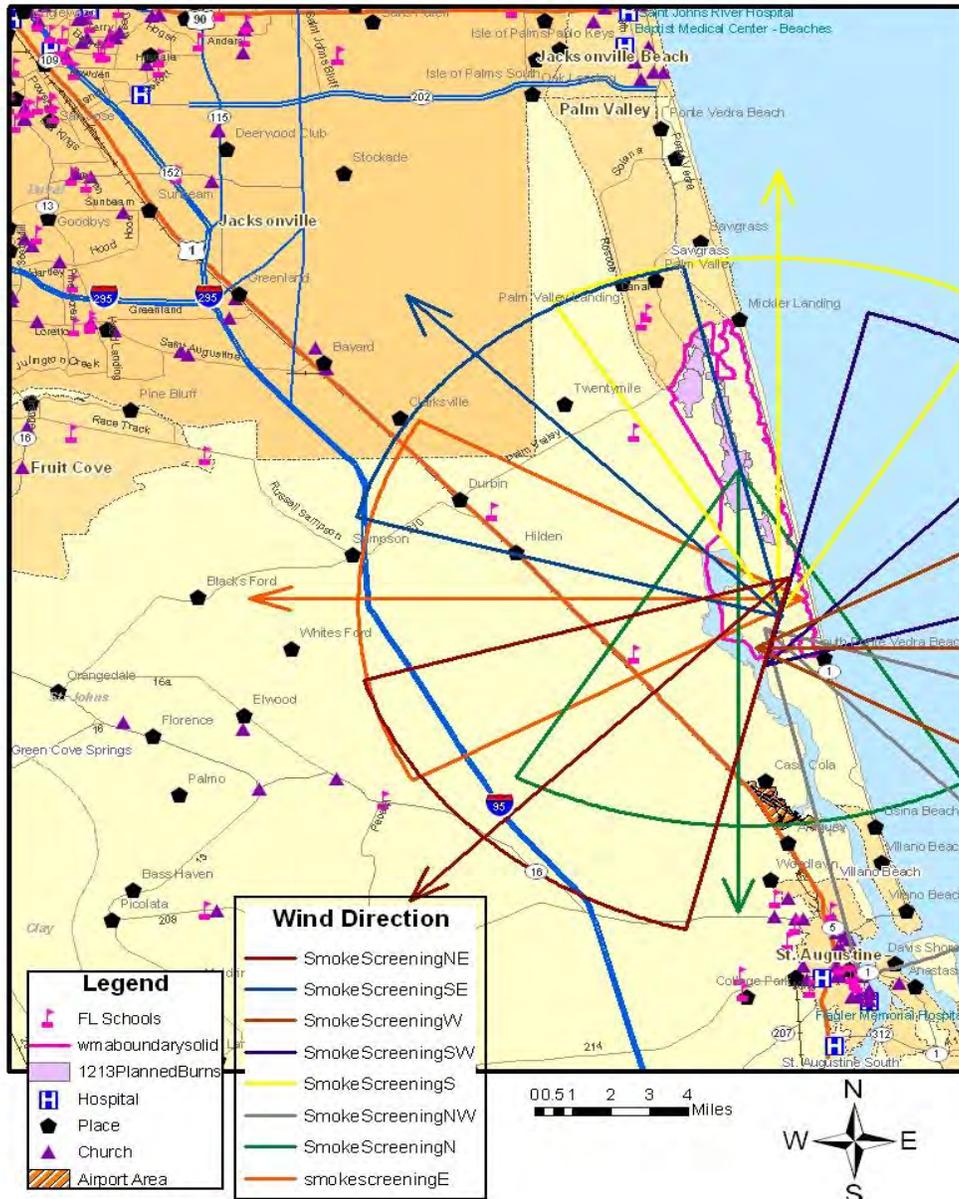


Figure 4. The relationship of smoke-sensitive areas to Guana River Wildlife Management and wind direction.

G. Personnel

Under ideal conditions and depending on the composition and structure of the burn unit, burning can be conducted with a minimum crew of three; however, a crew of four to five per compartment is optimal. Depending on compartment size and orientation, two crews (four members each) can burn two to three compartments per day. Burn crew members will be assigned tasks according to their training, equipment, and burn experiences. Certified and experienced volunteers and personnel from other state and federal agencies (FFS, DEP, TNC) will be used if needed. Commission personnel from the Northeast Region who are Certified for prescribed burning will conduct the burn.

H. Equipment

All members of the fire crew will wear all appropriate PPE required by FWC's Prescribed Burning and Wildfire Suppression Standards. Fire flaps, fire rakes, drip torches, type VI engine, tractor-plow, dozer, farm tractor, ATV's and a slip in pickup unit will be available. Required equipment will be specific to each burn unit dependent on fire return interval, complexity, size, and locality of the prescribed burn. Smoke caution signs for nearby roads will be deployed as necessary.

I. Permits and Notifications

A permit will be obtained from FFS on the morning of the burn. In addition, arrangements will be made to have a FFS suppression crew on stand-by during the burn. Notifications of burning will be given to:

1. Guana River Tolomato National Estuarine Research Reserve
2. St. Augustine Airport
3. St. Johns County Fire and Rescue
4. Florida Highway Patrol
5. St. Johns County Sheriff's Department
6. Adjacent Land Owners

J. Evaluation of Burn

Initial evaluation of the fire will be conducted within one week and include; percent crown scorch, bark char (height), fuel consumption, flame height, fire behavior, smoke dispersion, any escape, adverse publicity, objectives reached as well as any unusual observation. A follow-up evaluation will be completed within one month

and will include crown scorch, understory kill, adverse insect activity and unusual observations. These observations will be incorporated into future burn prescriptions.

K. Special Considerations

Smoke screening will direct special attention to certain areas to ensure our burns do not adversely affect adjacent landowners, nearby roads, schools, hospitals, and airports. Sensitive wildlife resources, such as Bald eagles and Gopher tortoises will be given special consideration.

Bald eagle (Haliaeetus leucocephalus) nest will be excluded from winter burning. Burn units with active nest trees in the burn unit will not be burned during nesting season between October 1st and May 15th. Extra precautions will be used to prevent the nest tree from fire induced mortality.

Gopher tortoise (Gopherus polyphemus) seem somewhat dependent on vegetation response to fire, and research has shown no adverse effects on this species from prescribed burning (Means and Campbell 1981). Fire size and intensity will be manipulated to minimize impact on individual gopher tortoises. Prescribed burning will produce more of a desirable habitat, thus having a positive effect on the population of gopher tortoises as a whole.

Summer burning may affect various wildlife species which are highly active during the summer. Nesting reptiles, birds, and mammals can also be adversely impacted by summer burns. Fire size and intensity will be manipulated to minimize fast moving headfires during optimal burning conditions.

PRESCRIBED BURNING OF MANAGED IMPOUNDMENTS

The open-water portions of the interior waterfowl impoundments on Guana River WMA are surrounded by fresh marsh and in some instances are being overgrown by cattails (Typha spp.). Burning these areas to control cattail growth and woody vegetation should be conducted while they are dewatered and dry. Marsh habitats may be burned prior to the growing season (winter or early spring) or prior to waterfowl arrival (fall), depending on objectives and environmental conditions.

Wetlands will be burned on a prescribed need to alter succession or open dense habitat for waterbird use. Fire return interval varies on the availability of vegetation that can burn and hydrological weather conditions. Similar to the interior impoundments, the cattail marsh on Guana Lake will also be burned under suitable conditions.

SUMMER BURING PROCEDURE

Summer prescribed burning is generally performed for hardwood brush control and increased herbaceous vegetation growth. High air temperature reduces the amount of heat needed to raise plant temperatures to lethal levels. Actively growing plants are more easily killed by fire than dormant plants, which results in better hardwood brush control than winter fires (Smith 2000). Growing season burns also promote an increase in herbaceous vegetation growth and species diversity, releases planted longleaf pine seedlings from vegetative competition, helps control brown-spot disease and mimics naturally occurring summer lightning fires.

Growing season burns will be conducted during April through September with desired wind speed and relative humidity as prescribed. The preferred and most reliable winds during the summer burning period are easterly to southeasterly (Mitchell et. all 2014; B. Hodges, DOF, pers. commun.). In the coastal zone, these wind conditions occur primarily in the afternoon with the presence of high pressure over or slightly north of the area. Backfires will be set along the lee side of the compartments to establish a baseline. After baseline establishment, additional ignition (aerial or ground), narrow strip-headfires using grid ignition within the unit will help minimize the potential for overstory damage and prevent a high intensity fire from building.

LITERATURE CITED

- Crow, A., B., and C. L. Shilling. 1983. Prescribed burning in Louisiana pinelands. Louisiana State Univ. Coop. Ext. Serv. Pub. 1618.
- Engstrom, T.R., and David J.B. 2002. Burning for Birds: Concepts and Applications. The role of fire in nongame wildlife management and community restoration: traditional uses and new direction. GTR-NE-288, 58-64.
- Gilliam, F.S., Platt, W.J. 1999. Effects of long-term fire exclusion on tree species composition and stand structure in an old-growth *Pinus palustris* (Longleaf pine) forest. *Plant Ecology* 140, 15-26.
- Means, D.B., and H. W. Campbell. 1981. Effects of prescribed burning on amphibians and reptiles. Pages 89-97 in G.W. Wood (ed.). Prescribed fire and wildlife in southern forests. Belle W. Baruch Forest Science Institute, Clemson Univ., Georgetown, S.C.
- Mitchell, Robert J.; Liu, Yongqiang; O'Brien, Joseph J.; Elliott, Katherine J.; Starr, Gregory; Miniati, Chelcy Ford; Hiers, J. Kevin 2014. Future climate and fire interactions in the southeastern region of the United States. *Forest Ecology and Management*
- Smith, Jane Kapler 2000. Wildland fire in ecosystems: effects of fire on fauna. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 83 p.
- Stoddard, H.L. 1971. Wildlife habitat management handbook—southern region. FSH 2609.23R, U.S. For. Serv., Atlanta, Ga.

13.12 WCPR Species Management Strategy

Guana River WMA

Species Management Strategy

January 5, 2010

Florida Fish & Wildlife Conservation Commission
Division of Habitat & Species Conservation
Terrestrial Habitat Conservation & Restoration Section
A product of the Wildlife Conservation
Prioritization & Recovery Program



EXECUTIVE SUMMARY

The Florida Fish & Wildlife Conservation Commission's (FWC) Terrestrial Habitat Conservation and Restoration section (THCR) takes a proactive, science-based approach to species management on lands in the Wildlife Management Area system (WMA/WEA). This approach uses site specific wildlife assessments of a number of [focal species](#) in conjunction with area and species expert knowledge to develop a wildlife management strategy for the area. This strategy is intended 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 represents the results of this science-based process for evaluating focal species needs for the Guana River WMA (GRWMA) within an ecosystem management approach. Management focusing on a set of carefully chosen focal species allows benefits to be extended to a host of species reliant upon the same natural communities. Targeted species can then be monitored to verify management actions applied to these natural communities is having the desired effect on wildlife. Throughout the process, the role of the area in regional and statewide conservation initiatives was considered to maximize the potential benefit.

[Section 1](#), the Introduction, informs the reader about the process used to generate this document. [Section 2](#) describes historic and ongoing management actions on the property. [Section 3](#) provides a list of the focal and listed species on the area, and an assessment of each species' level of opportunity/need. This includes species-specific goals and objectives when appropriate. Species-specific objectives were identified for 8 species on this area: gopher frog, striped newt, gopher tortoise, brown-headed nuthatch, painted bunting, northern bobwhite, Florida mice and wading birds. [Section 4](#) contains the land management actions necessary for species. This includes Strategic Management Areas (SMA) and Objective-Based Vegetation Management (OBVM) considerations. A SMA was identified to focus research on scrub management needs. Section 4 also discusses other management consideration for focal species. [Section 5](#) describes species-specific management (i.e. restocking, nest structures, etc) that may be necessary for a species, the species monitoring that is prescribed for the area, and identifies any research that would be necessary to guide future management efforts. Potential species-specific management actions are described for none of the species. Seven monitoring efforts are described, and these will provide monitoring for: gopher frog, striped newt, gopher tortoise, Bachman's sparrow, brown-headed nuthatch, northern bobwhite, painted bunting, wading birds, and Florida mouse. Opportunistic monitoring of encounters and/or nesting of other focal or listed species is recommended. The conservation of these species requires interaction with other parties beyond local staff. Intra-agency coordination with 6 other units in FWC and inter-agency coordination with 5 other entities are identified in [Section 6](#). [Section 7](#) describes efforts that are prescribed to occur "beyond the area's boundaries" to ensure conservation of the species on the area.

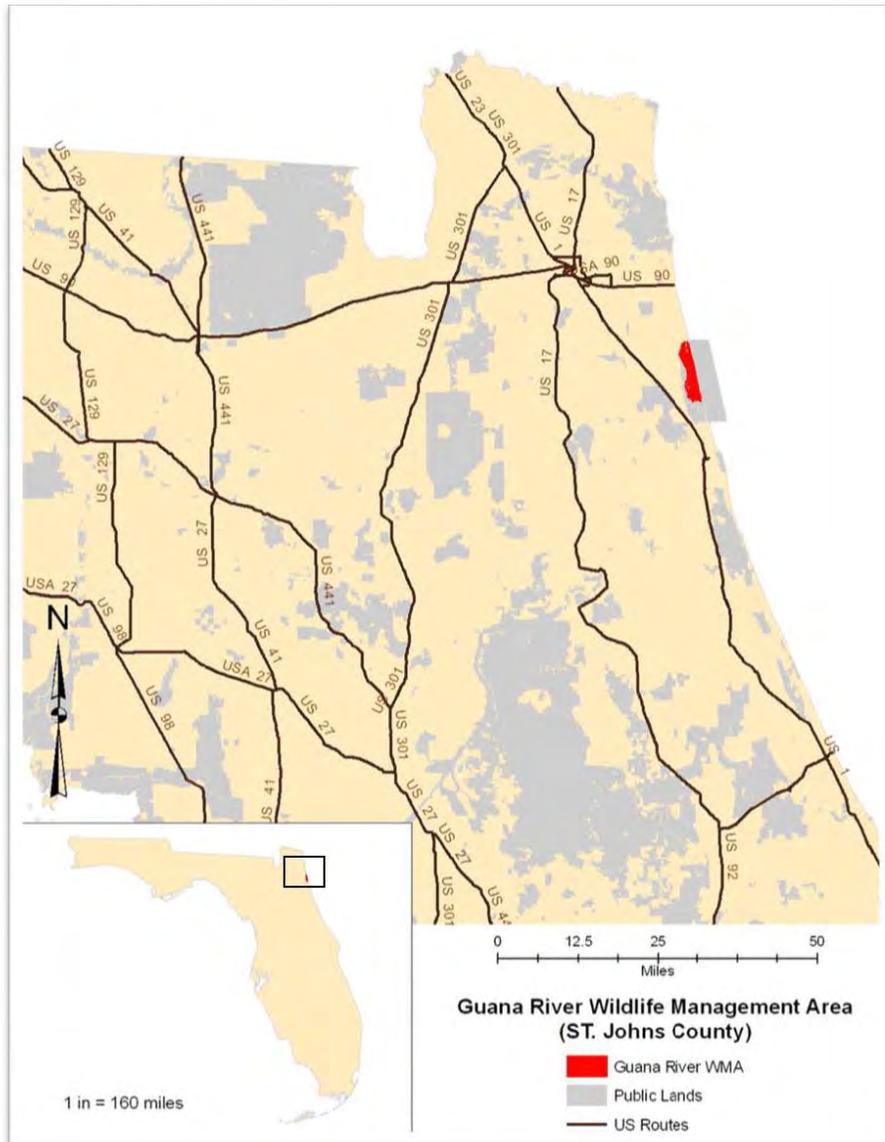
Continuation of current resource levels would be required to provide for most of the land management recommended in this document. These actions can be conducted either by area staff or by contracting with vendors. Some of the monitoring recommendations may require additional resources, while others can be accomplished with continuation of existing resources.

Table of Contents

Executive Summary	i
Locator Map	iv
Section 1: Introduction	1
Section 2: Current and Historic Management on Guana River WMA	2
Section 3: Area Focal Species	4
3.1: Guana River WMA Focal Species	5
3.2: Focal Species Opportunity/Needs Assessment	6
3.2.1: <i>Gopher Frog</i>	6
3.2.2: <i>Striped Newt</i>	7
3.2.3: <i>Gopher Tortoise</i>	8
3.2.4: <i>American Swallow-Tailed Kite</i>	9
3.2.5: <i>Bachman's Sparrow</i>	10
3.2.6: <i>Brown-Headed Nuthatch</i>	10
3.2.7: <i>Cooper's Hawk</i>	11
3.2.8: <i>Limpkin</i>	12
3.2.9: <i>Northern Bobwhite</i>	13
3.2.10: <i>Painted Bunting</i>	14
3.2.11: <i>Southern Bald Eagle</i>	15
3.2.12: <i>Wading Birds</i>	16
3.2.13: <i>Florida Mouse</i>	17
3.2.14: <i>Limited Opportunity Species</i>	18
3.2.15: <i>Other Imperiled Species</i>	20
Section 4: Land Management Actions and Considerations	21
4.1: Strategic Management Areas	22
4.1.1: <i>Scrub Management Research</i>	22
4.2: Objective-Based Vegetation Management Considerations	25
4.2.1: <i>Modifications to Desired Future Conditions</i>	27
4.3: Further Land Management Considerations	28
4.3.1: <i>Gopher Frog/Striped Newt</i>	28
4.3.2: <i>Gopher Tortoise</i>	28
4.3.3: <i>Swallow-Tailed Kite</i>	28
4.3.4: <i>Bachman's Sparrow</i>	29
4.3.5: <i>Brown-Headed Nuthatch</i>	29
4.3.6: <i>Cooper's Hawk</i>	29
4.3.7: <i>Limpkin</i>	30
4.3.8: <i>Northern Bobwhite</i>	30
4.3.9: <i>Painted Bunting</i>	30
4.3.10: <i>Bald Eagle</i>	31
4.3.11: <i>Wading Birds</i>	31
Section 5: Species Management Opportunities	31
5.1: Species Management	32
5.2: Species Monitoring	32
5.2.1: <i>Gopher Frog Monitoring</i>	32
5.2.2: <i>Striped Newt Dipnet Monitoring</i>	33

5.2.3: Gopher Tortoise Monitoring	33
5.2.4: Avian Spring Call Count Survey.....	33
5.2.5: Painted Bunting Monitoring.....	34
5.2.6: Wading Bird Monitoring	34
5.2.7: Florida Mouse Monitoring.....	34
5.2.8: Opportunistic Monitoring.....	34
5.3: Species Research Needs	35
5.3.1: Painted Bunting and Nesting Habitat.....	35
5.3.2: Florida Mouse and Optimal Habitat Conditions	35
Section 6: Intra/Inter Agency Coordination.....	35
6.1: Florida Fish & Wildlife Conservation Commission.....	36
6.1.1: Species Conservation Planning Section (SCPS)	36
6.1.2: Hunting & Game Management.....	36
6.1.3: Fish and Wildlife Research Institute (FWRI)	36
6.1.4: Habitat Conservation Scientific Services (HCSS)	37
6.1.5: Wildlife Legacy Initiative.....	37
6.1.6: Invasive Plant Management Section.....	37
6.2: Florida Department of Environmental Protection (DEP)	38
6.3: Division of Forestry (DOF)	38
6.4: St. Johns River Water Management District (SJRWMD).....	38
6.5: Florida Natural Areas Inventory (FNAI).....	38
6.6: St. Johns County Recreation & Parks.....	39
Section 7: Beyond the Boundaries Considerations	39
Document Map	41

Locator Map



Section 1: Introduction

The FWC takes a proactive, science-based 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 to help FWC determine where [focal species](#) conservation can be affected. These landscape level assessments are then combined with area specific and expert knowledge and result in the creation of Species Management Strategies (Strategy) specific to each WMA.

This Strategy is intended 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. On FWC lead areas, goals and objectives included in the Management Plan (formerly known as Conceptual Management Plan) are referenced when discussing the species and drafting the Strategy; 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 Plan. In this document, goals, objectives and strategies are defined as follows: Goals are broad statements of a condition or accomplishment to be achieved in the future; goals may be unattainable, but provide direction and inspiration. Objectives are a measurable, time-specific statement of results that responds to pre-established goals. Strategies are the actions that will be taken to accomplish a goal or objective, and strategies may be measurable.

Species-specific habitat models were used to create statewide potential habitat maps. A GIS analysis was conducted to determine which of the focal species were modeled to have potential habitat on each area. We use local staff's knowledge, species-expert knowledge, and area-specific maps of natural communities to refine habitat information for each species and evaluate the area's potential role in conservation of the species. A workshop was conducted at which all individuals involved in the decision making process discuss the focal species status, evaluate opportunities for land and species management on the area, and decide on appropriate monitoring and/or research actions. Some species cannot be expected to persist on an area based solely on area-specific measures; therefore, this strategy identifies intra- and interagency coordination and any "beyond the boundary" considerations (i.e. working with neighboring landowners) necessary for the management of focal species. Area-specific species objectives, a list of necessary actions to achieve these objectives, and the monitoring necessary to verify progress towards objectives are agreed upon and used to create the area's Strategy.

The primary focus of this approach is non-game species; however, 2 of the statewide focal species are game birds. Specific game management actions are not included in this Strategy, though game management actions are considered when drafting the Strategy and are compatible with the actions prescribed by this Strategy. While this Strategy focuses on the GRWMA, it considers the role of the area within the larger state or regional context. Similarly, while the Strategy has species-specific objectives and actions, it does not espouse single-species management. FWC land management focuses on natural communities' management that benefits the host of species that naturally occur in each natural community. However, some species may need directed actions if they are to recover from past declines or be restored to habitat from which they were previously extirpated. By implementing the

Strategy, FWC believes our management will benefit the largest suite of native wildlife by keeping common species common and aiding in the recovery of listed species.

Section 2: Current and Historic Management on Guana River WMA

The State's Conservation and Recreation Lands committee originally recommended the GRWMA for purchase in 1983. The project proposal highlighted the unique mixture of natural communities on-site. The actual purchase of roughly 12,000 acres occurred from July 1984 through January 1987. GRWMA is approximately 9,815 acres, leased to and managed by FWC since 1988. The Florida Department of Environmental Protection (DEP) manages the remaining acreage of the original purchase as the Guana Tolomato Matanzas National Estuarine Research Reserve (GTMNERR).

Prior to state acquisition, Stockton, Whatley, Davin, and Company owned the acreage currently managed as GRWMA from 1931 to 1980. The group tried unsuccessfully to sell the land to the State for a park as early as 1965. While in private ownership, portions of the property were leased for timber harvesting, cattle and hog grazing, apiary rights, a hunting preserve, and a WMA. The WMA lease agreement was not renewed in 1981. The Gate Petroleum Company acquired the property in the early 1980s and subsequently sold it to the State.

Intense timber harvesting occurred on the property from 1930 – 1970, with an on-site sawmill near McNeil's Pond that later moved to Booth's Pond around 1950. Approximately 900 acres were reforested in the mid-1970s. Aside from sporadic prescribed burning, no other forest management practices were employed. A dam was installed on the Guana River from 1957-62 creating Guana Lake, also known as Lake Ponte Vedra. Creation of the dam was a joint project between the Florida Game and Fresh Water Fish Commission and the private landowners. The dam was installed to benefit migratory waterfowl and increase fishing opportunities. The private landowner worked with the Anastasia Mosquito Control District in the early 1960s to create additional interior impoundments (Little and Big Savannah, Booth's, and Cook's).

The FWC contracted with the Florida Natural Areas Inventory (FNAI) to map current natural community types on GRWMA. Actively managed plant communities on the area include pine plantation, mesic flatwoods, scrubby flatwoods, and scrub (Table 1). In addition to these communities, FWC actively manages the interior impoundments and the 2,400-acre Guana Lake through water level manipulation. The OBVM workshop process was used to delineate management units and define Desired Future Conditions (DFC) for specific vegetative parameters for the actively managed communities.

Prescribed fire is the primary tool used to manage and restore natural communities on GRWMA. A total of 3,315 acres of fire-maintained communities exist on GRWMA and approximately 1/3rd of these are burned on an annual basis. In some natural communities, particularly scrub, mechanical treatment is used to create conditions that allow for the use of prescribed fire.

Invasive species are not a large problem on GRWMA; Chinese tallow tree (*Sapium sebiferum*), Brazilian pepper (*Schinus terebinthifolius*), torpedo grass (*Panicum repens*), bermuda grass (*Cynodon* spp.), bahia grass (*Paspalum notatum*), natal grass (*Rhynchelytrum repens*), and water hyacinth (*Eichhertia crassipes*) are treated on as-needed basis.

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

Natural Community	Acreage mapped	Actively Managed ¹	# of Species That Use the NC
basin marsh	154.2		5
basin swamp	140.4		5
baygall	36.0		2
depression marsh	225.0		3
dome swamp	8.0		5
hydric hammock	1.5		3
maritime hammock	767.3		4
mesic flatwoods	1,161.5	Yes	13
mesic hammock	248.4		4
open water	1,207.2		3
pine plantation	775.0	Yes	2
ruderal	1,215.4		3
scrub	338.8	Yes	8
scrubby flatwoods	174.1	Yes	10
tidal marsh	2,053.9		2
wet flatwoods	37.2		6
xeric hammock	394.6		6
TOTAL ACRES	8,938.5		

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

Note: Freshwater and coastal impoundments were not mapped on GRWMA but are actively managed through water manipulation and have OBVM desired conditions associated with them.

A hydrologic assessment of GRWMA by HDR Engineering, Inc. concluded that mosquito ditches in the northwest corner of GRWMA have likely reduced the amount of freshwater flow to the wetland system. Additionally, development activities to the north have reduced opportunities for surface water to flow into the GRWMA. Field inspection of wetlands during the assessment suggest that ditching activities and development have had few additional negative impacts other than reducing the total amount of wetlands and possibly increasing saline levels of surface water. While the mosquito ditches have re-routed the natural flow of surface water, filling or blocking of them would reduce the overall hydroperiod. The assessment recommended allowing the ditches to remain since the alternative would be more detrimental to wetland hydroperiod.

Current monitoring actions for wildlife on GRWMA completed by area staff include spring call counts for northern bobwhite (*Colinus virginianus*; [Section 3.2.9](#)), wild turkey (*Meleagris gallopavo*) camera surveys and white-tailed deer (*Odocoileus virginianus*) spotlight surveys that show a healthy, stable population. The turkey monitoring indicates a

healthy, increasing population since re-introduction efforts in 2002. The white-tailed deer survey indicates a healthy, stable population.

Some monitoring is completed by other FWC divisions or state agencies. An inventory of secretive marsh birds (completed by DEP staff) verified a breeding population of clapper rail (*Rallus longirostris*), least bittern (*Ixobrychus exilis*), marsh wren (*Cistothorus palustris griseus*), and king rail (*Rallus elegans*) on GRWMA. Bald eagle (*Haliaeetus leucocephalus*; [Section 3.2.11](#)) nest monitoring (completed by Fish and Wildlife Research Institute [FWRI] staff) documented 10 eagle nests within 10 miles of GRWMA (including several on GRWMA).

Results of monitoring for focal species are included in the species' assessments. Historically, inventories occurred for striped newts (*Notophthalmus perstriatus*), gopher tortoises (*Gopherus polyphemus*), small mammals, and herpetofauna. Small mammal trapping survey used live traps spaced along drift fence arrays used for herpetofaunal surveys. Mammal surveys documented 9 species including the Florida mouse (*Podomys floridanus*), southern flying squirrel (*Glaucomys volans*), eastern woodrat (*Neotoma floridana*), and golden mouse (*Ochrotomys nuttalli*). Herpetofaunal surveys used drift fences, funnel traps, and pitfall traps and documented 26 species including coastal dunes crowned snake (*Tantilla relicta pamlica*) and northern scarlet snake (*Cemophora coccinea copei*).

FNAI documented the presence of rare plants during the natural community mapping project and the findings are described in [Section 3.2.15](#).

Section 3: Area Focal Species

FWC bases its land management on restoring the form and function of natural communities. However, in some instances it is important to consider the needs of specific species, and it is necessary to monitor the impacts of natural communities' management on select wildlife. In an effort to ensure a focused, science informed approach to species management, FWC uses the focal species concept embraced by the Wildlife Habitat Conservation Needs in Florida project (http://research.myfwc.com/features/view_article.asp?id=29815). The focal species approach incorporates a variety of concepts and considerations that, if applied correctly, allow one to identify the needs of wildlife collectively by strategically selecting a subset of wildlife species. The species selected as focal species includes umbrella species, keystone species, habitat specialists, and indicator species. For the Public Lands Conservation Planning (PLCP) project, 60 focal species were selected for the statewide assessment. Statewide potential habitat maps were created for each species using species-specific models. Models were created using relevant available data. The base layer for all models was the FWC 2003 landcover data. Additional data layers such as the species range, soils, land use, etc were selected based on the natural history of the species. As such, each model is species specific. Once statewide potential habitat maps were available, a PVA was conducted for each focal species.

Using the statewide landcover-based habitat maps, 16 of the 60 focal species were modeled to have potential habitat on GRWMA. Two additional focal species, the striped newt and Florida mouse, are known to occur on the property even though landcover based models did not identify potential habitat on site. One of the species modeled to have

potential habitat, the Anastasia Island beach mouse, does not have any actual habitat on GRWMA. To create more accurate area-specific potential habitat maps, we used the same statewide model for each focal species on the area but replaced the landcover data with natural community data. The resulting potential habitat map was then refined based on the input of local managers and species experts. All potential habitat acres provided in [section 3.2](#) are the results of this area-specific model and resulting map.

Information on the focal species were compiled and provided in a workbook to allow for informed discussion of the species. The GRWMA Wildlife Conservation Prioritization and Recovery (WCPR) Workshop was held to bring decision makers together and allow for discussion on: an assessment of the opportunity and needs; identification of measurable objectives; a description of necessary actions including monitoring; and any coordination efforts that are necessary. The “level of opportunity and need” for each species was discussed at the workshop. This included analyzing the long-term security of the species (i.e., examine PVA results), considering if the species occurs in actively managed communities ([Table 1](#)), 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 this assessment of each species is available in [Section 3.2](#).

3.1: Guana River WMA Focal Species

Species that have a measurable objective are indicated with a ¹; species for which monitoring is recommended are indicated with a ²; and species for which a SMA is identified are indicated by a ³. Occasionally species are modeled to have potential habitat on the area when using statewide data; however, the local assessment indicates there is little opportunity to manage for these species on the area and they are not a focus of management on the area. These species are identified with an * and their assessments are found in the “Limited Opportunity Species” ([Section 3.2.14](#)).

- Gopher frog (*Rana capito*)^{1,2}
- Striped newt (*Notophthalmus perstriatus*)^{1,2}

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

- American swallow-tailed kite (*Elanoides forficatus*)
- Bachman’s sparrow (*Aimophila aestivalis*)²
- Brown-headed nuthatch (*Sitta pusilla*)^{1,2}
- Cooper’s hawk (*Accipiter cooperii*)
- Limpkin (*Aramus guarana*)
- Northern hobwhite (*Colinus virginianus*)^{1,2}
- Painted bunting (*Passerina ciris*)^{1,2}
- Red-cockaded woodpecker (*Picoides borealis*)*
- Southern bald eagle (*Haliaeetus leucocephalus*)
- Wading birds (multiple species)^{1,2}

Anastasia Island beach mouse (*Peromyscus polionotus phasma*)*
Florida black bear (*Ursus americanus floridanus*)*
Florida mouse (*Peromyscus floridanus*)^{1,2}
Sherman's fox squirrel (*Sciurus niger shermani*)*

3.2: Focal Species Opportunity/Needs Assessment

This section provides an assessment of the opportunity and needs of each of the focal species. Unless otherwise noted, all acres of potential habitat are the result of using the area-specific natural community data in the species potential habitat model. We presume that doing the actions called for in this strategy will ensure the area fulfills its role in the conservation of wildlife.

3.2.1: Gopher Frog

Gopher frogs have not been documented on GRWMA, and were not detected during herpetofaunal surveys within scrub during the early 2000s. However, species-specific efforts to document gopher frogs on GRWMA have not been completed. Conversations with park staff at GTMNERR indicate gopher frogs have not been heard on GRWMA or the state park. Gopher frogs prefer to breed in seasonally flooded grassy ponds and cypress heads that lack predatory fish. After breeding, frogs move into uplands and often occupy gopher tortoise burrows. They also use rodent and crayfish burrows, stump holes, and hollow logs. They rarely move more than 1 mile from breeding habitat.

Statewide, the gopher frog is of moderate priority and triggers 2 of 6 statewide prioritization parameters (Legacy population trend and proportion of populations modeled to persist on public lands). It is a state-listed species of special concern. On GRWMA, models indicate 3,141 acres of potential habitat within existing natural communities. While information on minimum habitat requirements or home ranges for this species is lacking, the available acreage should be enough to support a viable population. If the species occurs on GRWMA, there is good opportunity for management to have significant impacts. Continued use of prescribed fire in scrub, mesic flatwoods, and isolated wetlands should maintain and/or enhance suitable habitat for gopher frogs.

While there is an adequate amount of potential habitat, there are concerns about isolation and whether this species could reach GRWMA if not currently present. The Intracoastal Waterway to the west and urban development along GRWMA's northern and southern boundaries are effective barriers to movement. Thus, while the gopher frog is management responsive and of moderate statewide priority, there is little opportunity for local management to have significant impacts if it does not occur on the area.

While never detected during herpetofaunal surveys within patches of scrub, additional monitoring ([Section 5.2.1](#)) is proposed to determine the status of gopher frogs on GRWMA. If the species is not detected by 2015 this assessment may need to be revisited and/or a decision made on whether or not restocking is an appropriate action. Additional land management recommendations are found in [Section 4.3.1](#).

There are no species management recommendations at this time; however, if the species is not documented on the area, this may need to be revisited.

Because ongoing natural communities' management of xeric uplands and depressional ponds should benefit this species, no SMA is recommended. The area goal is to create and maintain habitat conditions that will enhance the opportunity of maintaining a viable population of gopher frogs on GRWMA if the species occurs on the area. The area objectives are:

- 1) Conduct a baseline survey to determine the presence of this species on the WMA by 2012, weather permitting; and
- 2) Use standard call count monitoring protocol to verify the continued presence of this species on the area over time, if found on-site.

If the species is not detected on GRWMA by 2015, the surveys can be discontinued.

3.2.2: Striped Newt

Striped newts were detected on GRWMA during dipnet surveys in 2007. One adult was found during March 2007 and larvae were detected within one depressional pond located in management unit 52 that is located a few hundred meters from a patch of scrubby flatwoods. This pond was resurveyed in 2008, and no newts were detected. Newts are known to occur in depressional ponds on the GTMNERR. Striped newts are dependent on ephemeral breeding ponds that lack large predatory fish within a larger landscape of open, fire-maintained forests. After breeding, newts move into adjacent xeric uplands like sandhill, scrub, and scrubby flatwoods. Due to the loss of habitat to agriculture, intensive silviculture, and development, this is one of the most imperiled amphibian species in Florida.

Statewide, the striped newt is of high priority and triggers 4 of 6 statewide prioritization parameters (Millsap biological and supplemental score, Legacy population status and trend). On GRWMA, models indicate 2,373 acres of potential habitat within existing natural communities. While information on minimum habitat requirements or home ranges for this species is lacking, the available acreage should be enough to support a viable population, especially when considering the available habitat on GTMNERR. There is good opportunity for ongoing management that consists of prescribed burning of upland habitats and periodic burning of wetlands to benefit striped newts. Allowing prescribed fire to burn through depressional wetlands whenever possible maintains a grassy ecotone, which benefits many amphibian species. Burning also consumes muck/peat, kill shrubs, and stimulates the growth of grasses like maidencane (*Panicum hemitomon*), actions that benefit this species. The Coastal Plains Institute conducted a breeding pond assessment on GRWMA in April 2009. Once the final report on this pond assessment is available, more specific land management considerations for ephemeral wetlands may be available.

Despite their presence on the area and the amount of potential habitat, there are concerns about whether or not this species could reach the area if extirpated. It is unlikely this species would be able to cross the Intracoastal Waterway or disperse through development along GRWMA's boundaries. As this population is isolated

and occurs along the coast, which is subject to catastrophic storm events, its long-term viability is uncertain.

Given the amount of potential habitat, the opportunity for management to create/maintain habitat, and the fact the species is documented on GRWMA; it is considered a species of medium opportunity. This is a management responsive species that is dependent on fire to maintain its preferred habitat conditions. Breeding ponds must be maintained in a natural condition and should not have their hydrology altered and adjacent uplands need proper maintenance as well. Because existing land management actions will continue to provide suitable habitat, there is no need for an SMA or measurable objectives. Other land management considerations are found in [Section 4.3.1](#), and monitoring recommendations to verify continued presence on GRWMA are found in [Section 5.2.2](#). The area goal is to maintain habitat conditions that will enhance the opportunity of maintaining a viable population of striped newts on GRWMA. The area objective is:

- 1) Use standard dip net monitoring protocol to document breeding ponds and to monitor use of these ponds by this species on the area over time.

3.2.3: Gopher Tortoise

This species is commonly seen on GRWMA. The gopher tortoise is a management-responsive species that, when present, can be used to assume habitat suitability for other, less evident species. The FWC recently approved a management plan that places emphasis on increasing the number of tortoises on public lands. Portions of GRWMA were surveyed in 2007 as part of a FWC assessment examining the potential to use public lands as re-stocking sites. Surveys occurred in 5 separate patches (~60 acres total) of medium-high quality habitat and found low (<1 burrow/acre) to medium (1-2 burrows/acre) tortoise densities. This study concluded GRWMA is not an appropriate restocking site due to its current population size and the likelihood that the population would increase on its own.

Statewide, the gopher tortoise is a high priority and triggers 4 of 6 statewide prioritization parameters (Millsap biological score, Millsap supplemental score, Legacy population trend and proportion of populations modeled to persist on public lands). The species is a state-listed threatened species. The continued persistence of this species on GRWMA benefits other focal wildlife species, including the Florida mouse and gopher frog. On GRWMA, models indicate 910 acres of potential habitat within existing natural communities. There is discussion in the literature about the minimum requirements to sustain a population of gopher tortoises with estimates ranging from 50 – 200 or more acres. As the potential habitat model identified 910 acres, it is likely that GRWMA has enough habitat to support a viable population provided densities of > 1 tortoise per acre can be achieved and maintained. A baseline density estimate for tortoises on GRWMA has not been determined.

Because of the amount of potential habitat, the opportunity for management to further enhance this habitat, and the species current presence on the area it is considered a high opportunity species. Ongoing natural communities' management emphasizing frequent use of prescribed fire and timber management that maintains a mature, open pine stand in pine flatwoods will promote a diverse groundcover that

benefits gopher tortoises. Because existing natural communities' management will benefit this species, no SMA is recommended. However, to better meet the needs of the species, we recommend making a number of modifications to the OBVM DFC ([Section 4.2.1](#)).

Monitoring is recommended to document distribution of gopher tortoises and provide a baseline of information on burrows for trend assessment. Continued monitoring will allow for tracking changes over time. [Section 5.2.3](#) contains the monitoring recommendations and [Section 4.3.2](#) contains other specific land management considerations for the gopher. The current density of the species (as determined by the FWC re-stocking assessment) on GRWMA does not meet the guidelines for restocking; therefore, there is no species management actions recommended.

The area goal for this species is to maintain a viable population. The measurable objectives are to:

- 1) Determine the baseline distribution of the species on GRWMA by completing a burrow survey by 2012.
- 2) Repeat this survey every 5 years.
- 3) Track changes in relative abundance over time.

3.2.4: American Swallow-Tailed Kite

The swallow-tailed kite is commonly seen during the late summer months on GRWMA. No nests have been documented on the area but comprehensive searches have not occurred. Most individuals are observed after breeding has occurred. Swallow-tailed kites use a variety of natural communities, requiring a mosaic of tall trees for nesting habitat and open areas for foraging habitat. Dominant trees, which are significantly taller than surrounding trees, are preferred for nesting sites. Shrub height and density tends to be higher around nest sites.

Statewide, swallow-tailed kites are a moderate statewide priority and trigger 4 of 6 statewide prioritization parameters (proportion of populations modeled to persist on public lands and probability of a 50% decline on public lands, Legacy population status and population trend). Models indicate 1,476 acres of potential habitat within existing natural communities. Given the generalist nature of this species and its high mobility, it is not considered management dependent and the opportunity for management to have a significant impact on this species at the management area level is low. However, ongoing management to restore natural communities' structure and function should continue to benefit this species. Should nests be detected, management consideration around nests sites should be employed ([Section 4.3.3](#)). There is no species management necessary for this species on the area; however, documentation of nests is recommended if individuals are observed frequently in an area ([Section 5.2.8](#)).

While there is limited management opportunity for this species and no need for a SMA, it is considered a species of medium priority on GRWMA. This is due to the number of parameters triggered and the fact that the species frequently uses the area. Area-specific objectives for this species are not needed as this species is more appropriately monitored at the regional level.

The area goal is to continue to provide suitable potential nesting and foraging habitat for the American swallow-tailed kite that will allow the kites using GRWMA to function as part of a regional population. It is unlikely any single WMA could independently sustain a population of swallow-tailed kites, and the continued existence of this species on GRWMA will be influenced by what happens at the regional level.

3.2.5: Bachman's Sparrow

Staff have not heard or seen Bachman's sparrows on GRWMA, although specific efforts to document their presence have not been attempted. Little specific information exists on the abundance of Bachman's sparrows on neighboring lands; however, it is likely they persist in frequently burned areas on D Dot Ranch, a piece of private land located to the northwest of GRWMA. Bachman's sparrows are currently experiencing range-wide population declines. This species prefers mature pine forests with a healthy herbaceous groundcover maintained with frequent fire or early successional old-field habitat. Use of an area by Bachman's sparrows declines rapidly around 18 months post-fire. Pockets of open ground are an important component of this species' nesting habitat, and singing males need small clumps of shrubs for perching sites.

Statewide, Bachman's sparrows are a low to medium priority and trigger 2 of 6 statewide prioritization parameters (a declining Legacy population trend and a low proportion of populations on state lands modeled to persist). On GRWMA, models indicate 1,937 acres of potential habitat within existing natural communities. Literature suggests this is enough habitat to support a viable population if densities of 0.13 birds per acre can be maintained on at least 510 acres. Ongoing use of prescribed fire and other management actions on GRWMA will promote open, mature pine flatwoods appropriate for this species. Efforts to increase the diversity of herbaceous ground cover, particularly grasses, will benefit this species. Because existing management actions focused on natural communities' restoration and specific actions taken for other focal species will enhance habitat for Bachman's sparrows, there is no need for a SMA.

[Section 4.3.4](#) contains specific land management practices to benefit Bachman's sparrows. The monitoring recommendations for Bachman's sparrows include adding it as an additional species recorded during spring bobwhite whistle counts ([Section 5.2.4](#)). The purpose of this is to enhance the ability to document the species should it occur on GRWMA. If this species is detected on GRWMA there may be a need to revisit monitoring actions. The area goal is to create/maintain habitat conditions that will promote occupancy of Bachman's sparrows on GRWMA. There are no measureable objectives but this could be revisited if Bachman's sparrows are detected.

3.2.6: Brown-Headed Nuthatch

Brown-headed nuthatches are commonly seen and heard on GRWMA. While nesting has not been documented, the presence of this species during the nesting

season indicates nesting likely occurs and nesting is known to occur on the adjacent GTMNERR. This species, like the northern bobwhite and Bachman's sparrow, prefers open stands of mature pine timber managed with frequent fire. Unlike the other birds, this species is a primary cavity nester that selects decaying snags to excavate, especially old short snags.

The brown-headed nuthatch is a low to medium statewide priority and triggers 2 of 6 statewide prioritization parameters (a declining Legacy population trend and proportion of populations modeled to persist on public lands). Models indicate 1,937 acres of potential habitat within existing natural communities. Literature suggests between 320 and 1,000 acres are necessary to support a viable population of this species. Given this, GRWMA has the potential to support a viable population of brown-headed nuthatches. Flatwoods located in the central and southern part of GRWMA currently have habitat that is appropriate for this species. Nuthatches are commonly seen and heard in flatwoods to the west and south of Cooks Pond. Flatwoods further south, treated with mowing and prescribed fire in recent years should continue to increase in suitability over time. Flatwoods in the northern portion of GRWMA are more difficult to manage due to their high volume of timber and smoke management issues that make burning difficult. As a result, these stands are less suitable to brown-headed nuthatches.

This species is management responsive and there is good opportunity for management on GRWMA to have significant impacts; therefore, it is considered a species with a high level of management opportunity. Because breeding success is correlated with increasing snag density, snags should be created and maintained if necessary. Of particular interest to this species are old short snags with soft wood and flaking bark and old decaying oaks with a diameter at breast height of < 10 inches. [Section 4.3.5](#) contains additional land management considerations and [Section 5.2.4](#) contains monitoring recommendations. There are no species management recommendations for this species at this time.

Existing land management to restore natural communities' structure and function will benefit brown-headed nuthatches and there is no need to identify specific management units for strategic management. The goal for this species is to maintain a viable population on GRWMA. The measurable objectives are to:

- 1) Conduct an initial survey by spring 2010 to establish a baseline estimate of relative abundance for the brown-headed nuthatch population, and
- 2) Track changes in the relative abundance trends using information from these spring counts until the WCPR strategy is updated.

3.2.7: *Cooper's Hawk*

The status of the Cooper's hawk on GRWMA is unknown, although it likely occurs on and uses portions of GRWMA. This species forages in many natural communities and can nest in a variety of habitats, including swamps, floodplain and bottomland forests, sand pine scrub, and baygalls. Given this species' use of multiple habitats, much of the GRWMA likely serves as and will continue to serve as potential habitat.

The Cooper's hawk triggers 1 of 6 statewide prioritization parameters (probability of a 50% decline on public lands). On GRWMA, models indicate 1,642 acres of potential habitat within existing natural communities. Given the variety of natural communities used by this species, it is not considered management dependent and the opportunity for management to have a significant impact on this species at the management area level is low. Ongoing management to restore natural communities' structure and function, including thinning of pine flatwoods where appropriate, should continue to benefit this species. Should nests be detected, land management consideration around nests sites should be employed ([Section 4.3.6](#)). There is no species management necessary for this species on the area and documentation of nesting is recommended ([Section 5.2.8](#)).

Because the management opportunity for this species is low, no strategic management area is necessary. The area goal is to promote suitable foraging and nesting habitat for the Cooper's hawk that will allow individuals using GRWMA to function as part of a regional population. However, the continued presence of Cooper's hawks on GRWMA is dependent on conditions that influence the regional population.

3.2.8: Limpkin

Limpkins are dependent on apple snails and aquatic mollusks and use freshwater marshes, swamps, springs and spring runs, and pond and river margins. Limpkins are occasionally seen around the dam at the southern end of Guana Lake, and conversations with Saint Johns Audubon Society suggest this species may use portions of Diego pond on the northern end of GRWMA. This species is commonly seen on areas immediately surrounding GRWMA.

The limpkin triggers 1 of 6 statewide prioritization parameters (an unknown Legacy population trend) and is a state listed species of special concern. On GRWMA, models indicate 1,502 acres of potential habitat within existing natural communities. While information on minimum habitat requirements for this species is lacking, based on the natural history of the species, GRWMA likely does not have enough potential habitat to support a viable limpkin population. However, GRWMA does play a role in supporting the regional limpkin population.

While limpkins will respond to management actions that change marsh structure, they are highly mobile, respond to impacts at the regional scale, and may or may not respond to on-site management actions. Existing management of GRWMA's water levels provides ample habitat for individuals moving through the landscape. Thus, the opportunity for management to have significant impacts on this species is minimal. Ongoing water management should continue to benefit this species.

[Section 4.3.7](#) contains land management considerations for limpkins. There are no species management recommendations for this species at this time, however opportunistic monitoring of nests and the sighting of dependent young of the year is recommended ([Section 5.2.8](#)). There is no need for a SMA, or measurable objective for limpkins. The area goal is to promote suitable habitat for limpkins that will allow individuals using GRWMA to function as part of a regional population. However,

the long-term persistence of limpkins on GRWMA will be influenced by factors affecting the regional population.

3.2.9: Northern Bobwhite

Northern bobwhites are commonly seen on GRWMA and are surveyed annually using spring whistle counts. Monitoring of this species on GRWMA has documented a low but persistent presence over time. While variable from year to year, trend data show a general increase in birds heard in the last few years. Any increase in the bobwhite population on GRWMA is likely due to management actions that have restored open habitats through mechanical treatments and prescribed fire. This species is associated with open canopy forests and grassland communities dominated by warm-season grasses, legumes, and patchy bare ground. A mosaic of habitat characteristics are required for this species as weedy areas are used for raising broods and for bugging habitat; shrubs or other thickets are useful as roosting habitat or escape cover.

A popular game species, bobwhites have experienced significant range-wide population declines since the 1980's. The bobwhite triggers 2 of 6 statewide prioritization parameters (a low Legacy population status and a declining population trend) and are a major focus of many initiatives including the Upland Ecosystem Restoration Project. On GRWMA, models indicate 2,920 acres of potential habitat within current natural communities. This amount of potential habitat is enough to support a small, but viable population. However, the interspersed unsuitable natural communities within GRWMA's useable flatwoods and xeric uplands will continue to limit the opportunity to grow a large bobwhite population. Hammocks and wetlands are not suitable habitat for bobwhite, limit their movements, and provide habitat for potential predator species.

Statewide, the bobwhite is a moderate to high priority due to ongoing population declines, its popularity as a game bird, the fact that many species benefit from bobwhite management and the many conservation initiatives tied to this species. On GRWMA, the amount of potential habitat and likelihood of existing management actions to have significant impacts make the bobwhite a species of moderate opportunity for management. Flatwoods located immediately to the west and north of Cooks Pond currently have some of GRWMA's best bobwhite habitat. These units have diverse groundcover with pockets of bare ground and a low basal area of pines. Flatwoods located in the southwest portion of GRWMA were mowed and are now being managed with a mixture of growing season and dormant season fire. Continued management of these communities and management of scrub and scrubby flatwoods should provide conditions that result in an increasing bobwhite population. Frequent application of prescribed fire (i.e., 2-3 year interval) in flatwoods communities and the appropriate thinning of pines are important when managing for this species. These actions should stimulate vegetative growth and produce a desirable groundcover of grasses and legumes. Reducing palmetto coverage to less than 30% is known to benefit Northern bobwhite and other grassland birds. To better meet the needs of this species, we recommend the OBVM DFC for palmetto cover in mesic flatwoods be reduced from the current range of 20 - 50% to 20 - 40% ([Section 4.2.1](#)).

[Section 4.3.8](#) contains additional land management recommendations and [Section 5.2.4](#) contains monitoring recommendations.

Ongoing management that emphasizes the use of prescribed fire in GRWMA's natural communities should increase suitable habitat for bobwhite; no SMA is recommended. No species management actions are recommended at this time. The area goal is to maintain a steady or increasing population of this species on GRWMA. The measurable objective is to:

- 1) Continue using breeding season point counts (i.e., whistle counts) to track changes in relative abundance of the bobwhite population on GRWMA until the WCPR strategy is updated.

3.2.10: Painted Bunting

Painted buntings are occasionally seen on GRWMA and the adjacent GTMNERR. Nesting is known to occur on GTMNERR; therefore it is likely that nesting also occurs on GRWMA. GRWMA is surveyed annually by FWR1 staff as part of a larger United States Geological Survey Painted Bunting survey effort. There are currently 6 survey points on GRWMA and several other points within several miles of the area. This survey acts as a range-wide monitoring event to track the general distribution of this species along the Atlantic coastline. It is not intended to and does not provide specific information about a particular area like GRWMA. Further, this range-wide monitoring effort is scheduled to end in 2010. In 2008 and 2009, no birds were detected via the survey on GRWMA, although area staff have seen birds on-site since that time. Habitat requirements for this species are not well understood; generally scrub, maritime hammocks, roadside thickets, fallow fields, old citrus groves, and shrubby areas are potential habitat. Birds may use pine-oak habitats that have open canopies.

The painted bunting is a high statewide priority and triggers 4 of 6 statewide prioritization parameters (high Millsap supplemental score, low Legacy population status and declining population trend, and probability of a 50% decline on public lands). On GRWMA, models indicate 663 acres of potential habitat within existing natural communities. This is some of the largest contiguous acreage of potential habitat for this species in Northeast Florida. Because little is known about specific habitat requirements for this species in areas besides coastal strand, this estimate may under or over-estimate the true amount of habitat.

Painted buntings are management responsive, particularly in coastal strand communities and coastal flatwoods; therefore ongoing natural communities' management in scrub and flatwoods including prescribed fire and timber management should benefit this species. Additionally, GRWMA's location along the Atlantic coastline is critically important to this species. The Atlantic coastline is well-known migratory pathway for this species and nesting is known to occur on many public lands near GRWMA. Given the geographic location of GRWMA, the amount of potential habitat on-site, and the known occurrence of this species, there is a high opportunity for management to have significant impacts.

[Section 4.3.9](#) contains specific land management considerations for this species including nest protection guidance. There are no species management actions

recommended at this time. [Section 5.2.5](#) contains the monitoring recommendations to track the relative abundance of and the habitat associations of painted buntings on GRWMA. [Section 5.3.1](#) describes research needs for this species. Ongoing management of GRWMA's natural communities should maintain suitable habitat for painted buntings; therefore, there is no SMA recommended. The area goal is to promote suitable foraging and nesting habitat that will allow painted buntings using GRWMA to function as part of a larger, regional population. However, the continued presence of this species on GRWMA likely depends on conditions that influence the regional population of painted buntings. The measurable objective is to:

- 1) Annually monitor painted buntings on GRWMA to track their relative abundance until the next WCPR strategy is updated.

3.2.11: Southern Bald Eagle

Bald eagles are commonly observed on GRWMA, and nesting has been documented. There are at least 3 bald eagle nests on GRWMA and all of these were active in 2008. Since 2005, GRWMA has averaged 1.75 active nests per year with increasing activity in 2007 (2 active nests) and 2008 (3 active nests). This species uses a number of natural communities and is not considered management dependent, though it does benefit from active management to restore natural communities provided nest protection guidelines are followed. The best nesting habitat occurs in forested areas close to open water.

The bald eagle triggers 0 of 6 statewide prioritization parameters. While both the FWC and the US Fish and Wildlife Service recently removed this species from the threatened species list, there is a State management plan to guide the continued recovery of the species and the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act provide protections for the species. On GRWMA, models indicate 1,476 acres of potential habitat within existing natural communities. GRWMA is ideally located for this species as it is located between the Intracoastal Waterway and the Atlantic Ocean, and because Guana Lake is a major feature on the area. All of these water bodies suggest GRWMA has high potential to continue to serve as foraging and nesting habitat for the bald eagle.

Given the generalist nature of this species and its high mobility, it is not considered management dependent and the opportunity for management on GRWMA to have a significant impact on this species is low. Ongoing management to restore natural communities' structure and function should continue to benefit this species. Management considerations around nest sites will be in accordance with the FWC bald eagle Management Plan ([Section 4.3.10](#)). Other than consideration of nest sites during management, there is no species management necessary for this species on the area at this time. Documentation and reporting of nesting sites is recommended ([Sections 5.2.8](#) and [6.1.3](#)).

Because the species is not management responsive, no SMA or measurable objective is recommended. The area goal is to promote suitable foraging and nesting habitat for the bald eagle that will allow individuals using GRWMA to function as part of a regional population. As it is unlikely any single WMA could independently

sustain a population of bald eagles, the continued presence of bald eagles on GRWMA is dependent on conditions that influence the regional population.

3.2.12: Wading Birds

The wading bird group consists of 8 species that were modeled as 1 group. Six of 8 species (great egret [*Ardea alba*], snowy egret [*Egretta thula*], little blue heron [*Egretta caerulea*], white ibis [*Eudocimus albus*], roseate spoonbill [*Platalea ajaja*], and wood stork [*Mycteria americana*]) are commonly seen on GRWMA. The other 2 species, reddish egret (*Egretta rufescens*) and tricolored heron (*Egretta tricolor*), are occasionally seen on GRWMA. Wood storks have historically nested on-site and 3 mixed-species colonies are located on GRWMA.

The wading bird group is a medium statewide priority. Several species are state listed species of special concern and the wood stork is state and federally listed as endangered. The Millsap biological scores for the reddish egret, little blue heron and wood stork are high. The snowy egret, little blue heron, and roseate spoonbill are believed to have declining population trends while the tricolored heron and white ibis have unknown trends. On GRWMA, models indicate 3,133 acres of potential habitat within existing natural communities. Similar to the bald eagle, GRWMA is ideally located for these species due to its location between the Intracoastal Waterway and the Atlantic Ocean, and because Lake Guana is a major feature on the area. All of these water bodies and adjacent forested communities suggest GRWMA has high potential to continue to serve as foraging and nesting habitat for wading birds. Presence of a dam structure on the south end of Guana Lake allows for water manipulation to benefit these species and other migratory waterfowl and shorebirds. Removal of this structure would limit the ability of GRWMA to take specific actions to benefit these species.

This group of species is of high priority on GRWMA due to their current use of the area and the amount of potential habitat. However, the opportunity for management to have significant impacts is moderate because these species are highly mobile and influenced by actions occurring at the regional scale. Ongoing natural communities' management including use of prescribed fire in basin marsh and other wetland systems should continue to enhance foraging habitat for this group of species. Continued water manipulation of both freshwater impoundments and the brackish Guana Lake during summer months also should continue to provide suitable foraging and nesting habitat for these species. Further communication with FWRI wading bird biologists is recommended (see [Section 6.1.3](#)) to answer any specific questions about water manipulation for these species.

Because ongoing management actions should be adequate to maintain appropriate habitat conditions, no SMA is recommended. If nesting is documented, land management actions should be planned to avoid disturbance of these sites ([Sections 4.3.11](#)). Monitoring to track seasonal use of Guana Lake by wading birds in response to water manipulation is recommended (see [Section 5.2.6](#)).

The area goal is to promote suitable nesting and foraging habitat for wading birds that will allow individuals using GRWMA to function as part of the regional populations. The measurable objectives are:

- 1) Develop and initiate a wading bird/waterfowl survey on Guana Lake by end of 2009.
- 2) Repeat this survey on an annual basis to track species composition and relative abundance or density for these species over time.

As it is unlikely any but the largest of WMAs could independently sustain a population of various wading birds, the continued presence of wading birds on GRWMA is dependent on conditions that influence the larger, regional population.

3.2.13: Florida Mouse

The Florida mouse was documented on GRWMA in 2002. Two encounters were recorded along a trapline located within scrub during 1 trap session. It is not known if the same individual was captured twice or if 2 unique individuals were documented. Extensive surveys for this species have not occurred. This species is most commonly found in fire-maintained, xeric uplands that have well-drained sandy soils. Abundance of Florida mice is highest in areas supporting early successional vegetation shortly after fire; populations decline as natural communities become more densely vegetated, shadier, and more mesic. Management of scrub and scrubby flatwoods consistent with the needs of Florida scrub-jays creates suitable habitat for this species. The Florida mouse is considered an obligate commensal of the gopher tortoise, and may not be able to persist on sites where tortoises are absent.

The Florida mouse is a high priority and triggers 4 of 6 statewide prioritization parameters (a high Millsap supplemental score, a Legacy declining population trend, a high rate of population decline and low proportion of populations persisting on public lands). On GRWMA, models indicate 833 acres of potential habitat within existing natural communities. Literature suggests 75 – 200 acres are needed to support a viable population. Thus, with appropriate management, GRWMA could likely support a viable population of Florida mice.

This species is management responsive, there is adequate habitat on-site, and there is good opportunity for management on GRWMA to have significant impacts; therefore it is considered a medium opportunity species. As with other species, isolation from mainland populations is a factor that could limit GRWMA's ability to have significant impacts on Florida mouse conservation in the long-term. This species is unlikely to disperse through development and the Intracoastal Waterway to GRWMA if a catastrophic event should impact the local population. Ongoing natural communities' management in GRWMA's scrub and scrubby flatwoods will provide habitat benefits to Florida mice. No other specific land management or species management actions are necessary for this species at this time. Examination and further study of the specific habitat requirements of Florida mice is a recommended research need (see [Section 5.3.2](#)). [Section 5.2.7](#) contains monitoring recommendations to document the distribution of this species on GRWMA and to track this distribution over time.

Because ongoing natural communities' management of scrub and scrubby flatwoods on GRWMA will be adequate, no SMA is necessary. The area goal is to

maintain a viable population of Florida mice on GRWMA. The measurable objectives are to:

- 1) Determine the presence and general distribution of Florida mice on GRWMA by completing a baseline survey by 2012, and
- 2) Continue to track the species' distribution on the WMA by monitoring every 5 years within suitable habitat until the WCPR strategy is updated.

3.2.14: Limited Opportunity Species

Five focal species (Florida pine snake, red-cockaded woodpecker, Anastasia Island beach mouse, Florida black bear, Sherman's fox squirrel) modeled (through the PLCP process) to have potential habitat on GRWMA lack reasonable opportunity for management on the area. Opportunistic monitoring is recommended to detect these species should they be seen on GRWMA (see [Section 5.2.8](#)). Should any of these species be documented with increasing regularity, or under conditions that warrant it, GRWMA's role in their conservation and recovery should be re-visited.

Florida Pine Snake - It is unknown whether the Florida pine snake currently occurs on GRWMA. Pine snakes typically occupy locations with sandy soils that are dominated by pines and a well-developed groundcover, though they have been documented in a number of plant communities. While scrub and scrubby flatwoods exist on GRWMA, it is unlikely this species occurs on-site because there is no sandhill, the amount of xeric uplands is limited compared to the needs of the species, and GRWMA is isolated from other xeric uplands. Pocket gophers (*Geomys pinetis*) which serve as a major food source and whose mounds provide refuge do not occur on GRWMA. On GRWMA, models indicate 765 acres of potential habitat within existing natural communities. Literature suggests that areas with 2,400 acres of suitable habitat have the best potential to support viable populations of Florida pine snakes. This acreage requirement is greater than the amount of potential habitat on GRWMA, which suggests a resident population is unlikely. Thus, while the Florida pine snake is management responsive and of moderate statewide priority, it has not been documented on GRWMA and there is little opportunity for local management to have significant impacts. It is therefore not a species of management focus on GRWMA.

Red-Cockaded Woodpecker - Red-cockaded woodpeckers have not been detected on GRWMA. The nearest known population is on D-Dot Ranch, private land located approximately 5 miles to the northwest of GRWMA. This cavity-nesting species is dependent on mature pine uplands with limited understory maintained with prescribed fire. On GRWMA, models indicate 2,148 acres of potential habitat within existing natural communities. Much of this potential habitat, however, is mesic flatwoods that is currently unsuitable for this species because it is too young to meet the needs of the species. Additionally, pine basal areas in mesic flatwoods located in the northeast portion of GRWMA are too high for appropriate woodpecker habitat. While red-cockaded woodpeckers are management responsive and there is enough potential habitat to eventually support 10-15 clusters on GRWMA, there are local considerations that make this a species of low management opportunity. First, red-cockaded woodpeckers are not likely to naturally re-colonize GRWMA. Second,

potential habitat on GRWMA occurs in a north to south linear arrangement that is not ideal for demographic connectivity. Additionally, the local GRWMA population would be isolated from other populations by the Intracoastal Waterway to the west and development to the north and south. Finally, the local population on GRWMA would always be subject to severe population declines or even extirpation from tropical storms and hurricanes. For these reason, even though there is enough potential habitat to consider creating a small population through translocation efforts, GRWMA is not a good location and this species is not a species of management focus for the area.

Anastasia Island Beach Mouse - Anastasia Island beach mice do not occur on GRWMA. Beach mice occur on primary coastal dunes dominated by herbaceous vegetation, or on secondary dunes (or coastal strand) dominated by more shrubby vegetation. Neither of these natural communities occurs on GRWMA. Historically, this subspecies of beach mouse occurred along the Atlantic coastline and a small population was released on the GTMNERR in 1992. However, beach mice were last detected on GTMNERR in 2006 and park biologists believe the population has become extirpated. On GRWMA, models using statewide landcover data identified 320 acres of potential habitat. However, using the same model with area-specific natural community data resulted in 0 acres of potential habitat on GRWMA. Field visits verify the natural community based model is the more accurate model. Because there is no beach mouse habitat on GRWMA, this species is not a focal species on GRWMA.

Florida Black Bear - Florida black bears infrequently use GRWMA; bear tracks are rarely documented on the area. It is likely a few individuals forage in GRWMA while moving through the larger landscape. This species requires a mosaic of natural communities to meet nutritional and reproductive needs. Optimal bear habitat in Florida has been described as a mixture of flatwoods, swamps, scrub oak ridges, bayheads, and hammock habitats, thoroughly interspersed. Continued use of prescribed fire and actions to reduce the amount of shrubby areas to benefit other focal species will reduce potential denning habitat. These same actions should maintain or possibly enhance foraging habitat for the Florida black bear, and potential denning habitat will remain in fire shadows and other appropriate locations. On GRWMA, models indicate 3,586 acres of potential habitat within existing natural communities. These numbers are too small to support a black bear population as literature suggests bears need forest patches > 24,000 acres for population persistence. Because of the low amount of potential habitat and the fact that this species is not management dependent, Florida black bears are not a species of management focus on GRWMA.

Sherman's Fox Squirrel - Fox squirrels have not been documented on GRWMA. While robust efforts to document their presence have not been attempted, this species is readily observed when present. Suitable habitat for fox squirrels includes longleaf pine (*Pinus palustris*) sandhills or flatwoods with the best habitat in areas with a mixture of pines and oaks, such as along the edges of longleaf pine savannas and live oak (*Quercus virginiana*) forests. On GRWMA, models indicate 1,238 acres of potential habitat within existing natural communities. Little is known about the minimal acreage requirements for a viable population, however this species

is known have a large home range, and occurs in low densities. These traits are typical of species that require large tracts to support viable populations. While this species is management responsive, due to the limited amount of potential habitat on the area, the fact that the species is not known to be present and the low likelihood of immigration, there is little opportunity for management to have significant impacts for this species on the area. GRWMA is bordered by the Intracoastal Waterway to the west and increasing development to the north and south; both of which are significant barriers to movement by this species. Due to these factors, this species is not a species of management focus on GRWMA.

3.2.15: Other Imperiled Species

Excepting the listed species discussed above, the West Indian manatee (*Trichechus manatus*), American alligator (*Alligator mississippiensis*), eastern indigo snake (*Drymarchon corais couperi*), Southeastern American kestrel (*Falco sparverius paulus*), piping plover (*Charadrius melodus*), least tern (*Sterna antillarum*), and American oystercatcher (*Haematopus palliatus*) are other listed wildlife species documented on/near GRWMA. Ongoing management to maintain healthy wetland and aquatic habitats should ensure the continued or potential use of GRWMA by West Indian manatee, alligator, piping plover, least tern, and American oystercatcher. The FWC conducts alligator monitoring on GRWMA using spotlight surveys as part of the statewide alligator monitoring that supports the regulation of alligator harvests, and the population of alligators on GRWMA does sustain an annual harvest.

Southeastern American kestrels are recorded as occurring on GRWMA in the Conceptual Management Plan approved in 2002. It was not modeled to occur on the area through the PLCP process. Discussions with area staff, verify kestrels do not occur on the area during the summer months. As such, kestrels occurring on GRWMA are probably migratory American kestrels (*F. sparverius*) and not the southeastern subspecies. Ongoing management actions on GRWMA are adequate for maintaining suitable habitat should any Southeastern American kestrels be detected.

Occurrence information and natural communities data suggests the eastern indigo snake may occur on or near GRWMA. However, the same conditions that limit the potential of the area to support pine snakes likely limit the potential of the area to support indigo snakes. Ongoing natural community management will enhance and/or maintain habitat for indigo snakes. If eastern indigo snakes are detected on GRWMA this will be documented ([Section 5.2.8](#)).

Imperiled plant species known to occur on GRWMA from rare plant surveys include angle pod (*Matelea gonocarpus*) and pondspice (*Litsea aestivalis*). Angle pod is commonly found in mixed hardwood forests, stream edges, and floodplain forests. Its persistence on GRWMA likely will continue due to the protection from habitat modification and collection associated with state-owned lands. Pondspice is a deciduous shrub found in wet areas of the outer Coastal Plain. It is most commonly found along margins of swamps, cypress ponds, and depressional ponds. Its persistence on GRWMA likely will continue due to the protection from habitat modification and collection associated with state-owned lands. One specific

recommendation to protect this species is to avoid drainage of sites where it is known to occur. Appropriate steps will be taken to ensure chemical and mechanical treatments do not negatively impact specific sites known to support these species.

Additional imperiled species are likely to occur on GRWMA in addition to the species described above. All of these imperiled species will continue to benefit from FWC's ongoing management actions that aim to restore natural communities' structure and function. Any imperiled species that might occur on GRWMA are adapted to the natural communities found in Florida and have a higher probability of persistence under FWC management actions than in the absence of management or the protections afforded by State conservation lands.

Section 4: Land Management Actions and Considerations

While 16 focal species were modeled to have potential habitat on the area ([Section 3.1](#)), not all of these species have the same level of management opportunity or need ([Section 3.2](#)). FWC's natural communities' based management, which emphasizes frequent growing season prescribed fire, will promote the habitat conditions necessary for most of these species, without the need for further strategic management actions.

Occasionally it is beneficial to identify areas in need of specific actions. The designation of SMAs allows for identification of an area in which a specific land or species management action(s) can be taken to facilitate conservation of a species or group of species. SMAs are areas in which specific actions will occur that typically will not occur area-wide. SMAs can be used to:

- Identify the area in which to apply specific land or species management that creates the highest probability for persistence/conservation of a species/suite of species. These specific actions may aid in restoring, enhancing or maintaining the habitat or population.
- Identify an area in which to focus specific management actions (land management or species management) for the best chance of success on large areas with more restoration/enhancement than can be accomplished in short order. 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 critical areas that are essential to the persistence of a focal species to ensure protection against negative alteration.
- Focus efforts on restoration/enhancement of a natural communities' that will benefit a priority species or a group of focal species. The SMA should identify the area in which these actions have the greatest positive impact for the species of interest.
- Identify areas that are more critical for research or monitoring.
- Recommend OBVM DFCs in a specific area to benefit a focal species when changing the DFCs in the natural communities' area-wide is undesirable.

The DFCs established via the OBVM process often are a range of values that will accommodate the needs of a number of species. Some species require a more specific range of preferred habitat parameters than those generally applied via OBVM or require habitat

parameters that may not have been included in the initial OBVM DFCs. In order to ensure land management efforts positively impact specific species, more specific DFCs in specific natural communities' and management units may be suggested in the SMAs ([Section 4.1](#)). When there are new OBVM vegetative parameters that need to be considered, or parameter values that need modification that can be applied area-wide, these are identified in [Section 4.2](#).

Some species have specific protective measures or land management considerations that are necessary to ensure their continued use of the property. These are prescribed in [Section 4.3](#).

4.1: Strategic Management Areas

While the intent on GRWMA is to restore all restorable natural communities to a more natural condition that will better suit these species, SMAs allow identification of areas in which to focus specific actions. The WCPR process resulted in the identification of 1 SMA to be established on GRWMA. For each SMA, goals, objectives and strategies were developed to guide management. In this document, goals, objectives and strategies are defined as follows: goals are broad statements of a condition or accomplishment to be achieved in the future; goals may be unattainable, but provide direction and inspiration. Objectives are a measurable, time-specific statement of results that responds to pre-established goals. Strategies are the actions that will be taken to accomplish a goal or objective, and strategies may be measurable.

4.1.1: Scrub Management Research

A SMA for scrub ([Figure 1](#)) was designated to focus attention on the need to experiment with different management techniques within scrub on GRWMA to attain desired management outcomes. Historically, scrub on GRWMA has been mechanically treated with heavy-duty mowing or roller chopping followed by a prescribed burn. Mechanical treatments were necessary to reduce fuel loads prior to the first burns after state acquisition. Unfortunately, the scrub that regenerated after these initial treatments did not carry fire and mechanical treatments were again necessary to continue a prescribed fire program. This technique has been successful for resetting succession but it has promoted uniform vegetation height and distribution within management units. Preferred scrub management provides variation in vegetation heights and patchiness in the distribution of open ground, herbaceous species, and scrub oaks. On GRWMA, it has been suggested that alternative methods of mechanical treatments (i.e., sloppy roller-chopping, mowing strips, or mowing perimeters) should be used in concert with prescribed fire to produce more diversity in vegetation heights, open ground, and to increase plant species diversity. This patchiness, in turn, may provide more suitable habitat for focal wildlife species like gopher tortoise, gopher frog, and Florida mouse. Ideally, scrub on GRWMA could eventually reach a point where it can be maintained with minimal mechanical disturbance prior to prescribed fire.

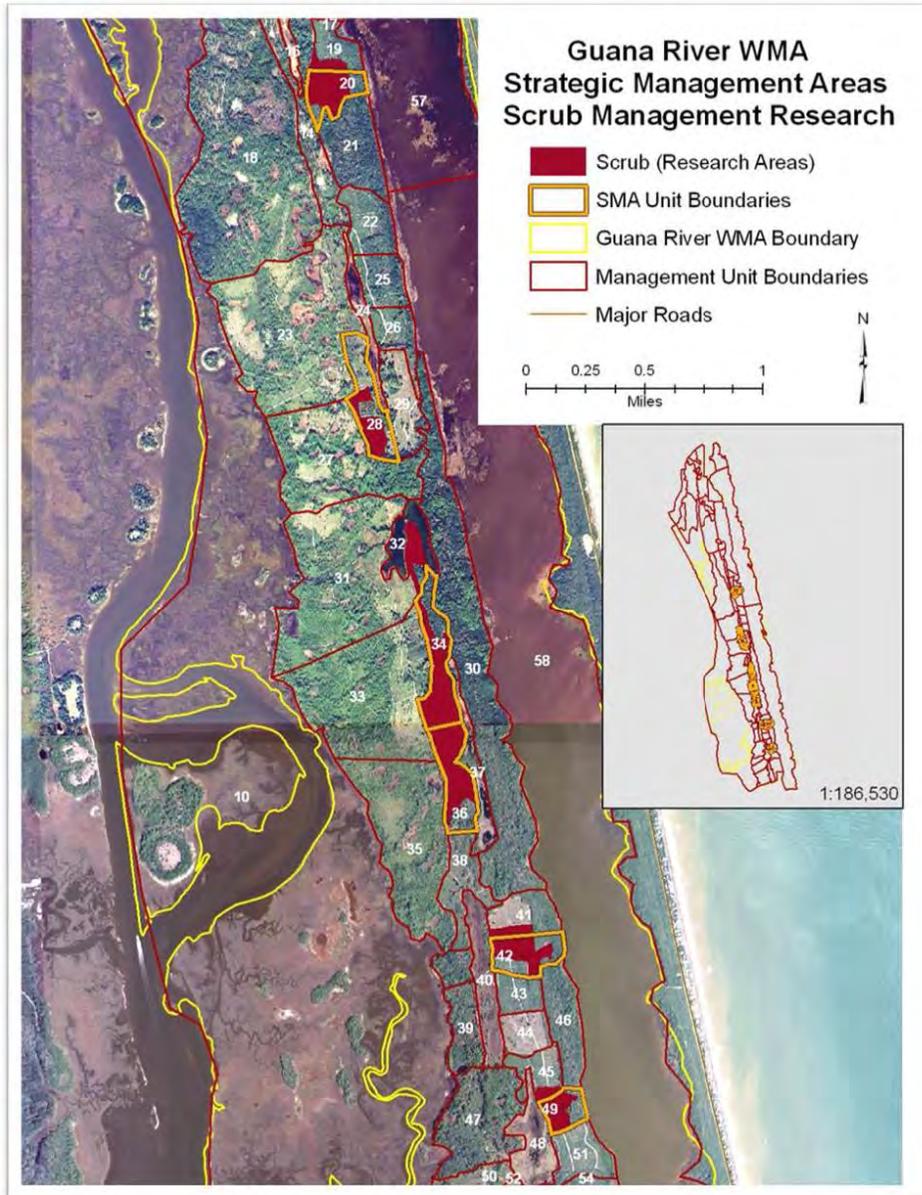


Figure 1: Management units associated with Scrub Management Research SMA on Guana River WMA.

Given the amount of coastal scrub on GRWMA, and the lack of Florida scrub-jays, which can influence the opportunity for management experimentation, there is an excellent opportunity to study how different management techniques influence this scrub. This research could help identify a management technique that reduces our dependence on mechanical disturbance prior to applying prescribed fire. Results from this research will evaluate the response of scrub vegetation and scrub-dependent wildlife to different mechanical management techniques followed by prescribed fire. This research will benefit other land managers in Florida that are responsible for management of coastal scrub communities.

SMA Goal: Use an experimental approach to develop a better understanding of how to manage coastal scrub for scrub-dependent wildlife.

SMA Objective: Develop and initiate a research project to examine vegetative and wildlife response to different management techniques within selected patches of GRWMA scrub by 2011.

Description of the SMA: The SMA focuses on 6 discrete patches of coastal scrub well distributed throughout GRWMA with a total area of roughly 137 acres ([Figure 1](#)). The mean area for these patches is 22.8 acres with each patch operating as a unique management unit. To date, all of these patches have similar management histories (i.e., complete mowing followed by a prescribed burn).

Strategy: Use of these discrete patches in a research context has several advantages. First, experimental treatments completed in these patches will occur at the management unit level, which should make planning and implementation easier. There will be no need to separate or isolate smaller subplots from the larger management unit. Second, actions taken at the management unit level are likely to occur at a scale to which wildlife will respond unlike smaller subplots. Because of this, responses by wildlife to management are more likely to be attributable to the action undertaken and not an unknown variable. Thirdly, OBVM vegetation sampling already occurs at the level of the management unit; it is possible the vegetative data collected for this research could be collected as part of this ongoing monitoring program on FWC's WMAs. Additional vegetation data could be recorded by request once methodologies are fully developed.

The full scope of this research and associated methodologies are currently being developed with research staff at FWRI. The research will focus on examining vegetation and wildlife response to the use of alternative mechanical treatments and subsequent prescribed fire within these management units. Prior to implementing the alternative treatments, data will be collected on vegetation characteristics and an appropriate measure of wildlife use (currently being developed). After treatments are completed, a follow-up assessment of vegetation composition and structure will be completed and likely repeated on an annual basis to track changes. Wildlife use will be monitored after the treatments occur and likely repeated on an annual basis to track changes. Ideally, this project should provide for a second treatment within the management units and subsequent monitoring allowing for documentation of long-

term impacts to vegetation and wildlife. Thus, the expected duration of this project is 10-12 years or longer. If any of the alternative treatments produce vegetative conditions outside of OBVM DFCs, area managers should take appropriate action to move management units back to appropriate conditions at the end of this research.

The vision for this research is to identify a management regime that will reduce the dependence on mechanical treatment prior to the use of prescribed fire. If one of these alternative treatments produces desirable vegetation conditions and shows a favorable wildlife response, it should be fully implemented on the remainder of GRWMA's scrub communities. To identify which, if any, of these techniques is most appropriate, data on vegetative structure and composition of scrub treated with different management techniques will be compared to the measure of wildlife use.

4.2: Objective-Based Vegetation Management Considerations

Objective-Based Vegetation Management (OBVM) will be used to monitor progress towards Desired Future Conditions (DFCs) of various natural community parameters. As such, OBVM will be effective in monitoring progress towards land management strategies. The OBVM DFCs ([Table 2](#)) were designed to target a range in values for various habitat parameters within actively managed communities. If habitat parameters important to a particular species are not currently monitored as part of OBVM, suggestions are made as to which parameters should be added ([Section 4.2.1](#)). If the needs of the species require a change in the DFC area-wide, this is recommended in [Section 4.2.1](#).

Table 2. Current Desired Future Conditions for specific vegetative parameters in actively managed natural communities at Guana River WMA. Basin Marsh parameters are measured at the community level. All others are measured at the management unit and natural community level.

Mesic Flatwoods	Pine Plantation
Pine basal area: 20 – 70 sq.ft / acre	Pine basal area: 20 – 70 sq.ft/acre
Shrub cover: 30 – 75%	Shrub cover: 30 – 75%
Average maximum shrub height: 2 – 5 ft	Average maximum shrub height: 2 – 5 ft
Palmetto cover: 20 – 50%	Palmetto cover: 20 – 50%
Average maximum palmetto height: 1 -3 ft	Average maximum palmetto height: 0 -3 ft
Herbaceous cover: \geq 25%	Herbaceous cover: \geq 25%
Weedy & exotic element cover: < 20%	Weedy & exotic element cover: < 20%
Scrubby Flatwoods	Scrub
Pine basal area: 10 – 50 sq.ft / acre	Shrub cover: 60 – 90%
Shrub cover: 40 – 80%	Average maximum shrub height: 3 – 9 ft
Average maximum shrub height: 3 -7 ft	Bare ground cover: 10 – 30%
Palmetto cover: 20 – 40%	Weedy & exotic element cover: < 20%
Average maximum palmetto height: 1 – 4 ft	
Herbaceous cover: 5 – 50%	
Bare ground cover: 5 - 15%	
Weedy & exotic element cover: < 20%	
Small Inland Fresh Water Ponds	Diego Tidal Pond
Tree density, exclusive of a 10' shoreline buffer: 0	Tree density, exclusive of a 10' shoreline buffer: 0
Shrub cover, exclusive of a 10' shoreline buffer: < 1%	Shrub cover, exclusive of a 10' shoreline buffer: < 5%
Cattail cover: < 1%	Cattail cover: < 1%
Emergent herbaceous vegetation cover: 25 – 75%	Emergent herbaceous vegetation cover: 10 – 30%
Exotic element cover: < 20%	Exotic element cover: < 20%
Species composition listed	Species composition listed
Guana Lake Impoundment, North of 6-mile landing	
Tree density, exclusive of a 10' shoreline buffer: 0	
Shrub cover, exclusive of a 10' shoreline buffer: < 1%	
Emergent herbaceous vegetation cover: 25 – 75%	
Cattail cover (as % of emergent vegetation): < 75%	
Exotic element cover: < 20%	
Species composition listed	

4.2.1: Modifications to Desired Future Conditions

Scrub:

Herbaceous cover (%) (New parameter to be added):

All Management Units: >10% cover

Justification: Gopher tortoise and other scrub-dependent wildlife species are dependent on diverse herbaceous ground cover for foraging. Adding this parameter will allow OBVM monitoring to track the availability of these resources for focal species.

Shrub cover (%):

All management units: change from 60 - 90% to 40 - 60%

Justification: Gopher tortoise and other scrub-dependent wildlife species prefer habitats with a patchy distribution of open ground and diverse herbaceous ground cover. Reductions in shrub cover will allow more sunlight to reach the ground and increase the diversity of herbaceous vegetation for focal species. Changing the value of this parameter will allow OBVM monitoring to track habitat conditions for focal species.

Mesic Flatwoods:

Shrub cover (%)

All management units: change from 30 - 75% to 30 - 50%

Justification: Gopher tortoise and grassland birds occupying flatwoods prefer habitats with a patchy distribution of open ground and diverse herbaceous ground cover. Reductions in shrub cover will allow more sunlight to reach the ground and increase the diversity of herbaceous vegetation for focal species. Changing the value of this parameter will help ensure habitat conditions meet the needs of these focal species.

Palmetto cover (%)

All management units: change from 20 - 50% to 20 - 40%

Justification: The northern bobwhite and a number of grassland birds benefit from reduced palmetto cover. Northern bobwhite prefer palmetto cover to be < 30%. Reducing the upper value will bring the parameter closer to the preferred range and within the acceptable range for the bobwhite and a number of other species.

Pine Plantation:

Shrub cover (%)

All management units: change from 30 - 75% to 30 - 50%

Justification: Gopher tortoise and grassland birds occupying flatwoods prefer habitats with a patchy distribution of open ground and diverse herbaceous ground cover. Reductions in shrub cover will allow more sunlight to reach the ground and increase the diversity of herbaceous vegetation for focal species. Changing the value of this parameter will help ensure habitat conditions meet the needs of these focal species.

Palmetto cover (%)

All management units: change from 20 – 50% to 20 – 40%

Justification: The northern bobwhite and a number of grassland birds benefit from reduced palmetto cover. Northern bobwhite prefer palmetto cover to be < 30%.

Reducing the upper value will bring the parameter closer to the preferred range and within the acceptable range for the bobwhite and a number of other species.

4.3: Further Land Management Considerations

It is commonly believed that most species will benefit from management that restores the natural structure and function of natural communities they use. However, for some species, specific management recommendations and precautions are necessary to ensure the continued suitability of the area for the species. The following recommendations should help ensure GRWMA continues to fulfill its role in the conservation of these species.

4.3.1: *Gopher Frog/Striped Newt*

These species frequently move between wetland breeding ponds and adjacent uplands; firebreaks should not be placed along wetland ecotones because they can alter/destroy the herbaceous component of pond margins preferred by these species and other amphibians. Prescribed fire should be the primary tool to remove shrubs and other thick vegetation from pond margins; mechanical and chemical treatments should be used sparingly to reduce effects on this species. Due to the importance of maintaining potential breeding ponds in good condition, the prohibition on ORV use should be continued. Silvicultural activities (i.e., timber cutting) around known or potential breeding ponds should focus on selective thinnings and natural regeneration enhanced by prescribed fire. Do not rely on natural regeneration if off-site pines dominate the site; consider hand planting if possible or mechanical planting with low ground pressure equipment.

4.3.2: *Gopher Tortoise*

To the extent possible, plan for roller-chopping or other mechanical treatments to occur during the dormant season to minimize potential negative impacts to gopher tortoises. This species is typically less active and spends more time in burrows during the winter months. Therefore, roller-chopping or mowing at this time will be less likely to crush or otherwise harm tortoises. Regardless of timing, make an effort to minimize impacts on known burrows.

4.3.3: *Swallow-Tailed Kite*

Because swallow-tailed kites exhibit high nest site fidelity, protect any known nest sites from disturbance and alteration. Retain all of the tallest pines in the area of nest sites. When possible, kite nesting areas should be allowed to have a higher shrub height and density than surrounding areas as this may reduce the likelihood of nest predation. If kite activity is observed during nesting season, particularly if kites are observed carrying nesting material, mobbing, or congregating in groups of 3 or more,

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

4.3.4: *Bachman's Sparrow*

Prescribed fire improves the quality of habitat for Bachman's sparrows, and is the primary land management tool recommended to promote habitat on GRWMA. Suitable habitat can be created/maintained through frequent (≤ 3 year rotation) use of prescribed fire. The occurrence of fire is critical to sustaining this species as use of an area by Bachman's sparrows declines rapidly around 18 months post-fire, and Bachman's sparrows may abandon habitat if fire is excluded for more than 3 years. When mechanical treatments are used to reduce understory, an effort should be made to retain some small patches of shrubs, which are used by singing males as singing perches during the breeding season. The treatment should be followed with a prescribed burn.

4.3.5: *Brown-Headed Nuthatch*

This species is a cavity nester and is dependent on the presence of snags for suitable nesting habitat. As such, an effort should be made to retain snags during management operations. The impact of management activities on snags should be evaluated to ensure consumed snags are being replaced by new 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 snag.

If brown-headed nuthatches are documented in any management unit in GRWMA during the breeding season, an effort should be made to avoid prescribed fire during February and March in the management unit. The loss of nests early in the season frequently results in re-nesting attempts. Most re-nesting occurs during periods of increased snake activity which results in greater predation on nesting females and their eggs and young. However, if this is the only time in which suitable conditions occur for a burn, it is better to burn than to avoid burning.

4.3.6: *Cooper's Hawk*

During the nesting season (April-July in Florida), Cooper's hawks are secretive and intolerant of human disturbance near the nest site. Males show a strong fidelity to traditional territories. For this reason, whenever possible, known nesting sites should be protected from human disturbance (e.g., prescribed fire, timber thinning, mechanical treatments) by maintaining a 50-ft buffer around the nest during the nesting season, and avoiding 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.

4.3.7: Limpkin

During timber harvests, observe Best Management Practices to protect wetlands and avoid soil disturbance if there is a risk of impacting wetlands. As exotic invasive aquatic plants can have a negative impact on apple snails, document any occurrence of these species on the area and report them to the Invasive Plant Management Section ([Section 6.1.6](#)). If detected early it may be possible to eradicate invasive exotic plants before a population becomes established. The potential to have negative impacts on the limpkin can be reduced by taking actions to avoid disturbing nests, particularly identifying and protecting or avoiding these areas when conducting management activities in wetlands during nesting season (April-July). On GRWMA, management of Guana Lake, particularly the northern half, with occasional prescribed fire will benefit Limpkin by managing cattail growth and encouraging the development of emergent vegetation.

4.3.8: Northern Bobwhite

The primary land management tool used to benefit northern bobwhite is the frequent use of prescribed fire. Fires should be ignited 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 habitat requirements for northern bobwhite. Growing season fires are generally preferred. Growing season fires 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. Thin pine stands with basal areas > 80 ft²/acre to 30-40 ft²/acre to allow more sunlight to reach the forest floor. More sunlight will 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. Reducing palmetto coverage to less than 30% is known to benefit Northern bobwhite and other grassland birds. This can be accomplished through a mixture of mechanical treatments and the use of prescribed fire.

4.3.9: Painted Bunting

This species responds well to active management practices like prescribed fire, timber thinning, and maintenance of grassland-shrub transition areas (i.e., beach dunes) in appropriate sites. However, when nesting is documented, efforts to protect the nest from disturbance should be considered. This could include maintaining a 50-

ft buffer around the nest during the nesting season (May – June) or delaying actions until young have fledged.

When possible, timber thinnings in pine flatwoods should reduce the canopy cover to 50% or less. Prescribed burning in flatwoods should create a mosaic of grasses and shrubs, especially wax myrtle (*Myrica cerifera*), which painted buntings will use for nesting and foraging. In young hardwood forests, the canopy should be opened to allow grasses and shrubs to become established. Older hardwood forests (i.e., 150 – 250 years), however, need little active management because natural openings provide the necessary nesting and foraging habitat. On GRWMA, protect maritime hammocks from disturbance whenever possible.

4.3.10: Bald Eagle

State and federal law requires protection of bald eagles, including avoiding disturbance of nesting eagles. Managers will consider the management guidelines available at: http://myfwc.com/imperiledspecies/plans/Eagle_Plan_April_2008.pdf (or any subsequent version) when planning activities within 660-ft of known eagle nests and any new nests that are located. As it is undesirable to have unnaturally dense stands around eagle nests, when eagle nests occur in actively managed stands the nest buffer area should continue to be managed but with proper planning to avoid negative impacts to the eagles, per the guidance of the management plan. Older, mature trees should be protected as potential future nest sites.

4.3.11: 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. Reduce the potential to have negative impacts on these species by taking actions to avoid disturbing colonies of nesting wading birds. This is accomplished by providing a 330-ft buffer around colonies during nesting season (April-July). In areas where herbicides are used to control aggressive vegetation (i.e., cattails), the application of herbicides should be timed, whenever possible, to minimize negative impacts to wading birds known to nest in these types of vegetation. Burning of marsh communities within Guana Lake should not occur during nesting season (April-July) when possible. However, cattail can be an invasive species that can have negative impacts on wetland species composition. Therefore, management of cattails is encouraged provided nesting wading bird colony buffers are maintained (during nest season) and the scale of the project is not so large to affect a significant proportion of secretive marsh birds that use cattails for nesting.

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. However, for some species land management actions alone are insufficient in aiding recovery. Species

that are currently not present on a site and have limited dispersal capabilities are unlikely to occupy a site without re-introduction once habitat restoration is complete. Additionally, species that are currently present 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](#) discusses 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. Most land management actions, such as prescribed fire or mechanical treatments, are covered in [Section 4](#). There were no species management needs identified on GRWMA at this time.

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 GRWMA, the recommended monitoring will assess species in all actively managed communities and includes opportunistic monitoring for uncommon or rare species. Data collected will be reported to the regional conservation biologist for inclusion in the appropriate database developed for the WCPR program. Monitoring data will be made available to cooperating agencies and organizations such as FNAI ([Sections 6.1.3, 6.4, 6.5](#)).

The section provides the list of monitoring that is 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 <http://portal.fwc.state.fl.us/DOI/Divisions/HSC/THCR/wcpr/Standard%20Monitoring%20Protocols/Forms/AllItems.aspx>. 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 determine the distribution of this species on the area and to track changes in the distribution of this species in suitable wetlands over time. Call surveys will be completed following an approved protocol. The survey should be repeated on average every 3 years. However, as this species is dependent on specific weather events, the cycle of repetition may not be every 3 years and will need to follow the guidance of the protocol. As an opportunistic breeder that responds quickly to heavy rains, surveys should occur around potential wetlands after major rain events during winter/early spring months. If the species is not detected after sampling during 3 different years under favorable weather conditions monitoring can be terminated and we will presume the species does not exist on GRWMA.

5.2.2: Striped Newt Dipnet Monitoring

The purpose for monitoring this pond breeding obligate is to document breeding ponds and to monitor use of these ponds over time. Surveys following the approved standardized protocol should determine presence/absence and will not be of sufficient intensity to detect changes in relative abundance.

Surveys are conducted in years with sufficient rainfall to ensure water remains in ponds during late winter through early spring. Using the methodology and data sheets developed by the FWRI Amphibian and Reptile Research Scientist ([Section 6.1.3](#)), timed dip net searches of ponds are conducted to determine if the species is present. This protocol will provide information on the striped newt and may provide information on gopher frog use of these ponds. If both species are recorded prior to the end of allotted search time, the search is ended. Other captured species are documented. Data should be reported to the FWRI Amphibian and Reptile Research Scientist for inclusion in the database developed for the statewide monitoring effort.

This monitoring effort can be supported periodically by more intensive drift fence surveys. Drift fence surveys following standard protocol are intended to collect presence/absence information on a broad range of species, and should be repeated once every 10 years, providing resources are available.

5.2.3: Gopher Tortoise Monitoring

Previous surveys on GRWMA were conducted to evaluate the area's potential to serve as recipient sites for translocated tortoises. Area-wide surveys to document the distribution or to determine a baseline density of tortoises on GRWMA have not occurred. Once an initial area-wide survey is completed, repetition of this survey on a regular basis will allow for tracking relative abundance.

The purpose of gopher tortoise monitoring is to evaluate distribution and relative abundance trend. 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 an actual tortoise density would require determining the actual occupancy rate of burrows on the area during the survey. While this is worthwhile information, it requires additional resources and is not necessary for basic trend evaluation. We plan to repeat the monitoring effort once every 5 years. However, if funding is limited, this type of survey can be useful as long as it is repeated at least every 10 years.

5.2.4: Avian Spring Call Count Survey

The purpose of monitoring northern bobwhite, Bachman's sparrow, and brown-headed nuthatch is to establish a baseline (for Bachman's sparrow and brown-headed nuthatch) and track relative abundance over time. Surveys will be point counts spaced along a single transect that runs north to south through the center of GRWMA with 11 points that are currently used to monitor northern bobwhite. If necessary, the use of callback tapes may be incorporated into the call station protocol. On GRWMA these avian surveys will occur on an annual basis.

5.2.5: Painted Bunting Monitoring

The purpose of monitoring for painted buntings is to document presence of singing males (which usually indicates breeding) of this species on GRWMA. Following approved standard protocol, callback surveys will be used in suitable habitat during breeding seasons. To minimize observer bias, the same person should complete all surveys and each station should be visited twice during the 2-month breeding season. Any documentation of presence or nesting activity should be reported to FWRI ([Section 6.1.3](#)).

5.2.6: Wading Bird Monitoring

Wading birds are commonly seen using Guana Lake, the 2,400 acre impoundment located along GRWMA's eastern edge. Area staff expressed an interest in monitoring the species richness and abundance of different wading birds using this impoundment. In concert with FWRI avian researchers, a monitoring plan for wading birds on Guana Lake is currently being developed. The purpose of this monitoring is to document and track the different species of wading birds, and their abundance, in relation to season and water level manipulations on the impoundment. The monitoring plan has been developed and is currently in a testing phase.

5.2.7: Florida Mouse Monitoring

A Florida mouse was documented in a portion of the area's scrub in 2002. Further surveys using small mammal traps in potential Florida mouse habitat should be completed to determine presence/absence and the extent of their distribution on GRWMA. Follow-up surveys to track changes in distribution and occupancy should be completed every 5 years. A specific protocol for Florida mouse surveys is under development. The monitoring effort that is recommended is a low cost effort that is intended to provide information on the general distribution of the species and presence on GRWMA. It is not intended to provide statistically vigorous density or population size estimates, though catch per trap effort may be useful to some degree in tracking changes through time.

5.2.8: 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. Documentation of opportunistic sightings including approximate lat/long or appropriate management unit, number of individuals, behavior, and habitat type should be forwarded to the regional conservation biologist. Encounters with or sign of the following focal species should be recorded;

- Swallow-tailed kite (aggregations of 3 or more birds on regular basis in one area during spring and any nesting activity)
- Cooper's hawk (nesting activity only)
- Limpkin (nesting or occurrence of dependant young)

- Bachman's sparrow
- Red-cockaded woodpecker
- Bald eagle (report new nests; document changes to existing nests)
- Florida black bear
- Florida pine snake
- Sherman's fox squirrel
- 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 regarding management strategies for a given species. However, cases arise when little or no information is available to guide management. This section outlines research needs identified through the WCPR process.

5.3.1: Painted Bunting and Nesting Habitat

While there is information on nesting success and associated demographic parameters in coastal strand, there is little information currently available about the habitat conditions associated with painted bunting nest locations in other habitats. Painted buntings will nest in other natural communities including maritime hammock, abandoned citrus groves, and mesic flatwoods. There is a need for determining the vegetative conditions associated with nesting by this species. Research regarding the selection of habitat and nesting success under differing habitat conditions by painted buntings will provide information that can be used in managing habitat occupied by this species.

5.3.2: Florida Mouse and Optimal Habitat Conditions

Currently, there is little information on optimal habitat conditions for the Florida mouse. While xeric habitats maintained with frequent fire, some oak mast production, and gopher tortoise burrows are considered high quality habitat, there is a need for defining preferred vegetative parameters (e.g. composition of ground cover species, % ground cover, and % shrub cover) for this species. Research regarding these habitat preferences will provide information that can be used in managing habitat occupied by Florida mice.

Section 6: Intra/Inter Agency Coordination

Throughout the WCPR process many recommendations were made regarding possible management strategies for focal species. THCR staff can handle most proposed management actions; however, cases may arise when coordination with other sections in FWC or other agencies is necessary or increases efficiency. This section identifies cases in which coordination is necessary outside of THCR, identifies the entity to coordinate with, and provides position contacts for these entities.

An attempt is made 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/supervisor to determine the appropriate individual.

6.1: Florida Fish & Wildlife Conservation Commission

6.1.1: Species Conservation Planning Section (SCPS)

Monitoring animal populations on a WMA gives managers a way to gauge animal response to management. If this information is not shared with others, valuable data that can be used to assess statewide conservation efforts often is lost. Therefore, monitoring data should be shared with the appropriate taxa coordinator and program coordinator for species for which conservation initiatives or other management programs have been developed. The regional SCPS biologist is a good source of information on the regional status of non-game species. Additionally, FWC staff are authorized to handle federally listed species if it is done consistent with the requirements of the agency's Endangered Species Act Section 6 Cooperative Agreement. To meet these requirements, reporting as outlined in the Agreement will be provided to the agency's Endangered Species Coordinator.

Contacts:

Elsa Haubold, Species Conservation Planning Section Leader: 850-488-3831
Robin Boughton, Avian Taxa Coordinator: 352-732-1225
Melissa Tucker, Mammalian Taxa Coordinator: 386-758-0525 ext 114
Bill Turner, Herpetofauna Taxa Coordinator: 850-410-0656 ext 17331
Deborah Burr, Gopher Tortoise Coordinator: 850-410-0656 ext 17332
Brad Gruver, Endangered Species Coordinator: 850-488-3831
Alex Kropp, NE Regional SCPS biologist: 352-732-1225

6.1.2: Hunting & Game Management

Information gathered on northern bobwhite will be shared with the FWC small game coordinator. This will ensure the efforts on GRWMA for this species are included when evaluating agency progress towards fulfilling objectives in the statewide quail strategy.

Contacts:

Paul Schulz, Section Leader: 850-488-3831
Chuck McKelvy, FWC Small Game Program Coordinator: 850-342-0256

6.1.3: Fish and Wildlife Research Institute (FWRI)

Results from gopher frog and striped newt monitoring should be reported to the FWRI herpetologist. New bald eagle nests should be reported to the FWRI bald eagle database coordinator. Information on painted buntings should be shared with

avian researchers. Questions about managing water levels for wading birds should be directed to FWRI wading bird researchers. Jim Rodgers administers the FWC's migratory bird scientific collection permit. Report all handling of migratory birds covered by the permit to Jim in January.

Contacts:

Tim O'Meara, Section Leader: 850-488-3831
Kevin Enge, FWRI research biologist (herpetofauna): 352-955-2081
Janell Brush, FWRI research biologist (bald eagle; wading birds): 352-955-2081
Jim Rodgers, FWRI research biologist (wading birds): 352-955-2081
Mike Delaney, FWRI research biologist (painted bunting): 352-955-2081
Jeff Gore, FWRI research biologist (mammals): 850-265-3677

6.1.4: Habitat Conservation Scientific Services (HCSS)

Private lands biologists within FWC's HCSS section work to provide technical and financial assistance to landowners interested in managing their properties. These biologists are able to write management plans for landowners and can get them enrolled in cost-share programs that will offset some of the financial costs associated with land management. If private landowners near GRWMA express an interest in management of their lands, HCSS biologists should be contacted and given the landowner's information.

Contacts:

Mark Asleson, HCSS Regional Coordinator: 352-732-1225

6.1.5: Wildlife Legacy Initiative

Florida's Wildlife Legacy Initiative provides a blueprint for conserving Florida's wildlife. This program advances the conservation of Florida's wildlife by providing grants for projects and advancing partnerships. As such, the regional Legacy biologist can be a source of information on possible partnering and on information for grants to fund work called for in this Strategy.

Contacts:

Kate Haley, Program Coordinator: 850-488-3831
Adam Kent, Regional Legacy Biologist: 352-857-2482

6.1.6: Invasive Plant Management Section

The FWC Invasive Plant Management Section provides technical and financial assistance assist in the control of invasive exotic plants to area staff.

Contacts:

Jeff Schardt, Aquatics Sub-section Administrator: 850-245-2815
Greg Jubinsky, Uplands Sub-section Administrator: 850-245-2821
St. Johns River Office: 407-275-4004

6.2: Florida Department of Environmental Protection (DEP)

The DEP currently manages the Guana-Tolomato-Matanzas State Park, which lies immediately to the south of GRWMA. Opportunities to coordinate management actions or initiate monitoring/research efforts for focal species should be shared with DEP staff when appropriate.

Contacts:

Matt Love, Biological Scientist: 904-823-4500

6.3: Division of Forestry (DOF)

DOF administers timber contracts for all thinning operations on GRWMA. They also issue authorizations for prescribed burning and will assist on escaped fires. GRWMA staff should continue to coordinate timber inventories and potential thinning activities with DOF.

Contacts:

Tim Worley, State Lands Forester: 352-369-2415
Gary Carpenter, Forest Area Supervisor: 904-825-5082

6.4: St. Johns River Water Management District (SJRWMD)

The SJRWMD currently owns and manages several conservation areas that lie close to the current boundaries of the GRWMA. Opportunities to coordinate management actions or initiate monitoring/research efforts for focal species should be shared with SJRWMD staff when appropriate.

Contacts:

Steve Miller, Division Director (Land Management): 386-329-4399

6.5: Florida Natural Areas Inventory (FNAI)

FNAI maintains a database of documented sightings of rare plants and animals which are used in a number of habitat modeling procedures as well as for environmental planning and regulatory purposes by all Florida agencies responsible for natural resource protection and management. As such the regional conservation biologist will make sure that all reported opportunistic documentation of rare species as well as survey results are made available to FNAI for inclusion in these databases.

Contacts:

Dan Hipes, Chief Scientist: 850-224-8207

6.6: St. Johns County Recreation & Parks

St. Johns County Recreation & Parks is responsible for the management of the 2,400 acre Nocatee Preserve, located immediately to the west of GRWMA. Communication and opportunities to promote connectivity for focal species between GRWMA and this parcel should be encouraged.

Contacts:

Administration Office: 904-209-0333

Section 7: Beyond the Boundaries Considerations

There is enough potential habitat (with restoration and management) on GRWMA to support a population of many focal species such as the gopher frog, striped newt, gopher tortoise, brown-headed nuthatch, northern bobwhite, and Florida mouse. All of these species are dependent on the continuation of active natural community management that focuses on frequent prescribed fire. However, GRWMA cannot independently support a number of the area's focal species (e.g. the swallow-tailed kite, Cooper's hawk, Limpkin, painted bunting, bald eagle, and wading birds). Long-term persistence of these species on the area will be dependent on events that influence the regional populations.

GRWMA western boundary is the Intracoastal Waterway and the Atlantic Ocean is its eastern boundary. These geographic features, in concert with development pressures to the north and south, limit dispersal for a number of GRWMA's focal species. As such, a catastrophic storm event that causes local extirpation of species like the striped newt or Florida mouse could have long-term consequences on the species composition on GRWMA.

Water, development, and existing conservation lands surround the majority of GRWMA and there are limited adjacent private lands. However, area staff should make every effort to cooperate in the conservation of focal species with any adjacent private landowners. Coordination with HCSS will ensure willing private landowners get the proper technical assistance and are informed of incentive programs that encourage conservation-based management ([Section 6.1.4](#)). Continuing communication and education with private landowners on the importance of prescribed fire and active management of Guana Lake (i.e., water drawdowns, treatment of cattails, etc) will be essential for management of this portion of GRWMA for focal species. Saint Johns County has approved the development of Nocatee, a planned green community along the Intracoastal Waterway, immediately to the west of GRWMA. As part of this development, the 2,400 acre Nocatee Preserve was established and is managed by the county. Communications and education on wildlife issues with St. Johns County ([Section 6.6](#)) and Nocatee residents may promote opportunities to ensure some connectivity between local and mainland populations of some focal species. Continued communication with GTMNERR staff also is encouraged ([Section 6.2](#)).

While GRWMA provides an opportunity to further the conservation of many focal and imperiled species, significant changes in land use occur beyond the boundaries and can have significant impact on focal species. Extensive development increases isolation and makes management for native wildlife more problematic. Road establishment north of GRWMA has disrupted the hydrology. While FWC can communicate with parties

responsible for regional planning and water use plans, these management decisions are ultimately outside the control of the area manager.

The optimal management boundary for GRWMA has not been realized; there are two parcels under consideration for purchase; the 10-acre Thomas Frazier parcel and the 100-acre Ponte Vedra Corporation parcel. These parcels are not currently for sale. State Lands and FWC should be considerate of opportunities to expand the GRWMA boundary if these parcels become available for purchase. In addition to these parcels, efforts by the state's acquisition group to purchase or maintain conservation lands or easements immediately across the Intracoastal Waterway from GRWMA should be pursued as a potential means to maintain some connectivity for wide-ranging focal species.

Document Map

Species	Species objective	Land management actions	Species management actions	Species monitoring	Research needs	Coordination
Gopher frog	Section 3.2.1	Section 4.3.1		Section 5.2.1		
Striped newt		Section 4.3.1		Section 5.2.2		
Florida pine snake				Section 5.2.8		
Gopher tortoise	Section 3.2.3	Section 4.3.2		Section 5.2.3		
American swallow-tailed kite		Section 4.3.3		Section 5.2.8		
Bachman's sparrow		Section 4.3.4		Section 5.2.4		
Brown-headed nuthatch	Section 3.2.6	Sections 4.2.1 & 4.3.5		Section 5.2.4		
Cooper's hawk		Section 4.3.6		Section 5.2.8		
Limpkin		Section 4.3.7		Section 5.2.8		
Northern bobwhite	Section 3.2.9	Section 4.3.8		Section 5.2.4		
Painted bunting	Section 3.2.10	Section 4.3.9		Section 5.2.5	Section 5.3.1	
Red-cockaded woodpecker				Section 5.2.8		Section 6.1.3
Southern bald eagle		Section 4.3.10		Section 5.2.8		Section 6.1.3
Wading birds	Section 3.2.12	Section 4.3.11		Section 5.2.6		Section 6.1.3
Anastasia Island beach mouse				Section 5.2.8		
Florida black bear				Section 5.2.8		
Florida mouse	Section 3.2.13			Section 5.2.7	Section 5.3.2	
Sherman's fox squirrel				Section 5.2.8		

13.13 Recreation Master Plan

Recreation Master Plan for Guana River Wildlife Management Area



Florida Fish and Wildlife Conservation Commission



September 2005

DRAFT GUANA RIVER WMA RECREATION MASTER PLAN

TABLE OF CONTENTS

I. Introduction	3
Purpose of the Recreation Management Plan	3
Significance of Guana River WMA	3
II. Resource Inventory	4
Natural Communities	4
Wildlife Resources	7
Scenic Resources	7
Cultural Resources	7
Resource Management	8
III. Interpretation	10
Interpretive Themes	10
Visitor Experience Goals	10
IV. Recreation Assessment	11
Existing Recreational Use and Facilities	11
Appropriate Recreation Uses on GRWMA	17
Recreation Management Zones	18
V. Recreation Prescriptions	19
Proposed Visitor Experiences and Recreation Facilities	19
Recommended Nature-Based Recreation Goals and Objectives	22
Challenges and Strategies	24

Work Plans	25
Monitoring and Management	25
References	27
Figures	
1. Guana River WMA Natural Communities	6
2. Site Inventory	14
3. Conceptual Recreation Site Plan – North End	20
4. Conceptual Recreation Site Plan – South End	21
Appendices	
1. Recreation and Wildlife Viewing Facilities Design Guidelines	28
2. Monitoring and Management Guidelines	30
3. Sign Plan	35
4. Work Plan for Nature-Based Recreation Enhancements	36
5. Inventory Photographs	37
6. Stakeholder Comments	44

I. Introduction

Purpose of the Recreation Management Plan

The purpose of this Recreation Master Plan (RMP) is to serve as a guide for providing recreational experiences focused on wildlife viewing and nature study on Guana River Wildlife Management Area (GRWMA). The plan contains specific recommendations for recreational enhancements and interpretive products and programs. It also provides guidelines for monitoring recreation-related use to avoid negative resource impacts and to ensure satisfactory visitor experiences.

In the RMP for GRWMA, emphasis is placed on integrating recreation and interpretive planning. Using this approach, the type of recreational experience offered and the location of recreation amenities provided, is strongly influenced by the interpretive goals for the area. Recreation opportunities thus become a means to an end - reaching visitors with important concepts about an area's natural resources, plant communities, wildlife and wildlife management.

Significance of Guana River WMA

The 9,815-acre GRWMA is adjacent to the Guana-Tolomato-Matanzas (GTM) Reserve – Guana River Property. The 2,400-acre GTM Reserve – Guana River Property (a Florida Department of Environmental Protection Coastal and Aquatic Managed Area) and GRWMA are part of the larger Guana-Tolomato-Matanzas National Estuarine Research Reserve (GTMNERR). Located midway between Jacksonville and St. Augustine, the area is uniquely situated to afford outdoor recreational opportunities to a large and growing segment of Florida's population, as well as to tourists who traditionally visit the area.

The CARL committee in its project assessment prepared for the Governor and Cabinet expressed the unique character of the property:

“It is unusual for a single proposed project area to combine such a diversity of valuable natural, cultural and recreational resources. These include: (1) an unusually extensive natural area of undisturbed Atlantic coastal strand (scrub) vegetation; (2) extensive maritime hammock containing an unusual natural association of mature trees; (3) extensive estuarine wetlands (marsh); (4) extensive areas of pine flatwoods; (5) bird rookeries, including a sizable population of the endangered wood stork; and (6) extensive aboriginal middens, aboriginal burial mounds and artifacts of aboriginal and Spanish colonial (origin).” Also, on state owned land adjacent to GRWMA, there is excellent ocean-front beach with high dunes stabilized by natural vegetation;

II. Resource Inventory

Natural Communities

The diversity of natural communities is one of Guana River WMA's most striking features (Figure 1). For example, from the observation tower along Capo Road visitors can see salt marsh, maritime hammock, and pine flatwoods. These communities are highly influenced by coastal maritime conditions and are similar to the Sea Island Coastal Region of southern Georgia. The descriptions of natural communities provided below are from the 2002-2007 GRWMA Conceptual Management Plan.

Salt Marsh (2,157 acres)

The natural community of the largest extent on Guana River is salt marsh, a highly productive community that begins at headwaters of tidal creeks and drains, and gradually slopes downward toward the subtidal zone of associated rivers. This community is dominated by smooth cordgrass.

Flatwoods (1,348 acres)

Some botanists believe that most of the Guana peninsula was once covered with slash and pond pines. Currently pine flatwoods are primarily limited to the western, central, and northern portions of the area. Pine stands are also found on marsh islands within the salt marshes along the Tolomato River. Scattered pines and small stands can also be found within the maritime forests, with older stands having been invaded and replaced by hardwoods. Many of the pines were logged about 40 years ago. In 1978, slash pine plantations were established on about a third of the pine area.

Maritime Forest Hammocks (911 acres)

Extensive stands of oak hammock are located along the uplands adjacent to the west boundary of Lake Ponte Vedra. The maritime forest is a broad-leaved evergreen forest shaped by wind and salt spray and characterized by "flag-form" trees such as those along Lake Ponte Vedra. The overstory consists of live oak, laurel oak, slash pine, southern red cedar, cabbage palm, pignut hickory, southern magnolia, and red bay. The understory varies from dense stands of saw palmetto to relatively open grassy areas with a few low shrubs.

Scrub (867 acres)

Several stands of scrub exist within the WMA, probably representing a formerly more extensive stand of Atlantic coastal sand pine scrub. This community was dominated by sand pine with an understory of scrub oaks. However, the scrub on Guana River is dominated primarily by oaks of various heights, ages, and densities.

Basin Marsh (1,536 acres)

This freshwater community type includes interior impoundments, marshes and borrow areas. Vegetation is almost entirely of low-growing wetland types, but graduating into other communities (ecotones). Basin marshes have a distinctive cover composed primarily of emergent grasses and sedges, but also include a heterogeneous assemblage of leafy aquatics and various submergent species. Plant diversity and species richness are characteristically much higher than that found in brackish and estuarine marshes. There are both managed and unmanaged basin marsh communities on GRWMA.

Basin Swamp (297 acres)

Basin swamps occur on the northern portion of the property. Species diversity in these areas is low, with the overstory dominated primarily by gums, oaks and maples. This forested wetland community occurs primarily in poorly drained depressions and floodplain zones, and is largely dependent upon the hydroperiod. Basin swamps usually occur in close association with basin marsh communities. A complete survey of vegetative species occurrence on GRWMA has not been accomplished.

Prairie Hammock (195 acres)

Prairie hammocks occur on slight rises in relatively flat terrain. This community is characterized as a clump of tall cabbage palms and live oaks in the midst of prairie or marsh communities. These hammocks generally have a very open understory although saw palmetto typically rings the perimeter of these rounded clumps. Other typical plants include wax myrtle, water oak, stoppers, marlberry, pigeon plum, poison ivy, poisonwood, orchids, and wildflowers. Typical animals include box turtle, southeastern five-lined skink, black racer, and several species of shrews and rodents.

Prairie Hammocks may flood during extreme high water, but they are seldom inundated for more than 10 to 40 days each year. Oak and palm dominated Prairie Hammocks on drier sites tolerate occasional light ground fires, but more diverse hammocks rarely burn. Sites with heavy shrub layers are liable to be severely damaged by a canopy fire.

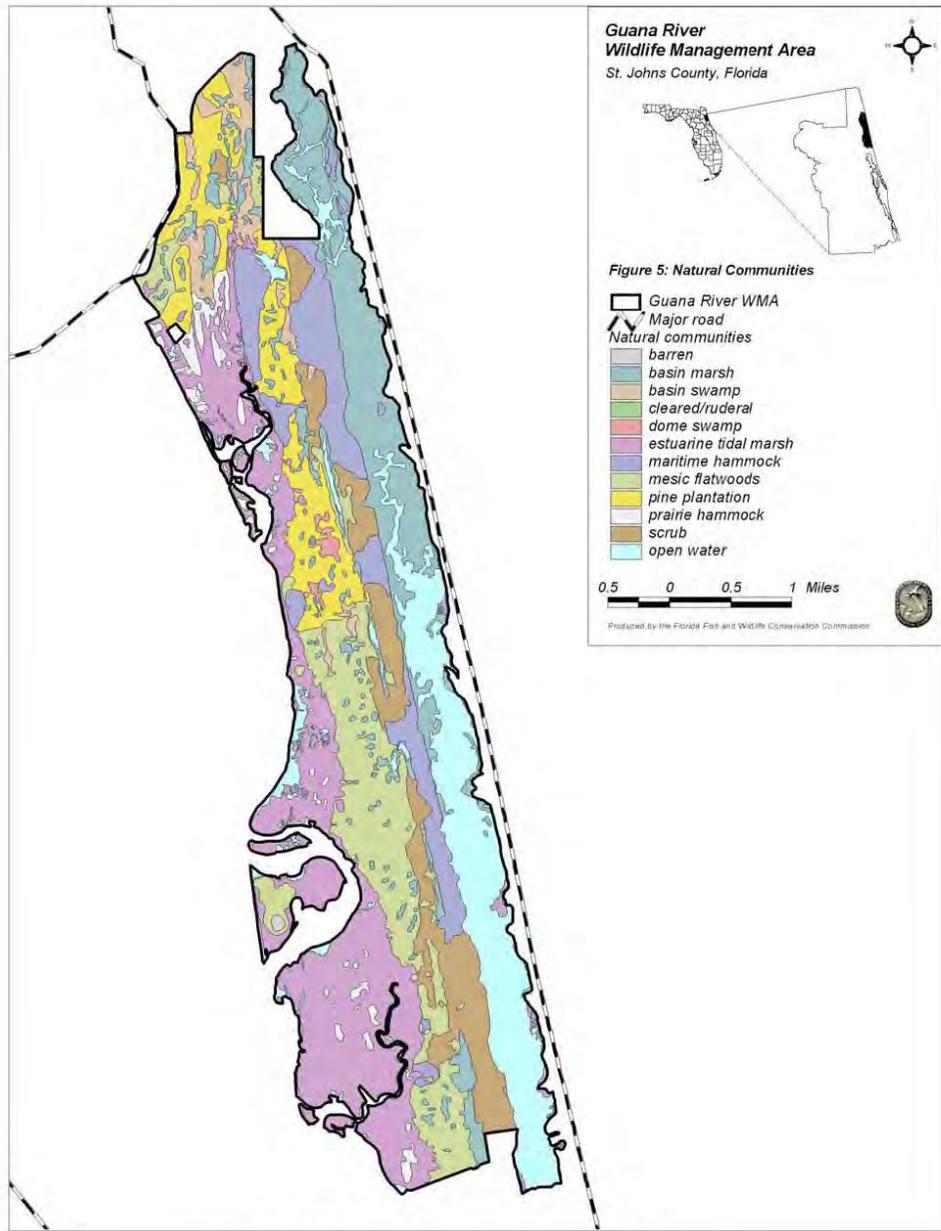


Figure 1. Natural communities on GRWMA

Wildlife Resources

Active wildlife management practices combined with a diversity of natural communities make Guana River WMA an excellent place to view wildlife, especially birds. During April and October, especially with a west wind or after a cold front, this is the best place in northeast Florida to see peregrine falcons. Nearly 3000-4000 migratory ducks, American coots, common moorhens, common gallinules, and pied-billed grebes winter at Lake Ponte Vedra. White pelicans (January and February), ospreys, and bald eagles often fish at the impounded lake. When water levels are low, black-necked stilts, yellowlegs, dowitchers, and other shore birds are commonly observed at the lake's north end. At Big Savannah and other ponds, especially in May through September, visitors are likely to see many types of wading birds including wood storks, roseate spoonbills, and white and glossy ibis. Alligators are also commonly observed in the areas impoundments and ponds. The Guana Dam and the tower on Hammock Road are excellent spots to photograph and observe birds.



Immature bald eagle

Scenic Resources

Scenic features include upland vegetation characteristic of mature maritime forest hammocks. Scenic views of pristine salt marsh and the Tolomato River, including its abundant tributaries, characterize the western boundary. Lake Ponte Vedra offers scenic views of open water, marshes and ecotones of upland maritime forest and coastal strand. Other wetland scenes include a view of inland freshwater impoundments and marshes, with several sites offering excellent wildlife viewing opportunities and scenic vistas. Some of these sites have been developed as scenic viewing areas with parking, boardwalks, viewing platforms, and interpretive signage.



View from Capo Creek tower

Cultural Resources

Between 6000 and 4000 years ago, people began to inhabit the land between the Tolomato River and the Atlantic Ocean. These early inhabitants hunted deer and other animals, fished and collected shellfish, and deposited shells in middens. A large (100 meters in diameter and a

meter in elevation) shell ring consisting of oyster, clam, conch, and coquina is believed by some archeologists to be the remains of a circular village. The elevated area was used as house sites and the center was used for ceremonies. When Europeans arrived in the sixteenth century, they found Timucuan, the descendants of these earlier people, living in villages surrounded by fields of corn, beans, peas, and pumpkins.

Over 35 land grants were recorded for the land now within the Guana River WMA. Beginning in the 1770s, British Governor James Grant operated an indigo plantation on the southern tip of the peninsula. In 1781, another plantation was established to grow rice. Cattle and hogs were also raised on the land and sugarcane grown. A network of dikes, levees, and ditches were constructed as well as a rice and sugar mill.

When Florida was returned to Spain at the end of the Revolutionary War, the Guana Tract was largely abandoned until Minorcan immigrants began purchasing small tracts for farming. In the early 1900s, canals were dug along the northern portion of the Tolomato River for the northern expansion of the Atlantic Intracoastal Waterway. In the 1920s, real estate investors and developers began to consolidate these tracts in the hope of developing a residential community. Their plans ended with the Depression. A small herd of Spanish ponies inhabited the area until they were destroyed during efforts to eradicate Texas tick fever. An intense pine harvest began in the late 1930s and continued through the 1970s. Between 1931 and 1980, impoundments were constructed for waterfowl hunting. Guana Lake was created between 1957 and 1962 to increase and to enhance habitat for waterfowl by damming the river and installing water control structures.

In 1984, the land was purchased by the state through its Conservation and Recreation Lands (CARL) program, and Guana River State Park and Guana River Wildlife Management Area were established.

According to the GRWMA Conceptual Management Plan there are 13 recorded archaeological and historic sites on the area, including an archaic shell ring, a burial mound, and shell middens. The majority of these sites are located within the maritime forest hammock habitat. The subsequent discovery of additional sites is anticipated during future investigations, primarily in hammock habitats.

The Guana River Shell Ring (Master Site File # 8SJ2554) is the only Archaic (ca. 2500-1000 B.C.) shell ring reported in the State of Florida, and may be eligible for listing in the National Register of Historic Places.

There are 2 cemeteries located on the area.

Resource Management

Prescribed Fire

A prescribed burning program has been implemented in pine plantations, pine flatwoods and selected marsh communities. Burn unit rotation provides an interspersed of burned and

unburned areas, thus increasing habitat diversity. Fire management will focus on maintenance of fire-dependent, sub-climax plant communities. Prescribed burning is used to reduce hazardous fuel accumulation and to increase species diversity and richness (fauna and flora). Prescribed burning enhances nutritive values of browse and herbs, and improves general habitat conditions for white-tailed deer, bobwhite quail, mourning doves, wild turkeys and many non-game species including raptors, songbirds, gopher tortoises and others. Burning also enhances aesthetic and scenic values by reducing dense vegetative growth.

Plant communities such as the maritime forest hammocks and estuarine salt marsh are not fire-dependent and are managed without fire. The scrub community is fire-dependent and is usually associated with intense crown fires. To improve wildlife habitat, overstocked pine stands are managed by thinning and periodic harvest. Understory vegetation is controlled by prescribed burning. Mechanical vegetation control (i.e., chopping or disking) is utilized where stand conditions or objectives preclude the use of fire.

In addition to prescribed fire, the scrub communities on the GRWMA are managed with mechanical treatments to rejuvenate and maintain early successional conditions. The goal is to maintain a diversity of seral stages to enhance habitat conditions for scrub endemic species.

Approximately 1,500 acres are burned yearly. The majority of burning is conducted between November and June.

Water Control on Area Impoundments

Water level manipulations in Lake Ponte Vedra and interior impoundments increase food resource availability to fish, and many migratory and resident wildlife species. Of the 6,341 acres of natural and man-modified wetlands on GRWMA, 2,573 acres (41%) are managed impoundments. Lake Ponte Vedra accounts for 2,366 acres while interior impoundments total 207 acres. Interior impoundments include Big Savannah, Little Savannah, Booth's Pond, Cook's Pond, McNeil's Pond, and Diego Pond (Figure 2). All the impoundments are freshwater except for Diego Pond which is brackish.

Water management schedules follow the seasonal chronology of migratory wildlife and natural vegetation dynamics. Impoundments are flooded in fall for the benefit of waterfowl. Gradual water level reductions continue in January or February to increase resource availability to wading birds and shorebirds. Drawdowns and burning activities are conducted during late winter and early spring (January through April) at which time reflooding with saline water is conducted as prescribed.

Native plants are maintained on man-modified wetlands to produce high-quality wintering waterfowl habitat.

III. Interpretation

Interpretive Themes

Interpretive themes are categorized as primary and secondary. Primary themes are critical concepts that we want visitors to remember after they have left GRWMA. Primary themes help set visitor experience goals and priorities and are considered in the design of amenities offered to nature-based recreationists. Secondary themes are important but are not as significant as primary themes.

Primary Interpretive Themes

The coastal physiography of the area, with the proximity of salt and fresh water habitats and diverse mix of upland and wetland communities, results in a great diversity and density of wildlife.

FWC biologists actively manage plant communities on Guana River WMA to benefit wildlife utilizing techniques such as prescribed fire, mechanical management and water level manipulation in impoundments.

Secondary Interpretive Themes

Coastal areas like GRWMA provide critical habitat to migrating bird species such as black-throated blue warblers, oven birds, and orchard orioles during the fall and spring migration

Humans have made a living from the area dating back 6,000 years to the present. [Human timeline – hunting gathering societies (middens), Native American agriculture (Timucuan); Colonial agriculture (rice); U.S. territory (Minorcan farming); 20th century (logging, impoundments created for hunting)]

Visitor Experience Goals

At GRWMA, the FWC will provide opportunities for visitors to:

1. Become oriented to and participate in a range of recreational activities on GRWMA and adjoining natural areas while:
 - becoming acquainted with wildlife and natural plant communities on the GRWMA and
 - understanding GRWMA’s natural, cultural and commercial history, in context with the history and prehistory of Florida.
2. Learn information and stories associated with major interpretive themes, and other related information, through interpretive materials accompanying welcome kiosks, and hiking and biking trails, and wildlife viewing facilities.

3. Have an enjoyable recreational experience without impairing the natural and cultural values of the site. In terms of wildlife viewing, FWC's goal will be to facilitate positive, memorable experiences that keep wildlife disturbances to a minimum.
4. Understand the management role and goals of the FWC on GRWMA.

IV. Recreation Assessment

Existing Recreational Use and Facilities

A map which locates existing site features and facilities is provided in Figure 2. All photographs referenced in this report are located in Appendix 5: Inventory Photographs. A recreation stakeholder meeting was conducted in Ponte Vedra, Florida on August 25th, 2005 to solicit comments from a variety of user group representatives regarding recreation needs, issues, and concerns. Their comments are summarized in Appendix 6.

Entrances:

Designated entrances into Guana River WMA are located at the south and north ends of the area and at the boat ramp located on the east boundary along A1A.

South Entrances

The primary entrance is located on the south side of the property approximately one mile west of U.S Highway A1A. The entrance road crosses the Lake Ponte Vedra Dam and is shared with the GTM Reserve – Guana River Property. Visitors to GRWMA must first pass through the newly renovated, gated GTM Reserve trailhead.

The GTM Reserve trailhead does not contain information about the Guana River WMA. The map in the kiosk shows the management area entrance but the focus is primarily on the GTM Reserve property. Visitors to the area would be well served if recreational opportunities for both the GTM Reserve and GRWMA were presented at this location. If this option is not feasible, the water control structure south facing wall is a possible location for posting orientation information.

From the GTM Reserve trailhead parking lot visitors can hike or bike approximately ¼ mile to the north on the entrance road to the Guana River WMA gate (Photo 1). At that point there is a primary entrance sign (Photo 2), a small kiosk with hunt maps and regulatory information (Photo 3), and a visitor sign in box. The hunter check station and equipment storage facility is located approximately ¼ mile north of the primary entrance (Appendix Photo 4). There is one large information kiosk (two 42"x 42" panels) and one small kiosk at this site (Appendix Photos 5 and 6). Both kiosks are in relatively good condition but are not consistent with kiosk styles in the ORS design handbook. Most of the information posted on these kiosks is hunting related.

Other entrances include two pedestrian gates in the fence separating GRWMA and the NERR property (Photo 7). None of the entrances from the NERR property have information to orient and inform visitors.

North Entrances

The Roscoe Blvd. Entrance on the north side is a secondary entrance (Photo 8). Facilities include a large parking area to accommodate horse trailers (Photo 9), one information kiosk with two 42" x 42" panels on the front side (Photo 10), and a visitor sign in box. The information displayed on the kiosk includes a hunt map, regulations, and interpretive posters.

An approach sign at the intersection of Roscoe Blvd. and County Road 210 is needed to direct visitors to the Roscoe Blvd. entrance. It is recommended that FWC coordinate with the St. John's County Road Department or Florida Department of Transportation to get such a sign installed.

A service road entrance is located on County Road 210 (Photo 11).

Six-mile Landing

Six-mile Landing, located on A1A (Photo 12), is also a designated GRWMA entrance and check station. Facilities include signage for fishing and waterfowl hunting regulations and a concrete boat ramp.

Vehicles

Vehicles are allowed on the area during hunts and scouting. They may be operated only on named or numbered roads.

Hunting

GRWMA is well known for waterfowl hunting. The hog, squirrel, and deer populations are also healthy. Hunting is limited to 12 weekends per year from October through January. A maximum of 100 quota hunt permits are issued for each of the major hunts (archery, muzzleloading, and general gun). A maximum of 75 permits are offered to hunters on a daily basis for the small game hunt days. A maximum of 100 permits are offered on Wednesdays and Saturdays for the migratory waterfowl hunts on Lake Ponte Vedra.

Hunting is allowed on GRWMA one half hour before sunrise until one half hour after sunset. The exception to this rule is for waterfowl hunting which is allowed one half hour before sunrise to noon.

Except for horseback riding, the area is open to hiking, biking, and paddling during hunting. GRWMA's few hunting days and relatively low numbers of hunters makes offering other types of recreation feasible, however due to the narrow configuration of the uplands on the area,

conflicts between hunters and non-hunters occasionally occur. These are mostly limited to roads and trails. A few conflicts between recreational paddlers and waterfowl hunters on Lake Ponte Vedra have been reported. Clearly communicating hunting days and hours at all entrances to the property is essential to minimize potential hunter/non-hunter conflicts.

Fishing

Fishing is excellent at times for redfish, seatrout, croaker, and black drum. Visitors fish at the dam and along the banks of the Lake Ponte Vedra and the interior ponds and impoundments. Lake Ponte Vedra is also a popular spot for crabbing. Boat ramps are located at the Lake Ponte Vedra Dam at the south end of the property and off A1A at Six Mile Landing. Boat engines larger than 10 horsepower are prohibited on the lake. Boats may not be operated within 50 yards of the water control structure.

At those times when concentrations of game fish move through the water control structure spillway, the dam can be very crowded with anglers. Recently completed improvements to the dam use area by the GTM Reserve, include paved parking, paved boat ramps, and an ADA accessible ramp to the shore of the lake. The spatial separation provided by the improvements should help prevent potential conflicts between fishermen, crabbers, paddlers, and boaters.

Area staff receive many questions from visitors to the dam about the management of water levels in the lake and the kinds of fish that can be caught there. Presently, there is very little information posted to address these kinds of questions. The large blank concrete wall of the water control structure would be a good location for interpreting these topics. Similar interpretive panels should also be developed and installed at all boat ramps.

Wildlife Viewing and Nature Study

Guana River WMA is one of the premier spots on the Great Florida Birding Trail. This undeveloped coastal habitat is critical for migratory songbirds in fall and spring migrations. During April and October, especially with a west wind or after a cold front, this is the best place in northeast Florida to see peregrine falcons. Three to four thousand migratory ducks, American coots, common moorhens, common gallinules, and pied-billed grebes winter at Lake Ponte Vedra. White pelicans (January and February), ospreys, and bald eagles often fish at the impounded lake.

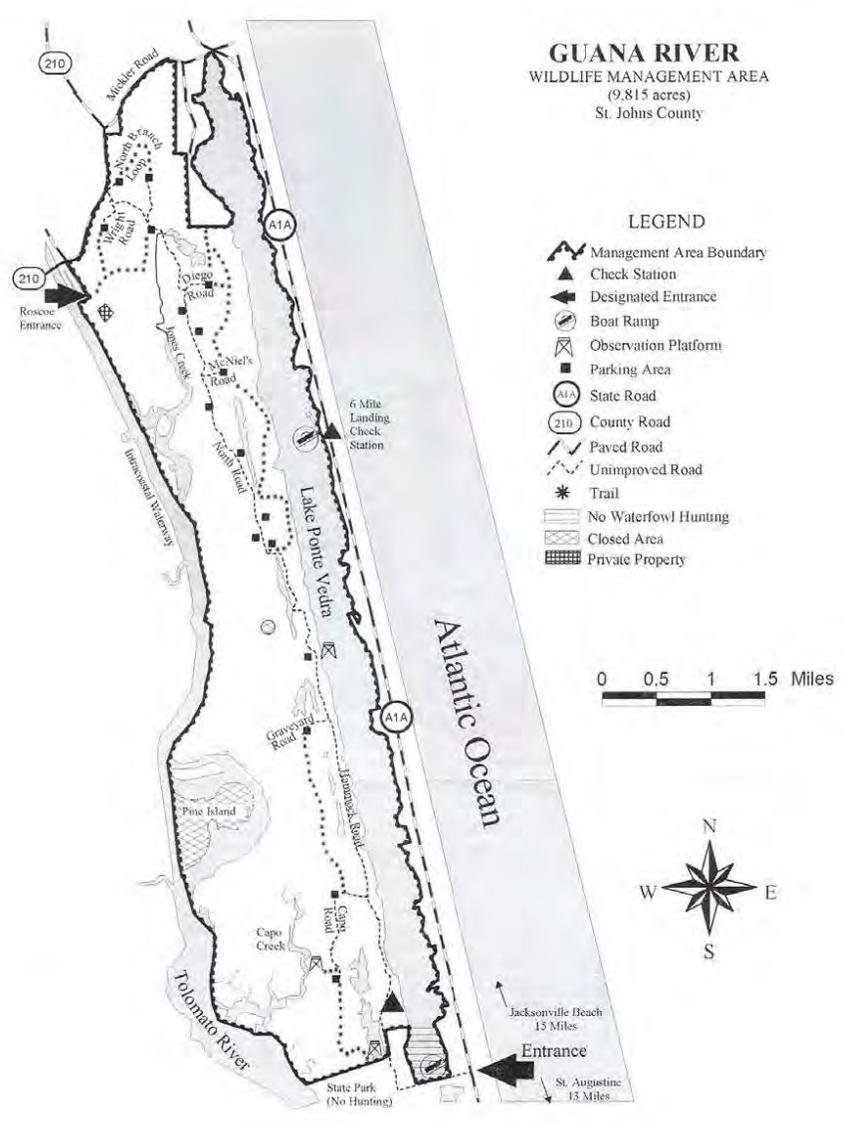


Figure 2. Existing Features and Facilities on GRWMA

When water levels are low, black-necked stilts, yellowlegs, dowitchers, and other shore birds can be observed at the lake's north end. At Big Savannah and other ponds, especially in May through September, wood storks and white and glossy ibis are commonly seen.

Viewing/Interpretive Sites

The Guana Dam (Photo 13) and the Lake Ponte Vedra observation tower (Photo 14) are excellent spots to photograph and observe birds. Other viewing facilities include a second observation tower on Capo Creek (overlooking salt marshes and the Tolomato River) (Photo 15) and an observation platform on the southwest corner of the Big Savannah impoundment (Photo 16). These facilities need better directions and way finding signs so visitors can more easily find them.

Interpretive facilities on GRWMD include one 2'x3' panel at each of the observation towers (Photo 17 and 18). One set of scrub interpretive panels on Hammock Road just north of the check station (Photo 19) and another set just north of the Lake Ponte Vedra observation tower. Located at the Big Savannah viewing platform is a large interpretive structure with many panels that describe some of the area's habitats and wildlife (Photo 20, 21, and 22). The small information kiosk at Booth's Pond contains a freshwater fish identification poster (Photo 23).

Most of the interpretive structures are generally in good shape although some minor repairs may be necessary. Interpretive panels will be revised and relocated if necessary to fit into the interpretive themes and visitor experience goals presented in Section III of this report. As kiosks reach the end of their useful lives, they should be replaced with standard FWC structures.

Hiking

Visitor sign in sheets indicated that 463 hikers used the area during FY 03/04.

Miles of well-maintained woods roads, improved roads, and firelines on the area provide hikers with a wide variety of hiking opportunities. There are currently more than 8 miles of roads which are designated as hiking trails. Some of these lead to viewing facilities with magnificent marsh views (Figure 2). The trails are delineated on the area hunt map but are not marked on the ground for use by hikers, cyclists, and equestrians. Presently, the trails are not linked in a systematic way.

A system of nested loop trails would provide diverse hiking opportunities through multiple habitats to accommodate a variety of wildlife viewing, nature study, and interpretive experiences. Providing a series of loops of different lengths accommodate hikers with different interests and abilities. A loop system could easily be created using existing roads and trails. Opportunities for developing a loop system exist on both the north and south ends of the property. Such a system would need to be illustrated on a map for distribution at both entrances and well marked on the ground. The loop system

of trails should be designed as multi-use to accommodate bikers and horseback riders as well.

Biking

Biking is permitted on most named and numbered roads, established trails, and fire lines. Off road bicycles are most appropriate on the unpaved roads and trails (Photo 24). Bikers would benefit from the creation of a well-marked loop system as described in the hiking section above.

One hundred and ninety three (193) bikers signed in during FY 03/04.

Horseback Riding

Horseback riding is permitted on most named and numbered roads, established trails and firelanes. Horses are prohibited during archery, muzzleloading gun, general gun, and small game hunting seasons. Presently, equestrian users can enter the property at both entrances. The Roscoe Blvd. entrance has a large parking area to accommodate horse trailers. Horses are not allowed at the dam on weekends or holidays. The Florida Department of Environmental Protection may change their rules in the future to prohibit the parking of horse trailers on the dam at anytime.

One popular destination for riders is the Lake Ponte Vedra observation tower where area staff recently installed a hitching rail and mounting/dismounting station (Photo 25 and 26).

Approximately 300 - 400 riders are reported to use the area each year. Equestrian users would benefit from a well-marked loop system as described in the hiking section above.

Paddling

Kayaking on Lake Ponte Vedra is very popular. The numbers of kayakers has increased dramatically in the last few years. Boat landings exist at the dam (Photo 27) and at Six Mile Landing on Hwy A1A. Recently, concessionaires have begun to provide boat rentals and tours between the two landings.



One popular destination for paddlers is the Lake Ponte Vedra observation tower though access to the tower from the water is quite difficult due to the soft bottom and marshy conditions (at left). The installation of a canoe/kayak dock at this destination would be a significant enhancement for area paddlers and it

would help prevent the destruction of shoreline vegetation.

One hundred and four (104) paddlers signed visitor sign in sheet in FY 03/04. Paddlers would benefit from maps posted at boat launches that depict paddling distances and points of interest.

Picnicking:

Currently, there is only one site on the property with picnic facilities. Located on the north side of the property, the Jones Creek site has one picnic table with a beautiful view of the adjacent salt marsh (at right). To enhance the quality of the visitor experience, picnic tables should be installed at all destination sites on the area including the viewing platform on Big Savannah, the Capo Creek and Lake Ponte Vedra observation towers, the Booth's Pond boat launch on Hammock Road, and the north and south entrances. One table at each site should be adequate.



Camping:

Camping is not permitted on GRWMA. Some illegal camping does occur along the Tolomato River.

Appropriate Recreational Uses on GRWMA

Based on the interpretive themes developed for the area, the analysis of existing resources and uses, and the approved uses and activities as stated in the 2002-2007 Conceptual Management Plan, the following activities should be continued and enhanced on AWMA:

- Hunting
- Fishing
- Wildlife viewing
- Nature study
- Photography
- Hiking
- Horseback riding
- Biking
- Paddling
- Picnicking

Recreation Management Zones

Recreation studies demonstrate that visitors come to recreate on public lands with many different expectations (NPS, 1997). Providing a variety of settings allows visitors to select the type of experience they desire, simplifies management and reduces conflicts between visitors who are seeking different types of experiences. The zones delineated by the planning team are provided on Figure 3 and 4: Conceptual Site Plan. Each zone is described in terms of the type of experience it offers, the natural resources related to the experience and the level of management required.

Semi-primitive Zone

The semi-primitive zone provides a sense of being immersed in a natural landscape with opportunities for solitude. Observation structures, boardwalks, interpretative signs, and unpaved trails are the types of recreational facilities that are appropriate in this zone. A moderate level of management is provided for resource protection and safety.

Within the semi-primitive zone on GRWMA, visitors will experience the major community types including maritime forest, scrub, flatwoods, basin marsh, and salt marsh. Here they can learn about the complex relationship of upland and wetland communities in providing critical habitat to many species of wildlife.

The majority of GRWMA is categorized as semi-primitive.

Developed Zone

The developed zone is an area with visitor facilities such as parking, picnicking and toilets. The visitor's experience in this zone is highly social. Trails may be paved or hardened for access by people with disabilities. Visitors and facilities are intensively managed in this zone for resource protection and safety purposes. The most intensive interpretation is provided in the developed zone. This is the most appropriate zone for building construction.

There are two developed zones on GRWMA, one on the south side with the primary entrance, the check station, and the interpretive center on Savannah Pond and the other being the Roscoe Blvd. entrance area on the north side.

Sensitive Resource Protection Zone

Sensitive resource protection zones encompass areas with fragile habitats, rare and endangered species, archaeological/historical sites, and steep slopes. This zone can support little visitor impact. Only limited and strictly controlled access should be allowed for interpretation purposes.

The sensitive zones on GRWMA are areas around wetland communities, bird rookeries, bald eagle nesting sites, and the shell ring site on Hammock Road.

V. Recreation Prescriptions

Proposed Visitor Experiences and Recreation Facilities

The following narrative describes the overall experience that is intended for visitors to GRWMA. A conceptual site plan for proposed recreation facilities is provided in Figure 3.

When visitors arrive at either entrance they can stop at an information kiosk to review a large map and learn about all of the recreational opportunities available on the area, including hiking, biking, horseback riding, paddling, and wildlife viewing opportunities. Area bird lists and recreational guides will also be located on this kiosk.

From the primary entrance on the south side, visitors can travel a short distance to the Big Savannah viewing platform and interpretive display. Here, depending on the season, they can observe a variety of waterfowl and wading birds feeding in the shallow waters of the impoundment. At the interpretive display, they can learn about the area's coastal physiography and the unique blend of plant communities and the wildlife that depend on them. Another feature of interpretation is the area impoundments and how they are managed for the benefit of wildlife.

From Big Savannah, visitors can travel north for approximately 1 ¼ miles through a stretch of flatwoods to the observation tower on Capo Creek. Here they can experience expansive views of salt marshes and tidal creeks. Interpretive panels on the tower will provide information about these dynamic habitats and the fish and wildlife that live here. Visitors can get an up close experience of a tidal creek as they rest on the boardwalk benches. Here, they can see armies of fiddler crabs marching through spartina grass at low tide or catch a glimpse of a wily red fish as it streaks through at high tide in search of a meal.

From the Capo Creek tower, visitors can choose to return, via a short loop between Big Savannah and Little Savannah, to the entrance or they can hike further north through an interesting strip of Florida's ancient scrub. Hikers may decide to rest awhile at a shady picnic site on Booth's Pond. Here they might throw in a fishing line to catch some bream or large-mouth bass. From the Lake Ponte Vedra observation tower, less than ¼ mile north of Booth's Pond, visitors can experience good birding and rewarding views of the lake and a long, unbroken stretch of the natural coastal dunes system. A canoe/kayak dock at the tower provides easy access for Lake Ponte Vedra paddlers who can enter the lake from the Six Mile Landing or from a boat ramp at the dam.

From the tower, visitors can head back to the entrance on the shady Hammock Road much of which runs through a beautiful canopy of maritime forest.

A similar experience can be achieved from the north entrance on Roscoe Blvd.. Visitors can travel on series of loop trails of increasing length through maritime forest and scrub with occasional spurs to the shore of Lake Ponte Vedra.



Figure 3. GRWMA Conceptual Site Plan – North End.

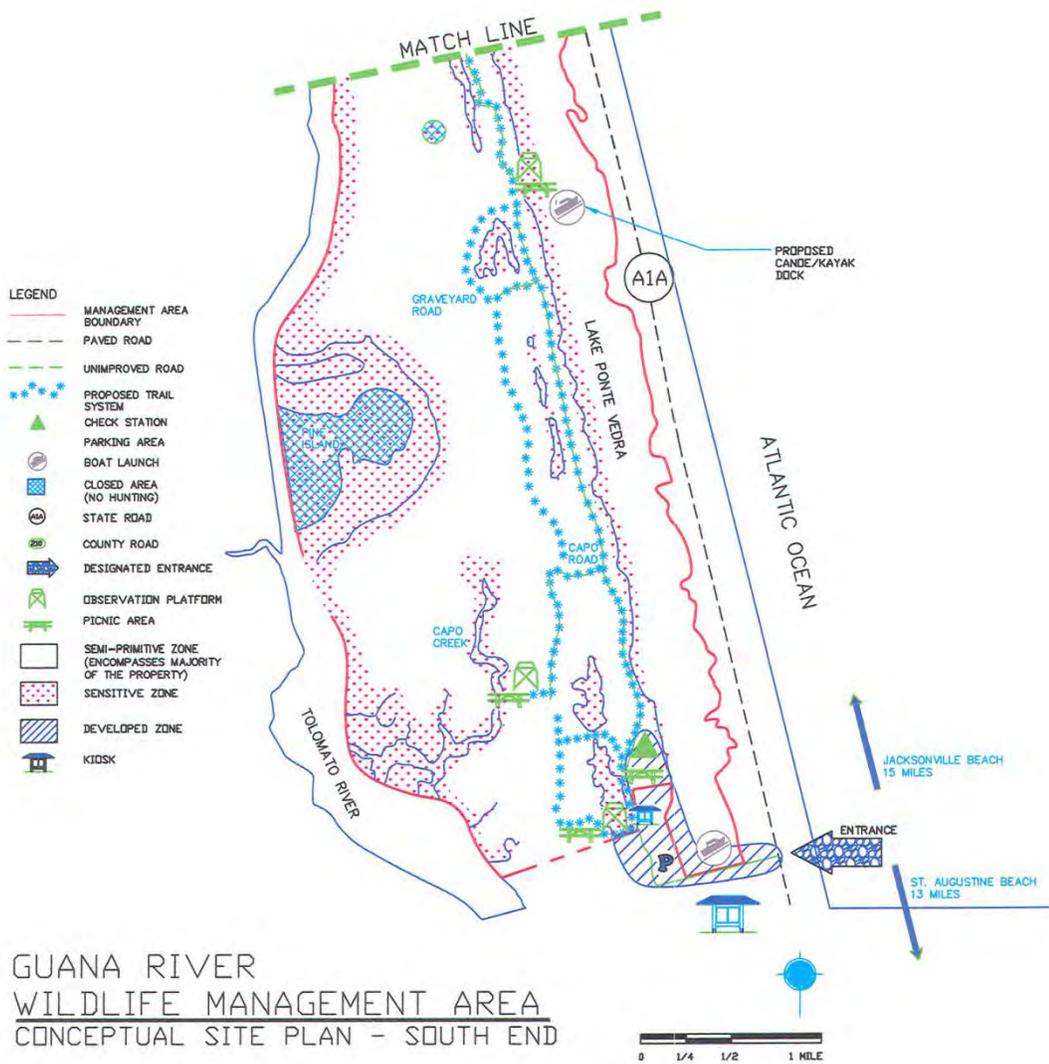


Figure 4. GRWMA Conceptual Site Plan – South End

Recommended Nature-Based Recreation Goals and Objectives

Careful design and placement of recreational facilities can provide suitable visitor experiences and minimize impacts to the natural and cultural history of the area. All planning and implementation should be done in accordance with guidelines in Appendix 1. A conceptual site plan for proposed recreation facilities is provided in Figure 3.

Goal A. Orient visitors to the area and its recreation opportunities and provide interpretive information

1. Develop and install new wayfinding signs at appropriate locations (as described in the Sign Plan, Appendix 3).
2. Install interpretive panels on the water control structure at the dam to orient visitors to the area, provide information about recreational opportunities (especially fishing, paddling and birding related activities) and explain FWC's management of the impoundment.
3. Improve the existing entrance kiosk at the Roscoe Blvd. entrance by installing interpretive panels and maps to establish the significance of the area, invite users in and orient them to the available recreational opportunities.
4. Explore the possibility for sharing the new NERR trailhead and providing GRWMA maps and interpretive information at their kiosk. If this is not possible, install a new information kiosks at south entrance with an area map and interpretive information.
5. Replace existing interpretive panels at viewing facilities with new panels that support interpretive themes.
6. Develop area recreation guide with a high quality map and information about available recreation opportunities.
7. Stock area recreation guide and bird list in brochure racks at entrance kiosks.
8. Maintain up-to-date information about the area on the FWC website.

Goal B: Design and Implement a Comprehensive Trail System for Hikers, Cyclists and Equestrians

1. Redesign the trail system to enhance wildlife viewing opportunities and the overall interpretive program. Reroute existing trails to establish multi-use nested loops that reinforce interpretive concepts and provide trail opportunities from the north and south entrances.

2. Create spur trails from the main loop trails as necessary to features of interest.
3. Focus loops in the northern portion of the property on the maritime forest, scrub and basin marsh communities.
4. Focus loops in the southern portion of the property on the impoundments, flatwoods, scrub and maritime forests and the existing interpretive and viewing facilities.
5. Install kiosks with maps at south pedestrian entrance and if using the GTM Reserve trailhead facility is not feasible, build an entrance kiosk at the southern primary entrance.
6. Install trailside benches on loop trails (where appropriate) to enhance the hiking experience.

Goal C. Renovate and provide new facilities to enhance recreation opportunities

1. Make repairs and improvements to the observation towers as specified in the March 2004 engineering report. Repair railings at Big Savannah observation structure.
2. Construct a canoe/kayak dock at the Lake Ponte Vedra observation tower to accommodate area paddlers.
3. Install picnic tables at the north and south entrances, Big Savannah, Capo Creek tower, Lake Ponte Vedra tower, and Booth's Pond.
4. Install two benches on the boardwalk to the Capo Road observation tower.
5. Determine the feasibility of installing bike racks and hitching posts at destination points along the trails as appropriate.
6. Determine the feasibility of adding gates to secure the equestrian parking area at the Roscoe Blvd. entrance.
7. Construct a wildlife viewing blind on Diego Pond.

Goal D: Direct and manage recreational use to minimize negative resource impacts and maximize visitor satisfaction

1. Route trails away from sensitive zones and utilize trail structures to prevent soil damage in seasonally wet areas.
2. Use strategically placed signs, trail markers and high quality maps to assist visitors in navigating the area.

3. Implement a monitoring strategy to assess resource impacts and institute corrective management actions if indicators begin to approach standards.
4. Collect and evaluate information about visitor use and satisfaction:
 - Number of visitors to the area and patterns of visitation
 - User group conflicts
 - Origin and length of stay
 - Motivations for visiting and preferred experiences
 - What they already know about the area, and primary interpretive themes

Goal E. Coordinate recreation activities with local, regional, state and federal agencies and organizations

1. Communicate regularly with the local Tourist Development Council to ensure responsible and accurate promotion of nature-based recreation opportunities.
2. Communicate with the Guana-Tolomato-Matanzas Reserve to coordinate recreational opportunities and information for the benefit of area visitors.
3. Develop and maintain relationships with recreational user groups and encourage them to be involved in designing, developing, monitoring and maintaining recreation amenities and offering recreation or interpretive programs on the area.

B. Challenges and Strategies

There are several challenges facing the effective implementation and management of nature-based recreation opportunities on the GRWMA. Challenges and proposed strategies to address them are discussed in this section.

Challenges:

- Separating recreational uses is difficult given the narrow layout of the area.
- As recreational uses expand in scope and increase in volume, resource impacts may occur. Sensitive plant communities, wildlife habitats, and archaeological sites could be adversely affected from soil disturbances resulting from inappropriate hiking and biking activities.
- As recreational uses expand in scope and increase in volume conflicts among user groups may occur.
- The DEP has expressed a desire to close the south entrance to hunters. If this does occur the north entrance may need to be moved or expanded and redesigned to

accommodate more vehicle traffic. Neighbors at the north entrance may object to additional vehicle traffic.

- St. Johns County is seeking to widen Mickler Road along the northern boundary of the area. This widening will require developing several retention ponds along the border and will affect the interior road/trail system.

Strategies:

- Recreational use will be directed away from sensitive environments to the greatest degree possible. Environmental protection information will be provided in all interpretive materials. Recreational use will be monitored for environmental impacts and corrective actions will be implemented when and where necessary.
- A range of recreational opportunities will be provided in a variety of settings to allow users to disperse and avoid conflicts as much as possible.
- All entrances will have information posted to advise hikers, bikers, and horseback riders of hunting activity. Recreation guides will advise recreators who want to visit the area during hunts to stay on main roads and to use the area during the middle of the day to avoid disturbing hunters.
- All promotional materials will seek to differentiate the Guana River WMA from the GTM Reserve property and will accurately describe the mission of Guana River WMA and the type of experiences offered.
- The Roscoe Blvd. entrance and northern trail loops will be redesigned as necessary to accommodate increased vehicle traffic if hunter entrance is moved to the north.
- Work with St. Johns County and developer to maximize recreational amenities if road widening project must be accommodated.

C. Work Plans

As annual work plans and budgets are developed for GRWMA, Recreation Services staff will provide cost estimates for developing nature-based recreation related construction and estimates of hours required for tasks such as trail maintenance. Recreation Services staff will be responsible for producing interpretive materials for the areas and for coordinating the design and construction of any recreational structures built on the area in cooperation with area staff.

D. Monitoring and Management of Recreation Facilities

Measurable indicators for monitoring key aspects of the visitor's experience and resources at GRWMA are described in Appendix 2. Standards represent the point at which visitor experience and resource conditions become unacceptable. Indicators should be monitored for

each zone, and when necessary, management actions taken to ensure that visitor use and resource impacts remain within the established standards.

References

Florida Fish and Wildlife Conservation Commission. 2001. A Conceptual Management Plan for Guana River Wildlife Management Area (2002-2007).

National Park Service. 1997. The Visitor Experience and Resource Protection (VERP) Framework: A Handbook for Planners and Managers.

Appendix 1

Recreation and Wildlife Viewing Facilities Design Guidelines

- **Entrances**
Should welcome visitors to the area, identify the Commission, describe the range of potential experiences on the area, describe the wildlife viewing experiences by season, time of day or wildlife event.
- **Viewing structures**
Structures should include wildlife identification or other interpretive information. The structure should be surrounded by and focused on wildlife and habitat, rather than being the focus itself. For towers, each level should focus visitor attention to a different habitat or feature.
- **Trails**
Trails should be described at the trailhead with length or time required. If the focus is wildlife viewing include best seasons. Interpretive panels or brochure stops should be well-spaced and focused by season and should not exceed $\frac{1}{2}$ to $\frac{3}{4}$ of a mile.

General considerations in developing facilities:

- Locate viewing facilities on previously disturbed properties wherever possible.
- Preserve a sense of solitude and limit impact on natural resources by concentrating recreation uses in small “developed” zones and along existing road/trail corridors.
- Site facilities and design trails to minimize user conflicts.
- Avoid sensitive areas such as wetlands and route trails to avoid fragmenting habitat.
- Consider physical characteristics and the historical and natural character of the location.
- Adapt parking lots, buildings, and other physical developments to existing topography.
- Retain on-site surface water run-off generated by development.
- Use porous pavements where surface hardening is required.
- Consider sewage disposal needs.
- Use native plants representative of the area for all landscaping.
- Design and build trails and observation structures to avoid disturbing wildlife and to minimize negative impacts such as erosion.
- Use elevated boardwalks in wet areas and swamps and walkovers to protect other sensitive areas.
- Incorporate wildlife viewing ethics into all interpretive materials.
- Incorporate interpretive themes into all brochures, trail guides and other materials produced to support recreation opportunities.
- Install interpretive signs and panels as appropriate at all recreation facilities.
- Route trails to interpret restoration and wildlife management activities.
- Insure interpretation of highly desired species viewable on the area.

Universal Access

Nature-based recreation facilities and programs must be developed and implemented in compliance with the Americans with Disabilities Act. All facilities in developed zones should be universally accessible. Recreation facilities in semi-primitive or primitive zones should be planned to be accessible to the degree possible except where:

- compliance will cause harm to cultural, historic or religious sites or significant natural features or characteristics
- compliance will substantially alter the nature of the setting or purpose of the facility or portion of the facility
- compliance would require construction methods or materials prohibited by federal, state or local regulations or statutes, or compliance would not be feasible due to terrain or prevailing construction practices.

Appendix 2

Management and Monitoring

Provisional Resource Indicators and Standards

These indicators and standards are provisional and should be tested to ensure they are feasible to monitor and provide useful data. They should be revised as necessary after field-testing and then maintained. Indicators measure both resource and social conditions and should be measured annually. If indicators show that conditions are approaching or exceeding a standard, monitoring frequency may need to be increased to determine if corrective management actions are having the desired effect.

Social Indicators and Standards:

ZONE	INDICATORS	STANDARDS
Upland Mixed Use Trail	Conflicts between different groups	No conflicts
	Number of groups encountered per day	1 group of 2 to 4
Developed (wildlife viewing facilities, picnic areas)	People at one time (PAOT) per zone	3 – 4 groups of 3 each
	Parking congestion	Parking area at 75% capacity
Sensitive Resource Protection Zone	PAOT	0

Resource Indicators and Standards:

- Trail Widening
- Density of Social (unofficial) Trails
- Road Widening
- Ground Cover (percent cover)
- Frequency of Litter

Trail Width – Some variance in tread width is acceptable and even preferred. But, if sections of the trail seem to be widening due to use (such as hikers cutting corners, avoiding unfavorable tread, etc) document existing and potential problem areas and specify exact location so immediate corrective action can be taken.

Trail type	Tread Width (m)	Cleared Width (m)	Grade	Height (m)
Hiking Trails	0.6	1.2	Max. 10%	2.1
Biking	Desirable 2.4 Min. 1.5	Same	Max. 8%	2.1

Source: National Recreation and Park Association

- 1 = width is at standard
- 2 = width exceeds standard in a few spots
- 3 = trail widening and social trail observed in numerous areas

Erosion – Observers should visually estimate erosion based on the following criteria:

- 1 = Very Little
- 2 = Some: Tree roots or standing water evident
- 3 = Moderate: Exposed trees or rocks but little evidence of widening, some exposed soil
- 4 = Extensive: Tree roots exposed and damaged. Many exposed patches of soil. On trails, ruts formed and evidence of widening
- 5 = Very Extensive: Eroded to substrate or tree roots severely damaged. On trails, ruts

significant and significant evidence of widening. Extensive stretches of exposed soil.

Litter – Observers should estimate the amount of litter collected along trails or in developed areas based on the following criteria:

- 1 = None
- 2 = Very Little, <5 pieces.
- 3 = Some, 5 – 10 pieces
- 4 = Extensive, 10 – 15 pieces
- 5 = Very Extensive, 15 + pieces

Sanitation – To determine the need for toilet facilities, note the amount of litter associated with human waste.

Monitoring

Resource and visitor data should be regularly collected in a consistent manner to determine if standards are being exceeded. This task should be incorporated into the work plan for the area. Monitoring data can demonstrate if visitor use is exceeding capacity and will support decisions to limit recreational access if necessary.

An initial survey should be conducted to serve as a baseline and monitoring should be conducted annually. Traffic counters can be installed as desired to generate data on vehicles entering the area. Photos stations should be set and photos taken each time the area is monitored.

Trail Maintenance

Conditions should be inspected approximately once every 3 months. Ideally, volunteers can assist in checking trails and document litter, erosion, and trail widening, vandalism, trail obstructions, wet conditions and informal trails. A logbook may be placed near the trail for users to document any experiences on the trail, including species seen, obstructions or hazards, signage problems and general comments.

Example Monitoring Form

Observer: _____

Date: _____

Site: _____

Litter Rank (circle one):

1 = None

3 = Some, 5 – 10 pieces

5 = Very Extensive, 15 + pieces

2 = Very Little, < 5 pieces.

4 = Extensive, 10 – 15 pieces

Comments:

Were there any erosion problems? Please note the exact location and rank according to following criteria:

1 = Very Little

2 = Some: Tree roots or standing water evident

3 = Moderate: Exposed roots/rocks but little evidence of widening, some patches of exposed soil.

4 = Extensive: Many tree roots exposed, many spots of exposed soil, ruts and/or trail widening.

Comments:

The hiking trail should be between about 3 and 4 feet wide. Please rank overall trail width.

1 = 3 ft. (OK)

3 = 5 ft. (exceeding standards)

2 = 4 ft. (just about “normal”)

4 = 6 ft. (unacceptable)

If there were problem areas, please describe condition and exact location:

How many other groups of hikers did you encounter along the trail? How many vehicles were in the parking lot?

____ groups ____ approx. # in the group ____ vehicle in parking area

Appendix 3

Guana River WMA Sign Plan

Draft

This sign plan contains locations for both wayfinding (directional) signs and interpretive panels. Wayfinding signs where they exist on the area are wooden, routed signs. It is suggested that these be replaced with aluminum or recycled plastic signs for a consistent look throughout the WMA system.

U.S A1A/Entrance Road – N/A

Water Control Structure – interpretive panel(s)

Southern entrance – medium kiosk (8'wide) with orientation and interpretive panels

Big Savannah interpretive facility – (3) 48"x 18" interpretive panels over existing angle boxes in shelter

Capo Creek Tower – (3) 30" x 9" interpretive panels – one on each tier of tower

Booth's Pond – (1) interpretive panel in existing kiosk

Lake Ponte Vedra Tower – (3) 30" x 9" interpretive panels – one on each tier of tower

Roscoe Blvd./CR 210 intersection – (1) DOT highway wayfinding sign

Roscoe Blvd. entrance – (2) 42" x 42" interpretive/orientation panels in existing kiosk

Install aluminum road signs – Hammock Road, Capo Road, Graveyard Road, North Road, McNeil's Road, Diego Road, Wright Road

Appendix 4

Work Plan for Nature-Based Recreation Enhancements

Based on the prioritization of the goals and objectives listed above, the following list of projects and tasks has been ordered in terms of short and long term completion timeframes.

1. Tasks 2005-06

- Install new wayfinding signs on area road system.
- Redesign the trail system and establish trailheads.
- Construct kiosks and install interpretive and informational signs.
- Develop area brochure with high quality map and information about available recreation opportunities.
- Install additional picnic tables.
- Install trailside benches
- Design canoe/kayak dock at the Lake Ponte Vedra tower.
- Construct two benches on Capo Creek boardwalk.

2. Long Term Completion and Ongoing Tasks

- Implement a monitoring strategy to assess resource impacts and institute corrective management actions if indicators begin to approach standards.
- Collect and evaluate information about visitor use and satisfaction.
- Permit and construct canoe/kayak dock at Lake Ponte Vedra tower (if funded).

Appendix 5

Inventory Photographs



Photo 1. Primary entrance into GRWMA on south side



Photo 3. Information kiosk at primary entrance



Photo 4. Check station



Photo 5. Large information kiosk at check station



Photo 6. Small information kiosk at check station



Photo 7. Pedestrian gate between GRWMA and the GTM Reserve



Photo 8. Secondary entrance on Roscoe Rd.



Photo 9. Equestrian parking area at the Roscoe Rd. entrance



Photo 10. Information kiosk at Roscoe Rd entrance



Photo 11. Gated service road on CR 210



Photo 12. Six Mile Landing on U.S. Highway A1A



Photo 13. Northerly view from Lake Ponte Vedra dam



Photo 14. Observation tower on Lake Ponte Vedra



Photo 15. Observation tower on Capo Creek



Photo 16. Viewing platform on Big Savannah



Photo 17. Interpretive panel at Lk. Ponte Vedra tower



Photo 18. Interpretive panel at Capo Creek tower



Photo 19. Scrub interpretive panels



Photo 20. Interpretive shelter at Big Savannah



Photo 21. Interpretive panels at Big Savannah



Photo 22. Interpretive panels at Big Savannah



Photo 23. Kiosk at Booth's Pond



Photo 24. Off-road cyclist taking a break at Booth's Pond



Photo 25. Equestrian mounting station at Lk. Ponte Vedra tower



Photo 26. Hitching rail at Lk. Ponte Vedra tower



Photo 27. Boat ramp at Lk. Ponte Vedra dam

Appendix VI

Comments from the Guana River WMA Recreation Stakeholder Meeting Ponte Vedra Public Library 8/25/2005

Michael Haney, Hunter, United Waterfowlers of Florida
Paula Snellgrove, Hiker, Florida Trail Chapter Chair
Kim Frawley, Off-road cyclist, Suwannee Bike Association
Forrest Penny, GTMNERR
John Veal, Waterfowl hunter
Alex Limbaugh, Hunter/angler
Robert Burks, Paddling outfitter, Gecko Latitudes
Marcy Silkebaken, adjacent homeowner
Roger Van Ghent, Birder, Audubon Society representative
Ken Berk, GTMNERR
Mark Middlebrook, LAMP Board, Consultant for land acquisition
Sue Burdan, Equestrian, St. John's Co. Horse Council
Pam Murphy, Equestrian
Sarah W. Bailey, LAMP Board, Florida Wildlife Federation

The Guana River WMA Recreation Stakeholder Meeting was held in the Ponte Vedra Public Library with 13 stakeholders as listed above representing a variety of interest groups. A synopsis of concerns, comments, and issues raised by those present is summarized below and coded as follows:

- **Will be incorporated into the 2005 plan and implemented.**
- **Will be considered for implementation in future plans.**
- **Outside the scope of this plan.**

Signage Comments:

Post public hunting calendars at visitor contact points.

Develop more kiosks to inform public about the interrelationships between animals and ecosystem and the economic benefits provided by conservation lands.

Provide more highway, entrance and boundary signs to improve public knowledge about the area and improve perception that it is 'just another pine plantation'.

Boating / Fishing Comments:

Develop boat launch at Mickler Road. Possibly acquire 'Oar House' property that is currently for sale.

Install a dock or some sort of public access near Jenk's Landing – a scenic point and ideal fishing location.

Develop the launch a 6 Mile Landing area. Clear cattails along shoreline to improve access for paddlers.

Improve bank fishing conditions at Booth's Pond.

Allow more auto access days for anglers.

Differentiate in the rules between outboard motors and 'mud motors' or 'go-devils'. Allow higher horsepower mud motors / go-devils than on outboards.

Develop paddling guide that describes the different vegetative patterns and changes as visible from the water.

Hunting Comments:

Improve waterfowl habitat at north end of Lake Ponte Vedra and area near 6 Mile Landing to encourage duck hunters to disperse to different areas of the lake during duck season.

Add several hours per-day, during waterfowl hunting season, for hunters to scout in the afternoon following the close of the morning hunting session.

Consider an alligator harvest. Many duck hunters expressed concerns over the numbers and tenacity of the alligators on Lake Ponte Vedra. Some cited cases where alligators have taken shot fowl before the hunters could get to them.

Recreation Comments:

Consider providing more vehicle access days or provide a golf cart concession for rental to visitors as it is difficult for some birders (and others) to walk more than 2-2.5 miles from the trailheads on a given outing.

Install more benches along trails for the benefit of all hikers/wildlife watchers (especially elder visitors).

Develop a containment area (fence) and improve the parking area surface at the equestrian parking area on the north side.

Develop and implement an equitable WMA user fee. All users should pay the same.

Post trail etiquette information at entrance kiosks. Concerns were expressed over multi-use trails (hikers sharing same pathways with bikers and equestrians).

Public Education / Relations Comments:

The Guana WMA is not known by many locals as a managed area for habitat and species conservation. Explain that area is there for hunters, anglers and wildlife watcher for today and tomorrow. It is NOT a park. Neighbors should not be surprised by the presence of hunters.

Further clarify to local planners and regional governments that the 9,000 acres that is Guana, is not all dry land (approximately half of the property consists of wetlands).

Organize and implement a Citizen's Support Organization for the WMA.

Develop ways for the public to interact with and help the WMA. Build connections with local educational and civic groups to foster a connection to the landscape. Offer an annual open house and fishing days or kids fishing days.

Other Comments:

Implement a recreational use 'carrying capacity' study for the WMA.

Improve access at north end of the property.

FWC and Guana WMA staff should consider participating in the 'A1A Scenic Highway Master Plan' process.

Install a restroom at 6 Mile Landing.

Concerns over fees imposed by FWC and DEP at the new DEP gate and concerns over nighttime access to the WMA after the DEP gate closes at night. Work out an equitable system with DEP for entrance fees/passes.