

3 Public Involvement

**Babcock-Webb Wildlife Management Area (BWWMA)
Management Advisory Group (MAG)
Consensus Meeting Results**

November 6, 2013 in Lehigh Acres, Florida

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

A MAG consensus-building meeting was held on the morning of November 6, 2013, at the Lee County Veterans Park Recreation Center, in Lehigh Acres, Florida. The ideas found below were provided by stakeholders for consideration in the BWWMA 2014-2024 Management Plan with priority determined by vote. These ideas represent a valuable source of information to be used by biologists, planners, administrators, and others during the development of the Management Plan. Upon approval by FWC, the Acquisition and Restoration Council (ARC), and the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), the BWWMA 2014-2024 Management Plan will guide the activities of FWC personnel over the ten-year duration of the plan, and will help meet FWC, state, and Federal planning requirements.

The numbers found in brackets to the left of **bold-faced ideas** listed below represent the total number of votes and the score of each idea. Rank is first determined by **the number of votes** (vote ballot cards received for each idea), and then by score. Score is used to break ties when two or more ideas have the same number of votes. A lower cumulative score indicates higher importance because each voter's highest priority idea (recorded on card #1) receives a score of 1, their second a score of 2, their third a score of 3, their fourth a score of 4, and their fifth score of 5. Ideas not receiving any votes are listed, and were considered during the development of the BWWMA 2014-2024 Management Plan, but carry no judgment with regard to MAG priority.

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

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea #</u>
1.	[18]	[29]	<p>1. Maintain habitat in a healthy condition; restore native pine densities in under-stocked areas; recognize the importance of the mesic flatwoods and dry prairie natural communities. Assess all recreation and management impacts, management decisions and activities emphasizing preservation, restoration and management using science-based research and principles. Conduct a recreation user study for BWWMA; identify and assess the impact of wild hogs on native plant communities.</p> <p>Utilize research, experiences, and fire and mechanical treatments to keep the habitat healthy for many species. Native pines are considered an important part of maintaining a healthy habitat. Need to emphasize the importance of scientific research as a component of management. Management activities should be conducted based upon best available science.</p>
2.	[11]	[32]	<p>15. Provided and enhance wildlife habitat connectivity; emphasize the strategic landscape value for wide-ranging wildlife species; improve regional connectivity of adjacent public lands (master planning); work with FDOT (and others) to develop wildlife underpasses (e.g. SR 31).</p> <p>Results from a 2006 study contracted by FWC and the US Fish and Wildlife Service (USFWS), found that the best optimal expansion zone for the panther includes the Babcock Ranch Preserve, BWWMA, and Fisheating Creek complex. Panthers are breeding south of the Caloosahatchee but are not habitually making it north, especially females. Connectivity means providing a wildlife corridor for the expansion of panther range. Wildlife underpasses should be strategically located and constructed. The USFWS is modeling for panther habitat and found that areas cannot have a dense road network. Once you get beyond a certain road density, panthers and bears won't occur. FWC should work with the other land owners and regional master planning. FWC should conduct biannual meetings to see how interested entities can work together and coordinate activities.</p>

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea #</u>
3.	[10]	[29]	17. Develop and implement a comprehensive regional hydrological assessment; restore hydrology to the Yucca Pens Unit; restore and maintain hydrology to promote sheetflow; continue to work with FDOT and the Charlotte Initiative regarding I-75 expansion. FWC should implement the hydrological plans that have been developed. There are at least two hydrological plans that have been developed; these plans need to be funded and implemented. Work with the Charlotte Harbor Initiative collaboratively to address hydrological issues, especially related to the expansion of I-75. Yucca Pens Unit is drained by Gator Slough, posing hydrological challenges. To reduce roads that impede water flow, maintain the wilderness character of BWWMA. Make sure the hydrology and associated natural communities are maintained.
4.	[9]	[31]	44. Continue current uses, including hunting and fishing; continue and improve designated field trial area; recognize acquisition history including use the of Federal Aid in Wildlife Restoration Act (Pittman-Robertson) funding. Self-explanatory.
5.	[7]	[25]	9. Develop a more integrated/comprehensive exotic invasive plant management program; coordinate prescribed burning with exotic plant treatments. Increase educational to inform people about exotics species. Spraying cogon grass, melaleuca, etc. before prescribed burning is an effective treatment. Cogon grass can expand after a burn if not treated beforehand.
6.	[6]	[19]	41. Expand small game hunting season opportunities; consider establishing a turkey season; control alligators through public hunting and licensed harvesting (professional trapping). Expand the small game season to allow for additional dove hunting early, and snipe later in the small game season, to take better advantage of the open migratory bird season. Many bird hunters use dogs and ride horses. Some bird dogs have been taken by alligators. A licensed agent of the State should be used to control the alligators on the field trial area and Boy Scout area. In coordination with FWC staff, FWC should implement an alligator youth hunt. Alligator hunting would increase safety, as well as an opportunity to add a hunting experience.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea #</u>
7.	[5]	[15]	<p>26. Prioritize quail management and quail hunting opportunities; enhance the quail population; utilize roller-chopping, prescribed fire, and food plots to improve quail habitat; expand habitat improvement to include additional food plots and institute feeding.</p> <p>Because one of the important reasons for acquisition of the area was quail hunting, enhancing the quail population should be a top priority.</p>
8.	[4]	[8]	<p>2. Don't reduce current multi-use activities; plan and develop a technical mountain bike trails (single track); improve and increase parking at Yucca Pens Unit to include horse trailers; establish horse trails in Yucca pens Unit.</p> <p>There are a lot people in the county that mountain bike, but Lee County only has one mountain biking trail and it attracts many users. The existing Lee county trail is about 10 miles. The Florida Mudcutters bicycle organization has about 100 members and are seeking a trail that would provide more mileage, not necessary more technical thrills. Mountain bike trails are good for the economy and attract many tourists. Mountain biking is actually a low impact sport. Bicyclists share trails with wildlife. There's very little construction involved, and Florida Mudcutters don't attempt to change the terrain, but rather work with what's there. Even a 10 mile trail doesn't require a lot of area. For example, the other Lee County trail is contained within 400 acres. The trail could be in either BWWMA unit but the Florida Mudcutters is emphasizing it for the Yucca Pens Unit; perhaps the portion I-75 and US 41 could be a good area because it's not heavily hunted. Currently at the Yucca Pens Unit there's only room for two horse trailers, so parking and associated horse trails should be established.</p>
9.	[4]	[13]	<p>5. Ensure the continued identification and protection of imperiled plants; continue the mapping of imperiled plant species.</p> <p>Make sure the native plant communities endure, and imperiled plants are considered during management activities. Map imperiled plant species occurrences, and submit the occurrence records to FNAI for use by FWC and other agencies.</p>

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea #</u>
10.	[4]	[15]	50. Maintain and develop facilities and infrastructure. Gun range improvements, maintain roads, and maintain facilities.
11.	[4]	[16]	31. Improve interpretation and education, including kiosks describing the increased loss of habitat from ongoing population growth, and the importance of public conservation lands. Better promote existing educational resources. When talking about the Babcock-Webb Unit it seems like people only bring up the shooting range; there should be more emphasis on what else is there. It is important to get information to the schools and allow children to get out and experience the natural resources. There are extensive environmental education programs in Charlotte and Lee Counties with which BWWMA should coordinate.
12.	[2]	[5]	7. Provide additional recreational access to the eastern portion of the Babcock-Webb Unit. If there is east side access people will be able to experience it more. It will provide greater usage of the entire area. Provide additional access from SR 31. Investigate automatic gates, manning an additional check station, or providing horse and pedestrian access only via a walk-around entrance.
13.	[2]	[6]	37. Maintain and enhance the red-cockaded woodpecker (RCW) population and management program. Management of this Federally endangered species needs to be a priority.
14.	[2]	[7]	16. Include a management plan section to address impacts of Babcock Ranch Community. The development is sited immediately to the southeast of BWWMA, with many planned residential dwelling units. SR 31 will have to be expanded (to 4 or 6 lanes) as well, and this will impact BWWMA.

Two items of equal rank:

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea #</u>
15.	[2]	[8]	46. Pursue additional outside funding partners. Self-explanatory.
15.	[2]	[8]	48. Conduct formal cooperative education programs with area schools including field trips, teacher training, interpretive programs, and hire dedicated staff. Self-explanatory.
16.	[2]	[9]	36. Assess off-road vehicle impacts. A study to determine the impacts of off-road vehicle use on BWMA is needed.
17.	[1]	[2]	18. Increase invasive predator control. Coyotes are a growing problem on BWWMA, impacting other wildlife species. Expand the seasons allowing predator hunting.

Two items of equal rank:

18.	[1]	[4]	10. Allow managers to prescribe burn as necessary. Managers should be allowed the flexibility to burn when and how they need to.
18.	[1]	[4]	39. Establish a non-hunting recreation unit. Many people don't use the area because of safety concerns relating to firearms and hunting. Having a non-hunting area would bring more people to the area.

Three items of equal rank:

19.	[1]	[5]	28. Install automatic gate on eastern end of Tucker Grade. Self-explanatory
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<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea #</u>
19.	[1]	[5]	35. Improve deer and hog habitat. Allow prescribed fire and roller-chopping of areas that need it, but don't reduce vegetation throughout the area. The BWWMA should have a variety of habitat types, including more areas with cover for species like deer and hog. This is consistent with providing habitat for panthers and bears as well.
19.	[1]	[5]	40. Rotate prescribed fire timing between dormant and growing seasons. Don't burn all burn units the same way each year, but rather rotate the timing of burning each unit between growing and dormant seasons. Different effects are obtained based on when you burn during the year, and how you rotate burning seasons.

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

- 8. **Reduce the size of prescribed burn blocks.**

Wild turkeys require a variety of different habitat types (i.e. a mosaic). Turkeys don't have a large home range so when you burn 1000 acres of habitat at a time you create monocultures which are not optimal for turkeys. Studies have shown increased quail and turkey populations with smaller burn units.
- 14. **Acquire inholdings.**

This will increase the conservation area, reduce the cost of management, and address management challenges.
- 19. **Protect and manage cultural resources.**

Most of the cultural resources are linear. There is one site that needs to be included in the management plan.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea #</u>
			<p>20. Enhance Florida scrub-jay habitat.</p> <p>There is a part of BWWMA that might be a good habitat for the Florida scrub-jay. FNAI historic native community mapping would help to identify suitable areas, and help determine the efficacy of managing for Florida scrub-jay.</p>
			<p>22. Improve and expand camping opportunities.</p> <p>There is a need in the area for more camping because many of the sites remain occupied, especially during the winter. Electricity would be very useful at many of them. Users come to the BWWMA for a variety of reasons, and if you want to open a place for multi-use it helps to have improved campsites. Expanded camping would also generate revenue.</p>
			<p>25. Manage and restore groundcover within slash pine stands.</p> <p>Utilize burning to promote ground cover.</p>
			<p>27. Improve management coordination between Babcock Ranch Preserve and BWWMA. Self-explanatory</p>
			<p>38. Describe the history and success of Webb Lake in the management plan.</p> <p>People should know about the success of Webb Lake.</p>
			<p>38. Assess impacts of the federal listing of bonneted bat.</p> <p>Determine if the listing of this species will have any impacts on the management of BWWMA.</p>
			<p>53. Assess public access connection possibilities over US 41. Self-explanatory</p>

**Babcock-Webb Wildlife Management Area
MAG Meeting Participants**

<u>Name</u>	<u>Affiliation</u>
Active Participants	
Mike Kemmerer	FWC Area Biologist
Guy Carpenter	FWC Law Enforcement
Paul O'Connor	Lee County Planning Department
Stephanie Green	Southwest Florida Water Management District
Steve Smith	Babcock Ranch Preserve
John Broderick	Kitson & Partners
Cathy Loyola	Florida Native Plant Society
Jim Knoy	Peace River Audubon Society
Bobby Andreu	Southwest Florida Outdoorsman Association
Kim Dryden	US Fish and Wildlife Service
EJ Hornick	Florida Mudcutters
Butch Mallett	Florida Forest Service
Beth Brown	Associated Field Trial Clubs of Florida
Matthew Schwartz	South Florida Wildlands Association
Kevin Main	Archbold Biological Station
Jennifer Manis	Florida Department of Environmental Protection
Scott Ford	Quail Forever
John Phillips	Greater Charlotte Harbor Sierra Club
Andy Stevens	Charlotte County Community Services Department
Derek Alkire	National Wild Turkey Federation
Jo Harder	Caloosa Saddle Club
Supportive Participants	
Jeff McGrady	FWC Habitat and Species Conservation (HSC), Regional Biologist
Chad Allison	FWC HSC, District Biologist
Jennifer Korn	FWC HSC, Landowner Assistance Program
Pete Diamond	FWC HSC, Landowner Assistance Program
Tom M. Matthews	FWC Office of Public Access and Wildlife Viewing Services (OPAWVS)
Jason Burton	FWC Division of Hunting and Game Management
Matt Ralzek	FWC Law Enforcement
Steve Shattler	Red-cockaded woodpecker expert
Ron Gulau	Quail Forever
Nigel Morris	Quail Forever
Charles Whitford	Florida Mudcutters
Mike Liggins	Florida Mudcutters
John Weatherholt	Hunter Safety Southwest Regional Coordinator
Invited but Unable to Attend	

Lewshane Hall
Ben Brown
Danny Quick
Gary Graef

Chuck Wilson
Frank Mann
Greg Graham
Holly Shackelford

FWC Planning Personnel

David Alden
Gary Cochran
Jennifer Tucker
Julie Kilgore

Hall Ranch
Lee County Archery Club
Charlotte County Planning Department
Charlotte Harbor Friends of the National Rifle
Association
Florida Trail Association
Lee County Commission
Boy Scouts of America
Charlotte Soil and Water Conservation District

Facilitator
Land Conservation and Planning Administrator
Recorder
Recorder

NOTICE

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

PUBLIC HEARING

for the

Babcock Webb Wildlife Management Area Management Plan

Charlotte County, Florida

7:00 P.M. Thursday December 5th, 2013

Charlotte Harbor Event and Conference Center
Myakka River Room AB
75 Taylor St
Punta Gorda, FL 33950

PURPOSE: To receive public comment regarding considerations for the FWC ten-year Land Management Plan for the Babcock Webb Wildlife Management Area (BWWMA). This hearing is being held **EXCLUSIVELY** for discussion of the **DRAFT Babcock Webb WMA Management Plan**. This meeting is not being held to discuss area hunting or fishing regulations. For more information on the process for FWC rule and regulation development go online to: myfwc.com/about/rules-regulations/rule-changes/ or call (850) 487-1764.

A Management Prospectus for the Babcock Webb WMA is available upon request. For a copy, please contact Julie Kilgore, Florida Fish and Wildlife Conservation Commission, Land Conservation and Planning, 620 South Meridian Street, Tallahassee, Florida 32399-1600. Telephone: (850) 487-7063.

NOTICE:

The Florida Fish and Wildlife Conservation Commission (FWC) announce a PUBLIC HEARING for the FWC Lead Managed Portions of Babcock Webb Wildlife Management Area located in Charlotte County, Florida.

7:00 P.M. Thursday, December 5th, 2013
Charlotte Harbor Event and Conference Center
Myakka River Room AB
75 Taylor St
Punta Gorda, FL 33950

PURPOSE: To receive public comment regarding considerations for FWC's ten-year Management Plan for the FWC Lead Managed Portions of Babcock Webb Wildlife Management Area (BWWMA).

This hearing is being held EXCLUSIVELY for discussion of the DRAFT Babcock Webb WMA Management Plan. This meeting is not being held to discuss area hunting or fishing regulations. For more information on the process for FWC rule and regulation development go online to: <http://myfwc.com/conservation/terrestrial/management-plans/upcoming/> or call (850) 487-1764.

A Management Prospectus for Babcock Webb WMA and copy of the agenda is available upon request from the Florida Fish and Wildlife Conservation Commission, Land Conservation and Planning Group, 620 South Meridian Street, Tallahassee, Florida 32399-1600. Telephone: (850) 487-9982 or (850) 487-7063 or by e-mail at Julie.Kilgore@myfwc.com

For immediate release: **November 25th, 2013**
Contact: Diane Hirth, (850) 410-5291

Public hearing to outline 10-year management plans for FWC Lead Managed Portions of Babcock Webb Wildlife Management Area

The Florida Fish and Wildlife Conservation Commission (FWC) will hold a public hearing in Charlotte County to present the 10-year draft land management plan for the FWC Lead Managed Portions of Babcock Webb Wildlife Management Area (BWWMA). The meeting will be held on Thursday December 5th, 2013 starting at 7 p.m. at the Charlotte Harbor Event and Conference Center, Myakka River Room AB, 75 Taylor St, Punta Gorda, FL 33950.

After the presentation, the public is encouraged to comment and ask questions about the specifics in the draft plan.

All lands purchased with public funds must have a management plan that ensures the property will be managed in a manner that is consistent with the intended purposes of the purchase.

“Babcock Webb WMA was purchased in order to ensure the preservation of fish and wildlife resources, other natural and cultural resources, and for fish and wildlife-based public outdoor recreation,” said Rebecca Shelton, FWC land conservation biologist. “This draft plan will specify how we intend to do that.”

She added that hunting and fishing regulations are not included in this plan or meeting; those are addressed through a separate public process.

To obtain a copy of the draft land management prospectus for Babcock Webb WMA please call Julie Kilgore at 850-487-7063 or email Julie.Kilgore@MyFWC.com.

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

RS/HSC

PUBLIC HEARING REPORT
FOR THE
BABCOCK-WEBB WILDLIFE MANAGEMENT AREA
MANAGEMENT PLAN
HELD BY THE
BABCOCK-WEBB WMA MANAGEMENT ADVISORY GROUP
AND THE
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
DECEMBER 5, 2013 – CHARLOTTE COUNTY, FLORIDA

The following report documents the public input that was received at the Babcock-Webb WMA Wildlife Management Area (BWWMA) Management Advisory Group's (MAG) Public Hearing for the update to the Management Plan for BWWMA that was held at 7:00-9:00 PM, on December 5, 2013, at the Charlotte Harbor Event and Conference Center in Punta Gorda, Florida.

BWWMA Management Advisory Group Introduction:

The public hearing was introduced by Nigel Morris, a BWWMA MAG participant, who represented the Quail Forever Stakeholder Group. Mr. Morris indicated that he was one of twenty-one stakeholders that attended the Florida Fish and Wildlife Conservation Commission (FWC) facilitated MAG meeting held on November 6, 2013. Mr. Morris explained how the stakeholders developed management suggestions during the MAG meeting and how these ideas were condensed, ranked, and included in a MAG meeting report and considered in development of the Draft Management Plan. Mr. Morris stated that the Draft Management Plan was being presented tonight by FWC staff, and that hardcopies of the Draft Plan and the MAG meeting report were available at the front door for the public's review. Mr. Morris thanked everyone for attending and then introduced FWC staff Mr. Gary Cochran, Land Conservation and Planning Administrator, FWC, to facilitate and coordinate the presentation of an overview of BWWMA; FWC's planning process, and the draft components of the Management Plan.

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

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

were available at the door for public review, including the Draft Management Plan and the BWWMA MAG Meeting Report and Accomplishment Report. Mr. Cochran then presented the agenda for the public hearing and facilitated the introduction of all FWC staff in attendance to the audience. Mr. Cochran then presented an overview and orientation of BWWMA, including a description of the natural communities, data about park visitors, money generated for the state by the park, wildlife species, recreational opportunities found on the area, surrounding conservation lands, surrounding Florida Forever lands, acquisition history, etc. He also explained FWC's planning process and asked if there were any questions regarding that process.

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

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

Public Question: An anonymous member of the public asked how visitation rates were tracked at BWWMA.

FWC Response: Mr. Tom Matthews, FWC Recreation Planner, explained that the visitor estimate for BWWMA included the total count of everyone on the area and included Babcock Ranch Preserve, tracked primarily through vehicle counters. Mr. Matthews explained that there are monthly counts from magnetic vehicle counters located at the entrances to BWWMA and that the vehicle counts are calibrated. No further questions were asked regarding this part of the public hearing presentation.

Presentation of the BWWMA Draft Management Plan:

At this point, Mr. Cason Pope, the BWWMA Biological Scientist II filling in for Area Biologist/Manager Mike Kemmerer, presented the draft management intent, goals and objectives, and other components of the BWWMA Draft Management Plan.

Questions and Comments on the BWWMA Draft Management Plan Presentation:

Mr. Cochran encouraged everyone to fill out a speaker card for public testimony. He informed them that all cards will be considered equally.

Public Comment: An anonymous member of the public noted that Florida panthers are listed in the draft plan as occasionally occurring on BWWMA and inquired how many were documented there, along with Florida black bears. He also referenced the accomplishment

report, which stated there has been a decline in deer populations and asked why the FWC biologists thought that was occurring.

FWC Response: Ms. Jennifer Myers, an FWC Conservation Biologist, responded that panthers do occasionally use WMAs and other conservation lands north of the Caloosahatchee River but that they haven't been counted at BWWMA and it is a rare occurrence to have them documented. She also stated that bears are present in the area, more to the south where they are closer to the Big Cypress population. One or two bears were reported in the last year. Both bears and panthers are rare on BWWMA but that doesn't necessarily mean they aren't there. Mr. Cochran adds that in areas north of the Caloosahatchee River, young panther males tend to be the ones to disperse. FWC Regional Biologist, Mr. Jeff McGrady noted that the deer population decline described in the accomplishment report was an error and that this decline was supposed to describe quail and had been recorded in the wrong row of the accomplishment report table and would be corrected.

Public Question: An anonymous member of the public attendees inquired about submitting written comments and was directed to submit them by e-mail.

FWC Response: Mr. Cochran informed the attendees that anyone may submit written comments and comments will be accepted until the Management Plan is presented to the Acquisition and Restoration Council.

Public Comment: An anonymous member of the public attendees noted that wild hogs are listed as a nuisance animal but the regulations say there is one per season bag limit. He inquired if they are a nuisance animal or a game animal.

FWC Response: Mr. Cochran responded that FWC considers wild hogs to be a nuisance species and they are managed through harvest. There is an objective in the Draft Management Plan to obtain a study on the impacts of wild hogs. It was also noted that the Yucca Pens Unit hunting regulations do not include a size or bag limit on wild hogs.

Public Question: An anonymous member of the public attendees noted that page 34 of the Draft Management Plan includes an objective to designate up to 20 miles of trails and wanted to know if this objective includes a mountain bike trail. He said his group, the Florida Mudcutters, asked specifically to have a cross country trail for mountain bikes on BWWMA.

FWC Response: Mr. Tom Matthews, FWC, replied that this mileage will include mountain bike trails, but they will most likely not be technical trails. A lot of the trails will be on existing off road trails and exact plans will be developed during the BWWMA Recreation Master Plan update, which will occur during the next six months. Mr. Cochran added that recreation on FWC WMAs primary purpose is to provide quality opportunities for the public to have a connection with wildlife and be wildlife oriented.

Public Question: An anonymous member of the public attendees stated that the Draft Management Plan includes approximately 1,200 acres of roller chopping per year at BWWMA and wanted to know how many acres have been chopped this year, how roller chopping affects plants and wildlife, and what damage is being done to deer, hog, and quail habitat. He felt 1,200 acres per year is a lot, especially when combined with burning and that it is reducing cover by too much.

FWC Response: Mr. Pope, FWC, responded to the inquiries and comments by stating that to the staff's knowledge, the roller chopping isn't negatively affecting a large portion of habitat. Staff tries to direct roller chopping to be conducted in strips and smaller pockets so as not to impact a large area. Mr. Jeff McGrady, FWC, noted that the goal behind roller chopping is to reduce palmetto coverage. Palmetto coverage has been increasing overtime and out-competing other species. He explained that they've chopped very aggressively over the last few years to take advantage of available funding. We should expect that the amount we have to chop should reduce each year. Area staff uses contractors to roller chop and there are sometimes communication errors between staff and contractors. Mr. Cochran added that FWC's Objective-based Vegetation Management (OBVM) program guides habitat management activities and that management actions can be modified if monitoring suggests the activity is damaging or ineffective.

Public Question: An anonymous member of the public attendees asked why coyotes aren't mentioned in the Plan and not considered for hunting as hogs are.

FWC Response: Mr. Cochran replied that coyotes are native to North America and have moved into the east on their own through a natural range expansion, whereas hogs were introduced to Florida by the Spanish. Mr. McGrady also noted using hunting as a control measure for coyotes would likely not be effective, based on the experience of people trying to eliminate them in the western U.S.

Public Question: An anonymous member of the public attendees said that contractors might be roller chopping in areas they aren't supposed to and leaving palmettos in other areas. He noted that contractors appear to be working in open fields. He also asked why FWC doesn't supervise the contractors while they roller chop.

FWC Response: Mr. McGrady explained that staff doesn't have enough time to check on the contractors every day but they do periodic checks. Mr. Chad Allison, FWC District Biologist, said he is interested in knowing if the roller chopping contractors are chopping in appropriate areas or seem to be chopping too many acres. He also noted that roller chopping is used to prepare for pine plantings so visitors may have come across that and thought it looked like a field had been roller chopped for no reason. Mr. McGrady asked the public to stop by the BWWMA office and inform the biologists if they see inappropriate roller chopping practices occurring. Mr. Cochran noted that low staffing levels affect FWC's ability to monitor management actions such as contracted roller chopping, and that the minimum ratio of staff should be one full-time equivalent (FTE) staff person for every 5,000

acres. Currently, BWWMA has eight Full Time Equivalent (FTE) employees but according to the minimum staff ratio, it should have at least 16 FTE employees.

Public Question: An anonymous member of the public attendees asked if license fees and daily use fees go into general revenue or go directly to FWC and how much of FWC's budget they comprise.

FWC Response: Mr. Cochran responded that the funds are earmarked for FWC and appropriated through the legislature. Mr. Cochran did not have the percentage that fees and licenses make up for the total budget, but he noted that it is a small part of the overall operating budget for FWC and land management funding for FWC WMAs. The majority of FWC funding comes from the Conservation and Recreation Lands Trust Fund, which is funded by public record documentary stamps that are charged any time a public document is recorded in the respective County's Public Records. FWC also receives funding through the U.S. Fish and Wildlife Service federal grant-in-aid Pittman-Robertson Wildlife Restoration Act.

Public Question: An anonymous member of the public attendees commented that quail and indigo snakes are managed by keeping areas open and through prescribed burning. He inquired as to why prescribed burns can't be conducted at night so as to reduce fire intensity and risk of tree loss. He noted that prescribed burns were being conducted when chicks might be coming out.

FWC Response: Mr. Chad Allison, FWC, addressed these comments and said most burning is conducted in the dormant season from December through February and sometimes into March. Burning at night adds another level of complexity and burden for staff that already works very hard to keep up the prescribed burning program. Mr. Allison stated that weather parameters and the workload make night burning less feasible as a large component of the burn plan at BWWMA. Management actions, including burning and roller chopping, are done based on best management practices from the literature. Mr. Allison stated that BWWMA has one of the most successful burn programs of any of the FWC properties and other state properties. Mr. Allison said that the goal is to burn in a mosaic so that the habitat is improved and hatchling success is improved overall. The burn program at BWWMA has been refined through the use of strips and a checkerboard pattern.

Public Question: An anonymous member of the public attendees asked if the Florida Forest Service (FFS) helps with the burn program at BWWMA and if not, could they be involved.

FWC Response: Mr. Allison responded that all burning is done in house and conforms to burn practices for wildlife. FWC works with the FFS during training and the FFS authorizes prescribed burns on WMAs.

Public Question: An anonymous member of the public attendees asked if there are additional parking areas planned, specifically in the interior of BWWMA or off of State Road 31.

FWC Response: Mr. Tom Matthews, FWC, said that the Recreation Master Plan update will address increased parking and FWC plans to improve parking at the Yucca Pens Unit as well as conduct a feasibility study for parking on SR 31. Mr. Matthews said that at this point, FWC hasn't considered increasing parking in the interior of BWWMA but it can be considered.

Public Comment: An anonymous member of the public attendees commented that is it important to remember BWWMA is not an island and there is a lot going on in the area. There is value in a long-term study to determine the patterns of wildlife movement in the area.

Public Question: An anonymous member of the public attendees noted that nuisance bears have been relocated to Webb in the last few years and wanted to know if they were collared and tracked.

FWC Response: Mr. McGrady replied that the bears are not collared and that nuisance bears have been relocated to Babcock Ranch Preserve as well as at BWWMA. All bears that were released have either been euthanized or are no longer on BWWMA. Bears released at BWWMA don't stay in the area because there is not enough cover for them.

Public Question: An anonymous member of the public attendees asked if FWC has a policy for conducting Off Road Vehicle (ORV) studies.

FWC Response: Mr. Cochran replied that the ORV study listed as an objective in the Draft Management Plan is a recommendation and would be similar to how FWC has studied grazing impacts on WMAs. ORV impacts haven't been studied or documented so FWC cannot categorically state if the impacts are significant. The recommendation to include an ORV study came out of the MAG meeting as well as a suggestion from the Acquisition and Restoration Council.

Public Testimony on the BWWMA Draft Management Plan:

Six members of the public audience submitted speaker cards indicating their intention to provide formal public testimony. Mr. Cochran again emphasized that the public hearing was for taking input regarding the BWWMA Draft Management Plan and called the first speaker to the podium.

Public Testimony Comment: Mr. Shearer decided he did not want to provide public testimony.

Public Testimony Comment: Mr. Robert Andreu, representing Southwest Florida Outdoorsman Association stated that he attended the MAG meeting in Lehigh Acres as a representative of the Southwest Florida Outdoorsman Association. He stated that there haven't been many positives since the 2003 Babcock WMA Management Plan and that quail, deer, and hog populations are down. Mr. Andreu strongly emphasized that excessive roller chopping at BWWMA should stop because it is negatively affecting the other wildlife. He noted that quail are the emphasis on the area but they also eat palmetto berries. The deer harvest was low this year, only 65 deer for the 800 hunters and hunter guests. Roller chopping has got to stop because it is doing too much damage. Hunters find quail all the time in the palmettos. Mr. Andreu stated that staff needs to allow 3-5 years for palmetto coverage to build back up. He also stated that hog harvest levels are significantly down from historic levels.

Public Testimony Comment: Mr. Scott Ford, representing Quail Forever, stated that he also hunts deer at BWWMA and can attest to lower deer harvest rates. Quail Forever does not support a buggy [ORV] study listed in the Draft Management Plan. Mr. Ford stated that buggies are a tradition at BWWMA that has been ongoing since the beginning of use on the area. Mr. Ford stated that the data from a buggy study could be construed either way to support buggy use or to try to eliminate it. People of advanced age might be excluded from the area if they can't use buggies. Quail Forever supports all increased hunting opportunities. If buggies are removed, it will mean a lot of people won't be able to hunt birds.

Public Testimony Comment: Mr. Nigel Morris, representing Quail Forever, stated that quail populations have been in decline nationwide since the early 1980s. The Northern bobwhite conservation initiative was formed as a result of this decline. The initiative concluded that habitat quantity and quality are the biggest factors in quail declines. Since 1982, quail have been in decline at BWWMA. From 1952-1982, the average annual quail harvest rate was around 4,500 birds. The current harvest rate is less 1,000 birds per year.

The BWWMA Management Plan needs to include much greater emphasis on quail management. Mr. Morris supported Mr. Ford's stance that ORVs are necessary for quail hunting at BWWMA. Mr. Morris also noted that palmetto coverage of 35% or greater will reduce the presence of quail.

Public Testimony Comment: Mr. Robert Edwards submitted a speaker card but decided not provide public testimony.

Public Testimony Comment: Mr. Matthew Schwartz, representing the South Florida Wildlands Association stated that he was a member of the BWWMA MAG. Mr. Schwartz commended the Draft Management Plan's inclusion of a Draft Optimal Conservation Planning Boundary (OCPB) and the Wildlife Conservation Prioritization and Recovery Strategy. Mr. Schwartz referenced FWC's Wildlife 2060 report, which describes potential effects development and population expansion could have on Florida's wildlife and

conservation areas. Mr. Schwartz noted that the Wildlife 2060 report estimated a loss of 7 million acres of habitat by 2060. Mr. Schwartz mentioned that BWWMA is surrounded by development and agricultural operations and FWC should consider the impacts of development around the area. Mr. Schwartz recommended that the Management Plan include maps of habitat, development, and the OCPB. The Management Plan should show the development around the BWWMA as well as the amount of acreage that has been lost to development.

Adjournment:

Mr. Cochran asked if there were any other members of the public that wished to give public testimony. Having received no further requests to give public testimony, Mr. Cochran then declared the public hearing adjourned.

4 Land Management Review

Name of Site: Babcock-Webb WMA, Yucca Pens Unit **County:** Charlotte/Lee County
Managed by: Fish and Wildlife Conservation Commission **Acres:** 14,577.00 Acres
Area Reviewed: Entire tract
Review Date: 02/25/13 **Management Plan Approval Date:** 01/15/08



Review Team Determination

Managed in accordance with Acquisition purpose? Yes =7, No = 0



Management practices, including public access, in compliance with the management plan? Yes =7, No = 0



Categories	Management Plan Review	Field Review
Natural Communities	0.69	4.08
Listed Species	0.83	3.82
Natural Resource Survey	0.77	3.81
Cultural Resources	0.71	3.64
Prescribed Fire	0.67	3.76
Restoration	0.86	3.75
Exotic Species	0.29	3.32
Hydrology	0.86	3.38
Groundwater Monitoring	0.29	2.83
Surface Water Monitoring	0.57	4.29
Resource Protection	0.93	4.02
Adjacent Property Concerns	0.79	3.08
Public Access & Education	0.84	3.41
Management Resources	N/A	3.55
Managed Area Uses	1.00	N/A
Buildings, Equipment, Staff & Funding	N/A	3.54

Consensus Commendations to the Managing Agency

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

1. The team commends FWC for cooperatively initiating the Charlotte Harbor Flatwoods Initiative, focusing on regional hydrological issues and landscape restoration. (VOTE: 7+, 0-)

★★★★★★

2. The team commends FWC for their ongoing efforts to treat and monitor an extensive list of invasive plant populations that occur throughout this property. In particular, the reduction of melaleuca has been extraordinary. (VOTE: 7+, 0-)

★★★★★★

Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The management plan must include responses to the recommendations identified below.

1. The team recommends that FWC increase the application of prescribed fire, particularly to maintain areas where restoration has been initiated, and where maintenance condition has been achieved or nearly achieved. Consideration should be given to increase funding for existing staff or explore funding for contract burning. (VOTE: 7+, 0-)

★★★★★★

Managing Agency Response: FWC notes that "Resource Management, regarding area being burned (no. acres) and quality" in the Field Review Checklist Findings (below) indicate that FWC "received high scores on the review team checklist, which indicates that management actions exceeded expectations." The Yucca Pens Unit, due its juxtaposition in a SW Florida coastal county, presents smoke management issues that make it particularly challenging to keep fire-maintained communities within the target fire return interval. FWC is working on a regional fire contract to aid in maintaining prescribed burning goals at the Yucca Pens Unit in addition to the 65,758-acre Fred C. Babcock/Cecil M. Webb WMA, and will continue to work to achieve established fire return intervals for the pyrogenic communities on the area.

Field Review Checklist Findings

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

- Natural Communities, regarding mesic/wet flatwoods, mesic hammock, basin swamp, basin marsh, depression marsh and wet prairie.
- Listed Species, regarding animal inventory, red cockaded woodpecker, Florida bonneted bat and plant inventory, Florida beargrass and beautiful pawpaw.
- Natural Resources, regarding listed species or habitat monitoring, other non-game species or habitat monitoring, fire effects monitoring, other habitat management effects monitoring and invasive species survey/monitoring.
- Cultural Resources, regarding protection and preservation.
- Resource Management, regarding area being burned (no. acres) and quality.
- Restoration of Ruderal Areas, regarding charlotte flatwoods hydrological initiative.
- Forest Management, regarding timber inventory.
- Non-Native, invasive & problem species, regarding plant control.
- Resource Protection, regarding the boundary survey, gates/fencing and signage.
- Public Access & Education, regarding roads and parking.
- Environmental Education & Outreach, regarding recreational opportunities and management of visitor impacts.

- Management Resources Maintenance and Infrastructure, regarding sanitary facilities, buildings and equipment.

Items Requiring Improvement Actions in the Management Plan

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than .5 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The management plan must include responses to the checklist items identified below:

1. The review team average score indicates a need for acknowledgement of protection and preservation of listed species, specifically Florida bonneted bat. Please provide documentation in the management plan.

Managing Agency Response: The last documented natural roost occurrence on BWWMA of this species was in 1979. However, recent audio recordings provide evidence of its continued existence in several south Florida counties (one colony was even discovered in a bat house in Lee County in 2003). FNAI element occurrence data indicates a 2008 location. As part of FWC's Wildlife Conservation Prioritization and Recovery (WCPR) program, FWC will evaluate if reference and management actions for this species are appropriate for inclusion in the update to the BWWMA management plan.

2. The review team average score indicates a need for acknowledgement of the deficiencies related to non-native, invasive and problem species, specifically the animal prevention and control and pests/pathogens. Please provide documentation in the management plan.

Managing Agency Response: Use of the terminology "animal prevention" and "pests/pathogens" is not clear to FWC since it is not a required component of management plans. FWC will expand the discussion of exotic species control in the update of the management plan for BWWMA.

3. The review team average score indicates a need for acknowledgement of ground water monitoring, specifically water quantity. Please provide documentation in the management plan.

Managing Agency Response: Hydrology and water monitoring is discussed on pages 39-40 of the current management plan. FWC will continue to cooperate with DEP and the Southwest Florida Water Management District, and will investigate the need and feasibility of expanding water monitoring on BWWMA. A discussion of water monitoring will be included in the update to the BWWMA management plan as appropriate.

PLAN REVIEW		1	2	3	4	5	6	7	AVERAGE
Natural Communities (I.A)									
Mesic/Wet Flatwoods	I.A.2	0	1	1	1	1	1	0	0.71
Mesic Hammock	I.A.3	0	1	1	1	1	1	0	0.71
Basin Swamp	I.A.4	0	1	1	1	1	1	0	0.71
Basin Marsh	I.A.5	0	1	1	1	1	1	0	0.71
Depression Marsh	I.A.6	0	1	1	1	1	1	0	0.71
Wet Prairie	I.A.7	0	0	1	1	1	1	0	0.57
Listed species:Protection & Preservation (I.B)									
Animal Inventory	I.B.1	1	1	1	1	1	1	1	1.00

Red Cockaded Woodpecker	I.B.1.a	1	1			1	1	1	1.00
Florida Bonneted Bat	I.B.1.b	1	0	0		1	0	0	0.83
Plant Inventory	I.B.2	1	1	1	0	1	1		0.83
Florida Beargrass	I.B.2.a	1	1	1	0	1		1	0.83
Beautiful Pawpaw	I.B.2.b	1	1	1		1		1	1.00
Natural Resources Survey/Management Resources (I.C)									
Listed species or habitat monitoring	I.C.2	1	1	1	1	1	0	0	0.71
Other non-game species or habitat monitoring	I.C.3	1	1	1	1	1	0	0	0.71
Fire effects monitoring	I.C.4	1	1	1	1	1	0	1	0.86
Other habitat management effects monitoring	I.C.5	1	1	1	1	1	0	0	0.71
Invasive species survey / monitoring	I.C.6	1	1	1	1	1	1	0	0.86
Cultural Resources (Archeological & Historic sites) (II.A,II.B)									
Cultural Res. Survey	II.A	1	1	1	1	1	0	0	0.71
Protection and preservation	II.B	1	1	1	1	1	0	0	0.71
Resource Management, Prescribed Fire (III.A)									
Area Being Burned (no. acres)	III.A.1	0	1	1	1	1	1	0	0.71
Frequency	III.A.2	0	0	1	1	1	1	0	0.57
Quality	III.A.3	0	1	1	1	1	1	0	0.71
Restoration of Ruderal Areas (III.B)									
Charlotte Flatwoods Hydrological Initiative	III.B.1	0	0	1	1	1	1	1	0.71
Forest Management (III.C)									
Timber Inventory	III.C.1	1	1	1	1	1		1	1.00
Non-Native, Invasive & Problem Species (III.E)									
Prevention									
prevention - plants	III.E.1.a	1	0	1	1	1	0	0	0.57
prevention - animals	III.E.1.b	0	0	0	0	1	0	0	0.14
prevention - pests/pathogens	III.E.1.c	0	0	0	0	1	0	0	0.14
Control									
control - plants	III.E.2.a	1	0	1	1	1	0	0	0.57
control - animals	III.E.2.b	0	0	0	0	1	0	0	0.14
control - pest/pathogens	III.E.2.c	0	0	0	0	1	0	0	0.14
Hydrologic/Geologic function Hydro-Alteration (III.F.1)									
Roads/culverts	III.F.1.a	1	1	1	1	1	1	0	0.86
Ditches	III.F.1.b	1	1	1	1	1	1	0	0.86
Hydro-period Alteration	III.F.1.c	1	1	1	1	1	1	0	0.86
Ground Water Monitoring (III.F.2)									
Ground water quantity	III.F.2.b	0	0	1	0	1	0	0	0.29

Surface Water Monitoring (III.F.3)									
Surface water quantity	III.F.3.b	0	0	1	1	1	0	1	0.57
Resource Protection (III.G)									
Boundary survey	III.G.1	1	1	1	1	1	0	1	0.86
Gates & fencing	III.G.2	1	1	1	1	1	1	1	1.00
Signage	III.G.3	1	1	1	1	1	1	1	1.00
Law enforcement presence	III.G.4	1	1	1	1	1	0	1	0.86
Adjacent Property Concerns (III.H)									
Land Use									
Expanding development	III.H.1.a	0	1	1	1	1	0	0	0.57
Inholdings/additions	III.H.2	1	1	1	1	1	1	1	1.00
Discussion of Potential Surplus Land Determination	III.H.3	1	1	1	0	1	1	1	0.86
Surplus Lands Identified?	III.H.4	0	1	1	0	1	1	1	0.71
Public Access & Education									
Public Access									
Roads	IV.1.a	1	1	1	1	1	1	1	1.00
Parking	IV.1.b	1	1	1	1	1	1	1	1.00
Environmental Education & Outreach									
Wildlife	IV.2.a	0	1	1	1	1	1	0	0.71
Invasive Species	IV.2.b	0	1	1	1	1	1	0	0.71
Habitat Management Activities	IV.2.c	0	1	1	1	1	1	0	0.71
Interpretive facilities and signs	IV.3	0	1	1	1	1	1	0	0.71
Recreational Opportunities	IV.4	1	1	1	1	1	1	1	1.00
Management of Visitor Impacts	IV.5	1	1	1	1	1	1	0	0.86
Managed Area Uses									
Existing Uses									
Fishing	VI.A.1	1	1	1	1	1	1	1	1.00
Hunting	VI.A.2	1	1	1	1	1	1	1	1.00
Horseback Riding	VI.A.3	1	1	1	1	1	1	1	1.00
Nature Study	VI.A.5	1	1	1	1	1	1	1	1.00
Bird Watching	VI.A.6	1	1	1	1	1	1	1	1.00
Hiking	VI.A.7	1	1	1	1	1	1	1	1.00
Bicycling	VI.A.8	1	1	1	1	1	1	1	1.00
Proposed Uses									
Grazing	VI.B.1	1	1	1	1	0	1	1	0.86

Items Requiring Improvement Actions in the Field

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 2.5 score on average). Please note that overall good scores do not preclude specific recommendations by the review team

requiring remediation. The management plan must include responses to the checklist items identified below:

There were no low scores.

FIELD REVIEW		1	2	3	4	5	6	7	AVERAGE
Natural Communities (I.A)									
Mesic/Wet Flatwoods	I.A.2	4	3	3	4	4	5	4	3.86
Mesic Hammock	I.A.3	X	5	4	X	4	X	3	4.00
Basin Swamp	I.A.4	4	5	4	5	5	4	4	4.43
Basin Marsh	I.A.5	4	4	4	4	4	4	4	4.00
Depression Marsh	I.A.6	4	4	4	X	4	X	4	4.00
Wet Prairie	I.A.7	4	X	4	4	4	5	4	4.17
Listed species:Protection & Preservation (I.B)									
Animal Inventory	I.B.1	4	4	4	3	4	4	4	3.86
Red Cockaded Woodpecker	I.B.1.a	5	4			4	4	4	4.20
Florida Bonneted Bat	I.B.1.b	X	3	X		X	X	4	3.50
Plant Inventory	I.B.2	4	4	4	X	4	X	3	3.80
Florida Beargrass	I.B.2.a	X	4	4	X	X	4	3	3.75
Beautiful Pawpaw	I.B.2.b	4	4	4		X	4	3	3.80
Natural Resources Survey/Management Resources (I.C)									
Listed species or habitat monitoring	I.C.2	X	4	4	3	4	X	3	3.60
Other non-game species or habitat monitoring	I.C.3	X	4	4	3	4	5	4	4.00
Fire effects monitoring	I.C.4	4	4	4	4	4	4	3	3.86
Other habitat management effects monitoring	I.C.5	4	4	4	X	4	4	4	4.00
Invasive species survey / monitoring	I.C.6	3	5	4	2	4	3	4	3.57
Cultural Resources (Archeological & Historic sites) (II.A,II.B)									
Cultural Res. Survey	II.A	4	4	4	3	3	3	3	3.43
Protection and preservation	II.B	4	4	4	3	4	4	4	3.86
Resource Management, Prescribed Fire (III.A)									
Area Being Burned (no. acres)	III.A.1	4	3	4	4	4	4	3	3.71
Frequency	III.A.2	3	2	4	4	4	4	3	3.43
Quality	III.A.3	5	3	4	4	4	4	5	4.14
Restoration of Ruderal Areas (III.B)									
Charlotte Flatwoods Hydrological Initiative	III.B.1	4	5	4	2	4	X	4	3.83
Forest Management (III.C)									
Timber Inventory	III.C.1	4	4	3	3	4	X	4	3.67

Non-Native, Invasive & Problem Species (III.E)									
Prevention									
prevention - plants	III.E.1.a	3	4	4	3	3		3	3.33
prevention - animals	III.E.1.b	3	3	3	X	4		3	3.20
prevention - pests/pathogens	III.E.1.c	4	3	3	X	3		3	3.20
Control									
control - plants	III.E.2.a	3	5	4	3	4	3	4	3.71
control - animals	III.E.2.b	4	3	3	X	4	3	3	3.33
control - pest/pathogens	III.E.2.c	4	3	3	X	4	2	3	3.17
Hydrologic/Geologic function									
Hydro-Alteration (III.E.1)									
Roads/culverts	III.F.1.a	4	3	3	3	4	3	4	3.43
Ditches	III.F.1.b	4	3	3	4	4	3	3	3.43
Hydro-period Alteration	III.F.1.c	4	3	3	3	4	3	3	3.29
Ground Water Monitoring (III.F.2)									
Ground water quantity	III.F.2.b	3	2	3	X	3	4	2	2.83
Surface Water Monitoring (III.E.3)									
Surface water quantity	III.F.3.b	5	4	4	4	4	5	4	4.29
Resource Protection (III.F)									
Boundary survey	III.G.1	5	5	5	3	4	5	5	4.57
Gates & fencing	III.G.2	5	5	5	3	4	5	5	4.57
Signage	III.G.3	4	5	4	3	4	5	5	4.29
Law enforcement presence	III.G.4	X	3	2	2	2	4	3	2.67
Adjacent Property Concerns (III.G)									
Land Use									
Expanding development	III.H.1.a	X	3	3	4	3	3	3	3.17
Inholdings/additions	III.H.2		3	3	2	3		4	3.00
Public Access & Education									
Public Access									
Roads	IV.1.a	5	4	5	2	5	3	4	4.00
Parking	IV.1.b	5	4	4	3	4	4	3	3.86
Environmental Education & Outreach									
Wildlife	IV.2.a	3	3	3	3	3	3	3	3.00
Invasive Species	IV.2.b	3	3	3	3	3	3	3	3.00
Habitat Management Activities	IV.2.c	3	3	3	3	3	3	3	3.00
Interpretive facilities and signs	IV.3	3	3	3	3	3	3	3	3.00
Recreational Opportunities	IV.4	4	4	5	4	4	3	3	3.86
Management of Visitor Impacts	IV.5	4	4	4	3	4	3	3	3.57
Management Resources									
Maintenance									
Waste disposal	V.1.a	4	3	4	3	3	4	3	3.43
Sanitary facilities	V.1.b	4	4	5	3	3	X	3	3.67
Infrastructure									
Buildings	V.2.a	4	4	5	3	3	4	4	3.86
Equipment	V.2.b	4	4	4	4	5	X	4	4.17

Staff	V.3	3	4	2	3	4	2	4	3.14
Funding	V.4	2	4	3	3	4	1	4	3.00

Fish and Wildlife Commission Manager and Key Staff Present:

- Mike Kemmerer, Manager

APPENDIX:

The following comments represent individual comments, and may not represent the consensus of the land management review team.

I.A. Natural Communities

- Management plan should be more specific on anticipated fire return interval in actively managed natural communities. Plan just says 'short'. Need to increase application of prescribed fire to maintain what has been accomplished to date, at least. Suggest staff document/report on wet season roller chopping done on north end of property. Manager has a lot of anecdotal information, but something quantifiable would be beneficial, plus it lends more credit to what could be interpreted as an opinion since there is no data to support the statement that growing season roller chopping is beneficial.
- Flatwoods are in target conditions for most of FL but palmetto is still high and dense for this region and percent of wet flatwoods vs. mesic flatwoods.
- 2) Melaleuca is returning, 3) unable to identify 5) ATV damage hydrology is dry 6) unable to identify.
- Keep on top of burn regime to not lose ground on gains made. Exotics preventing from all being 5.
- Area designated Dry Prairie in YPU was full of pine stumps & new recruits, therefore not considered Dry Prairie. Invasives threatening current areas generally in good maintenance condition. Maps too small & difficult to correlate with what we saw on the tour.
- Extraordinary efforts over past years to treat invasive plants on this property, especially as it relates to control of melaleuca. As a result of this work and past efforts at burning, the mesic and wet flatwoods on this tract are largely in maintenance condition. These efforts should all be commended. However, the last 3-4 years, the FWC has focused much of its field work on special quail mgt. activities on the larger Babcock Webb tract. This has meant that no part of Yucca Pens have been burned during the past three years. Also, the superlative accomplishment at invasive plant control have seen reduced funding. All of which threaten these accomplishments and could allow these flatwoods to "fall" out of maintenance condition. More consideration should be given by FWC to finding alternative funding sources and outsourcing options to achieve the desire burn frequency on this property. Suggest the next plan include more information and map details of the natural (FNAI) communities and their current condition and mgt. needs.

I.B. Listed Species

- See note above re cuthroat grass.
- Plan is too quail heavy. Need more info and specifics on listed species.
- Management for habitat sufficient for managing for the rare plants. Bonneted bat needs research; they are occurring in areas in maintenance condition.
- Suggest WMA staff ensure past sightings/map locations of bear grass and beautiful pawpaw be built into their ARC view/gps database and some basic level of monitoring be established.

I.C. Natural Resource Survey/Monitoring Resources

- For invasive species, suggest more involvement in a local CTSMA & working with invasive plant management program to find more resources for treating exotic species.
- Objective needed vegetation monitoring OBVM incorp. all.
- Fish management = hydrology work. Quail research being implemented. Sherman's Fox Squirrel included in incidental reports. Roller chopping effects monitoring in effect. % cover would provide better measure for habitat status AND for invasive species cover. Invasives survey system getting into place/new.
- Incidental wildlife observations are collected. Suggest more effort be made to document and publish the benefits of wet weather roller chopping using transects and photo plots, etc. Excellent effort to treat and monitor invasive plant populations-that documents both location and density of plants.

II.A.B. Cultural Resources

- Staff member trained since last review.
 - 1 staff person trained for FMSF. 1 Archeo site. Low probability of significant resources.
 - Good job getting a FWC staff member trained as an archeological site monitor. No major archeological/cultural sites here.
- III.A. Resource Management**
- Burning must start again soon. Burns haven't happened in 3 yrs. Condition is still good, but will suffer greatly without burns soon.
 - Recommend contract burning to increase application of fire, given that staff have to prioritize quail research on Webb.
 - 2/3rds burned in last 5 yrs.
 - Have burned about 2/3 of pyric communities. Quail research limiting RX fire.
 - As has been stated, after several successful burn cycles, including the burning of 2/3 of this tract in 2008/2009, there has been no burning on this tract over the past three years due to FWC quail research. As a result of the burns on the Babcock/Webb tract, flatwoods is now sliding out of the desired 3 year frequency. Burn units continue however to have all fire lines harrowed annually. Good effort 4-5 years ago in increasing the amount of growing season fire.
- III.B. Restoration**
- WMD seems to have good direction & progress on this.
 - Prevented from restoration by I-75 and US 41.
 - Plan is place to improve flows in Yucca Pen. Through charlotte flatwoods hydrological initiative.
 - Commend staff in working with area partners to resolve problems.
 - Excellent efforts at organizing and planning of a project to increase hydro-period (through ditch blocks) in the flatwoods just north of the Cape Coral development. This is being done in cooperation with SWFWMD.
- III.C. Forest Management**
- Last stand component survey 11 yrs. ago? Do not feel qualified to evaluate this.
 - 2002 Timber Analysis was completed by FFS Other State Lands forester. FWC staff continue to work with FFS forester and plans include training small pine in areas of heavy stocking.
- III.D. Non-native, Invasive & Problem Species**
- Plan should be updated to assure mosquito control does not treat DESIGNATE - biologically sensitive & highly productive lands.
 - Recommend more intensive cleanup of FLOC equipment when transferred between sites to reduce spread of exotic plants.
 - Looking for ways to get neighboring property treated. Decontamination required for contractors. No known way to prevent animals. Goal 2: 1800 acres over 10 yrs. seems insufficient!! % cover reduction better measurement. Now have Nile monitors, tegus, hogs - no take limit, but only during hunt seasons. Pests-nothing major. Have arthropod control for property.
 - Continue to assess need to clean/decontaminate equipment working in exotic infected zones of the property. FWC uses an OPS crew here to effectively in treatment of a very extensive population of invasive plants. Continued efforts are needed to keep up levels of control to avoid repopulation. More focus is necessary to assess population trends for downy rosemary and the impact of current treatment practices.
- III.E. Hydrologic/Geologic Function**
- Working on Problem B strategies (see Restoration & Goal 6). Others doing this; haven't seen need to change or add to it. Quantity impacts habitat directly. USGS & others doing this, esp. for quantity, flow rates. DEP monitors quality up to 41 @ Zemel canal.
 - The mgt. plan needs to do a more thorough job of describing the impact of I-75 and CSX RR on impeding surface flows from east to west. Suggest measures be taken to continue to monitor surficial groundwater levels associated with the gator slough hydrological restoration project. Extensive staff gauge system, recently upgraded to monitor surface water flows.
- III.F. Resource Protection**
- Addition of cattle lease will provide for more law enforcement action.
 - Could use increase patrolling; expecting better enforcement authority. Problem A strategies being implemented.

- Good effort to complete fencing of entire boundary. Still seeing a lot of boundary fence cutting- indicating the need for greater law enforcement presence. A prospective cattle lease should help this with the extra monitoring and higher penalty if caught.

III.G. Adjacent Property Concerns

- No money for inholding acquisition.
- Zemel may decide to develop their lands, which would be a serious problem. Develop ways to work with SHIP, CISMAS, etc., to help adjacent Landowners treat their lands.

IV. Public Access and Education

- Access has been improved for everyone year round (gravel, > 7 mi) since last review. Demand for ed. is mostly related to hunting, thus adequate. Horse trailers park at check station, no other amenities.
- FWC has added more than seven miles of year round public vehicle access roads to Yucca Pens. tract.

V. Infrastructure/ Management Resources

- Obvious trash should be removed. Shares staff with Webb.
- 7 FTE used in all areas 350-400 tc. 3 OPS ANNUAL.
- Building at Yucca: check station, toilet. Equipment is kept at Webb. Water station equip at Yucca. 7 FTE 3 OPS for Webb & Yucca.

VI. Managed Area Uses

- NRCS study for grazing has been completed.

Management Review Determination

- Presentation and recreation including hunting. Done a nice job of opening up the Yucca to hunting.

5 Soil Series Descriptions

Map Unit Description

Charlotte County, Florida

[Minor map unit components are excluded from this report]

Map unit: 6 - Hallandale fine sand

Component: Hallandale (90%)

The Hallandale component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 7 to 20 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R154XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 9 - EauGallie sand

Component: EauGallie (87%)

The EauGallie component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 5 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 10 - Pompano fine sand

Component: Pompano (87%)

The Pompano component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 11 - Myakka fine sand, 0 to 2 percent slopes

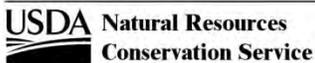
Component: Myakka (90%)

The Myakka component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 12 - Felda fine sand

Component: Felda (90%)

The Felda component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine



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Map Unit Description

Charlotte County, Florida

Map unit: 12 - Felda fine sand

Component: Felda (90%)

terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 13 - Boca fine sand

Component: Boca (85%)

The Boca component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 24 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 14 - Valkaria fine sand

Component: Valkaria (82%)

The Valkaria component makes up 82 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 19 - Gator muck

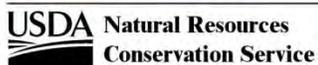
Component: Gator (85%)

The Gator component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over loamy and sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 70 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 20 - Terra Ceia muck

Component: Terra Ceia, drained (85%)

The Terra Ceia, drained component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on marshes on marine terraces on coastal plains. The parent material consists of herbaceous organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May, June, July, August, September, October, November,



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Map Unit Description

Charlotte County, Florida

Map unit: 20 - Terra Ceia muck

Component: Terra Ceia, drained (85%)

December. Organic matter content in the surface horizon is about 75 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 26 - Pineda fine sand, 0 to 2 percent slopes

Component: Pineda (93%)

The Pineda component makes up 93 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 27 - Pompano fine sand, depressional

Component: Pompano (92%)

The Pompano component makes up 92 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7v. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 28 - Immokalee sand, 0 to 2 percent slopes

Component: Immokalee (90%)

The Immokalee component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 33 - Oldsmar sand, 0 to 2 percent slopes

Component: Oldsmar (85%)

The Oldsmar component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map Unit Description

Charlotte County, Florida

Map unit: 34 - Malabar fine sand

Component: Malabar (88%)

The Malabar component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 35 - Wabasso sand, 0 to 2 percent slopes

Component: Wabasso (89%)

The Wabasso component makes up 89 percent of the map unit. Slopes are 0 to 2 percent. This component is on -- Error in Exists On --. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, strongly contrasting textural stratification, is 9 to 50 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 39 - Isles fine sand, depressional

Component: Isles (80%)

The Isles component makes up 80 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 72 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. The soil has a moderately saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 60 within 30 inches of the soil surface.

Map unit: 40 - Anclote sand, depressional

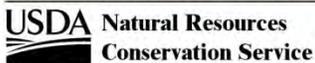
Component: Anclote (88%)

The Anclote component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 6 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 41 - Valkaria fine sand, depressional

Component: Valkaria (93%)

The Valkaria component makes up 93 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water



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Map Unit Description

Charlotte County, Florida

Map unit: 41 - Valkaria fine sand, depressional

Component: Valkaria (93%)

saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 42 - Wabasso sand, limestone substratum

Component: Wabasso, limestone substratum (85%)

The Wabasso, limestone substratum component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 80 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 43 - Smyrna fine sand

Component: Smyrna (85%)

The Smyrna component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 44 - Malabar fine sand, depressional

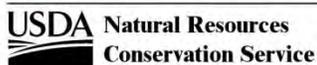
Component: Malabar (88%)

The Malabar component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 45 - Copeland sandy loam, depressional

Component: Copeland (88%)

The Copeland component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, bedrock, lithic, is 20 to 50 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.



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Map Unit Description

Charlotte County, Florida

Map unit: 49 - Felda fine sand, depressional

Component: Felda (86%)

The Felda component makes up 86 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 51 - Floridana sand, depressional

Component: Floridana (88%)

The Floridana component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 8 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 53 - Myakka fine sand, depressional

Component: Myakka (90%)

The Myakka component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 5 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 61 - Orsino fine sand

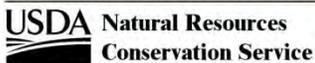
Component: Orsino (90%)

The Orsino component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 62 - Winder sand, depressional

Component: Winder (85%)

The Winder component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal



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Map Unit Description

Charlotte County, Florida

Map unit: 62 - Winder sand, depressional

Component: Winder (85%)

zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 63 - Malabar fine sand, high

Component: Malabar (85%)

The Malabar component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains, flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 69 - Matlacha gravelly fine sand

Component: Matlacha (100%)

The Matlacha component makes up 100 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats, coastal plains. The parent material consists of sandy mine spoil or earthy fill. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 70 - Heights fine sand

Component: Heights (87%)

The Heights component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 72 - Bradenton fine sand

Component: Bradenton (85%)

The Bradenton component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Charlotte County, Florida

Map unit: 73 - Pineda fine sand, depressional

Component: Pineda (88%)

The Pineda component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 74 - Boca fine sand, slough

Component: Boca (85%)

The Boca component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 24 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 78 - Chobee muck

Component: Chobee (90%)

The Chobee component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 35 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 99 - Water

Component: Water (100%)

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

Map Unit Description

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

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

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

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

Map Unit Description

Lee County, Florida

Map unit: 2 - Canaveral fine sand

Component: Canaveral (95%)

The Canaveral component makes up 95 percent of the map unit. Slopes are 0 to 2 percent. This component is on ridges on marine terraces on coastal plains, flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 4 - Canaveral-Urban land complex

Component: Canaveral (60%)

The Canaveral component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on ridges on marine terraces on coastal plains, flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Urban land (30%)

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

Map unit: 5 - Captiva fine sand

Component: Captiva (92%)

The Captiva component makes up 92 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 4 percent. This component is in the R155X011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent. The soil has a slightly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 15 within 30 inches of the soil surface.

Map unit: 6 - Hallandale fine sand

Component: Hallandale (90%)

The Hallandale component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 7 to 20 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R154X003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Lee County, Florida

Map unit: 7 - Matlacha-Urban land complex

Component: Matlacha (55%)

The Matlacha component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats, coastal plains. The parent material consists of sandy mine spoil or earthy fill. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Urban land (45%)

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

Map unit: 8 - Hallandale fine sand, tidal

Component: Hallandale, tidal (90%)

The Hallandale, tidal component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on tidal marshes on marine terraces on coastal plains. The parent material consists of sandy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 7 to 20 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is very frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY009FL Salt Marsh ecological site. Nonirrigated land capability classification is 8. This soil meets hydric criteria. The soil has a strongly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 50 within 30 inches of the soil surface.

Map unit: 9 - EauGallie sand

Component: EauGallie (87%)

The EauGallie component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 5 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 10 - Pompano fine sand

Component: Pompano (87%)

The Pompano component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Lee County, Florida

Map unit: 11 - Myakka fine sand, 0 to 2 percent slopes

Component: Myakka (90%)

The Myakka component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 12 - Felda fine sand

Component: Felda (90%)

The Felda component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 13 - Boca fine sand

Component: Boca (85%)

The Boca component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 24 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 14 - Valkaria fine sand

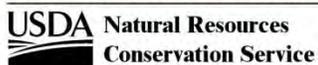
Component: Valkaria (82%)

The Valkaria component makes up 82 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 15 - Estero muck

Component: Estero, tidal (96%)

The Estero, tidal component makes up 96 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is very frequently flooded. It is not ponded. A seasonal zone of



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Map Unit Description

Lee County, Florida

Map unit: 15 - Estero muck

Component: Estero, tidal (96%)

water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 46 percent. This component is in the R155XY009FL Salt Marsh ecological site. Nonirrigated land capability classification is 8. This soil meets hydric criteria. The soil has a strongly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 60 within 30 inches of the soil surface.

Map unit: 16 - Peckish mucky fine sand

Component: Peckish, tidal (88%)

The Peckish, tidal component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is very frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 10 percent. Nonirrigated land capability classification is 8. This soil meets hydric criteria. The soil has a strongly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 65 within 30 inches of the soil surface.

Map unit: 17 - Daytona sand

Component: Daytona (92%)

The Daytona component makes up 92 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 51 inches during July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 18 - Matlacha gravelly fine sand, limestone substratum

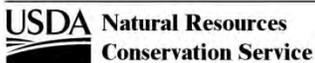
Component: Matlacha (83%)

The Matlacha component makes up 83 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats, coastal plains. The parent material consists of sandy mine spoil or earthy fill. Depth to a root restrictive layer, bedrock, lithic, is 40 to 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 19 - Gator muck

Component: Gator (85%)

The Gator component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over loamy and sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 70 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.



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Map Unit Description

Lee County, Florida

Map unit: 20 - Terra Ceia muck

Component: Terra Ceia, drained (85%)

The Terra Ceia, drained component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on marshes on marine terraces on coastal plains. The parent material consists of herbaceous organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 75 percent. This component is in the R155X010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 22 - Beaches

Component: Beaches (95%)

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

Map unit: 23 - Wulfert muck

Component: Wulfert, tidal (90%)

The Wulfert, tidal component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes on marine terraces on coastal plains. The parent material consists of organic material over sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is very frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 75 percent. This component is in the R155X009FL Salt Marsh ecological site. Nonirrigated land capability classification is 8. This soil meets hydric criteria. The soil has a strongly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 60 within 30 inches of the soil surface.

Map unit: 24 - Kesson fine sand

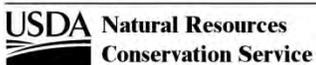
Component: Kesson, tidal (88%)

The Kesson, tidal component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes on marine terraces on coastal plains. The parent material consists of sandy marine deposits with shells. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is very frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 8. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent. The soil has a strongly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 20 within 30 inches of the soil surface.

Map unit: 25 - St. Augustine, organic substratum-Urban land complex

Component: St. Augustine (55%)

The St. Augustine component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy mine spoil or earthy fill. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 23 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.



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Map Unit Description

Lee County, Florida

Map unit: 25 - St. Augustine, organic substratum-Urban land complex

Component: Urban land (35%)

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

Map unit: 26 - Pineda fine sand, 0 to 2 percent slopes

Component: Pineda (93%)

The Pineda component makes up 93 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 27 - Pompano fine sand, depressional

Component: Pompano (92%)

The Pompano component makes up 92 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 28 - Immokalee sand, 0 to 2 percent slopes

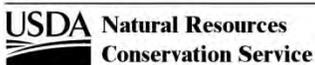
Component: Immokalee (90%)

The Immokalee component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 29 - Punta fine sand

Component: Punta (94%)

The Punta component makes up 94 percent of the map unit. Slopes are 1 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.



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Map Unit Description

Lee County, Florida

Map unit: 33 - Oldsmar sand, 0 to 2 percent slopes

Component: Oldsmar (85%)

The Oldsmar component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 34 - Malabar fine sand

Component: Malabar (88%)

The Malabar component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 35 - Wabasso sand, 0 to 2 percent slopes

Component: Wabasso (89%)

The Wabasso component makes up 89 percent of the map unit. Slopes are 0 to 2 percent. This component is on -- Error in Exists On --, The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, strongly contrasting textural stratification, is 9 to 50 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 36 - Immokalee-Urban land complex

Component: Immokalee (60%)

The Immokalee component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Urban land (30%)

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

Map Unit Description

Lee County, Florida

Map unit: 37 - Satellite fine sand

Component: Satellite (90%)

The Satellite component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 38 - Isles fine sand, slough

Component: Isles (83%)

The Isles component makes up 83 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 72 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. The soil has a moderately saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 60 within 30 inches of the soil surface.

Map unit: 39 - Isles fine sand, depressional

Component: Isles (80%)

The Isles component makes up 80 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 72 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. The soil has a moderately saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 60 within 30 inches of the soil surface.

Map unit: 40 - Anclote sand, depressional

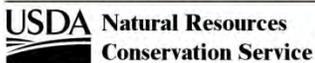
Component: Anclote (88%)

The Anclote component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 6 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 41 - Valkaria fine sand, depressional

Component: Valkaria (93%)

The Valkaria component makes up 93 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water



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Map Unit Description

Lee County, Florida

Map unit: 41 - Valkaria fine sand, depressional

Component: Valkaria (93%)

saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 42 - Wabasso sand, limestone substratum

Component: Wabasso, limestone substratum (85%)

The Wabasso, limestone substratum component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 80 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 43 - Smyrna fine sand

Component: Smyrna (85%)

The Smyrna component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 44 - Malabar fine sand, depressional

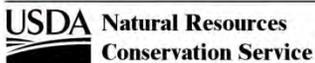
Component: Malabar (88%)

The Malabar component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 45 - Copeland sandy loam, depressional

Component: Copeland (88%)

The Copeland component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, bedrock, lithic, is 20 to 50 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.



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Map Unit Description

Lee County, Florida

Map unit: 48 - St. Augustine sand

Component: St. Augustine (95%)

The St. Augustine component makes up 95 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy mine spoil or earthy fill. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 23 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 49 - Felda fine sand, depressional

Component: Felda (86%)

The Felda component makes up 86 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 50 - Oldsmar fine sand, limestone substratum

Component: Oldsmar, limestone substratum (88%)

The Oldsmar, limestone substratum component makes up 88 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 60 to 72 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 51 - Floridana sand, depressional

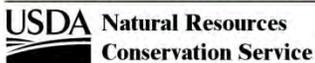
Component: Floridana (88%)

The Floridana component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 8 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 53 - Myakka fine sand, depressional

Component: Myakka (90%)

The Myakka component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the



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Map Unit Description

Lee County, Florida

Map unit: 53 - Myakka fine sand, depressional

Component: Myakka (90%)

surface horizon is about 5 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 55 - Cocoa fine sand

Component: Cocoa (85%)

The Cocoa component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY002FL Longleaf Pine-turkey Oak Hills ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 56 - Isles muck

Component: Isles, tidal (85%)

The Isles, tidal component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes on marine terraces on coastal plains. The parent material consists of loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 42 to 72 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is very frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 35 percent. This component is in the R155XY009FL Salt Marsh ecological site. Nonirrigated land capability classification is 8. This soil meets hydric criteria. The soil has a strongly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 60 within 30 inches of the soil surface.

Map unit: 57 - Boca fine sand, tidal

Component: Boca, tidal (85%)

The Boca, tidal component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 24 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is very frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY009FL Salt Marsh ecological site. Nonirrigated land capability classification is 8. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. The soil has a moderately saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 11 within 30 inches of the soil surface.

Map unit: 59 - Urban land

Component: Urban land (90%)

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

Map Unit Description

Lee County, Florida

Map unit: 61 - Orsino fine sand

Component: Orsino (90%)

The Orsino component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY001FL Sand Pine Scrub ecological site. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 62 - Winder sand, depression

Component: Winder (85%)

The Winder component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 63 - Malabar fine sand, high

Component: Malabar (85%)

The Malabar component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains, flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 64 - Hallandale-Urban land complex

Component: Hallandale (60%)

The Hallandale component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 7 to 20 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Urban land (30%)

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

Map Unit Description

Lee County, Florida

Map unit: 66 - Caloosa fine sand

Component: Caloosa (85%)

The Caloosa component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on dredge spoil banks on marine terraces on coastal plains. The parent material consists of sandy and clayey dredge spoils. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 36 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 67 - Smyrna-Urban land complex

Component: Smyrna (60%)

The Smyrna component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Urban land (35%)

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

Map unit: 69 - Matlacha gravelly fine sand

Component: Matlacha (100%)

The Matlacha component makes up 100 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats, coastal plains. The parent material consists of sandy mine spoil or earthy fill. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 70 - Heights fine sand

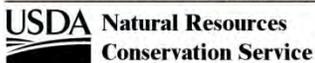
Component: Heights (87%)

The Heights component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 72 - Bradenton fine sand

Component: Bradenton (85%)

The Bradenton component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater



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Map Unit Description

Lee County, Florida

Map unit: 72 - Bradenton fine sand

Component: Bradenton (85%)

than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September. Organic matter content in the surface horizon is about 4 percent. This component is in the R155XY012FL Wetland Hardwood Hammock ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 73 - Pineda fine sand, depressional

Component: Pineda (88%)

The Pineda component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the R155XY010FL Freshwater Marshes And Ponds ecological site. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 74 - Boca fine sand, slough

Component: Boca (85%)

The Boca component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 24 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 75 - Hallandale fine sand, slough

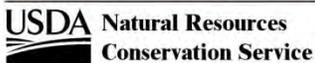
Component: Hallandale (88%)

The Hallandale component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 2 to 20 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 76 - Electra fine sand

Component: Electra (83%)

The Electra component makes up 83 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY003FL South Florida Flatwoods ecological site. Nonirrigated land capability classification is 6s.



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Map Unit Description

Lee County, Florida

Map unit: 76 - Electra fine sand

Component: Electra (83%)

This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 77 - Pineda fine sand, limestone substratum

Component: Pineda (88%)

The Pineda component makes up 88 percent of the map unit. Slopes are 0 to 1 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 80 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. This component is in the R155XY011FL Slough ecological site. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 99 - Water

Component: Water (100%)

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

Map unit: 100 - Waters of the Gulf of Mexico

Component: Water of the Gulf of Mexico (100%)

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

6 FNAI Data Usage Letter



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April 11, 2014

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

Dear David,

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

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

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

Sincerely,

Gary Knight
Director
Florida Natural Areas Inventory



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

Tracking Florida's Biodiversity

7 BWWMA WCPR Strategy

Babcock-Webb Wildlife Management Area Species Management Strategy

March 2014

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

A product of the Wildlife Conservation
Prioritization and Recovery Program



Executive Summary

The Florida Fish and Wildlife Conservation Commission's (FWC) Wildlife and Habitat Management Section (WHM) takes a proactive, science-based approach to species management on lands in the Wildlife Management Area system (WMA/WEA). This approach uses information from statewide models, in conjunction with input from species experts and people knowledgeable about the area, to create site-specific assessments of a number of focal species. Staff combines these assessments with management considerations to develop a wildlife management strategy for the area. The FWC intends for this Strategy to: 1) Provide land managers with information on actions that should be taken provided the necessary resources are available, 2) Promote the presence and ensure the persistence of focal wildlife species on the area, and 3) Provide measurable species objectives that can be used to evaluate the success of wildlife management on the area.

This document presents the results of a science-based process for evaluating focal species needs using an ecosystem management approach on the Fred C. Babcock/Cecil M. Webb Wildlife Management Area (BWWMA). Natural community management designed for a set of focal species benefits a host of species reliant upon the same natural communities. Monitoring select species verifies whether natural community management is having the desired effect on wildlife. To maximize the potential wildlife conservation benefit, staff considers the role of the WMA in regional and statewide conservation initiatives throughout the process.

[Section 1](#) informs the reader about the process used to generate this document.

[Section 2](#) describes the historic and ongoing management actions on the properties.

[Section 3](#) provides a list of the focal and listed species on the area, and an assessment of each species' level of opportunity and need. This includes species-specific objectives for the red-cockaded woodpecker, the Florida bonneted bat, and the Florida panther.

[Section 4](#) describes specific land management actions recommended for focal species. This includes Strategic Management Areas (SMA) and Objective-Based Vegetation Management (OBVM) considerations. This section also discusses management necessary to ensure continued persistence of focal species.

[Section 5](#) describes species-specific management and monitoring actions prescribed for the area, and identifies any research that would be necessary to guide future management efforts. Species management at BWWMA includes maintenance of bat houses for multiple species, planting of food plots for northern bobwhite, and various actions for the red-cockaded woodpecker. Monitoring is recommended for the Florida bonneted bat, northern bobwhite, and red-cockaded woodpecker. Documentation of opportunistic observations of other focal and listed species is also recommended.

[Section 6](#) identifies coordination that will assist in conserving these focal species. We identify coordination with 8 other units in FWC and inter-agency coordination with 16 other entities.

[Section 7](#) describes efforts that should occur "beyond the area's boundaries" to ensure conservation of the species on the area.

Continuation of resources at current levels would be required to provide for most of the land management recommended in this document. Some of the monitoring recommendations may require additional resources, while FWC can accomplish others with continuation of existing resources.

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Acronym List

AHREs	Aquatic Habitat Restoration and Enhancement Subsection
ARCI	Avian Research and Conservation Institute
BMU	Bear Management Unit
BRP	Babcock Ranch Preserve
BWWMA	Babcock-Webb Wildlife Management Area
CARL	Conservation and Recovery Lands (program)
CHFI	Charlotte Harbor Flatwoods Initiative
CPS	Conservation Planning Services (office)
DFC(s)	Desired Future Condition(s)
HGM	Hunting and Game Management (division)
FBC	Florida Bat Conservancy
FFS	Florida Forest Service (formerly Division of Forestry)
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
FWLI	Florida Wildlife Legacy Initiative
FWRI	Fish and Wildlife Research Institute
FGFFC	Florida Game and Fresh Water Fish Commission (predecessor to the FWC)
GSM	Game Species Management
HCWEA	Hickey's Creek Mitigation Park Wildlife and Environmental Area
IPM	Invasive Plant Management
MU(s)	Management Unit(s)
OBVM	Objective Based Vegetation Management
PLCP	Public Lands Conservation Planning (project)
PBG	Potential Breeding Group
PHA	Public Hunting Area
PVA	Population Viability Analysis
RCWMAG	Red-Cockaded Woodpecker Management Advisory Group
SCP	Species Conservation Planning (section)
SFWMD	South Florida Water Management District
SGCN	Species of Greatest Conservation Need
SHCA	Strategic Habitat Conservation Area
SMA	Strategic Management Area
SFWMD	Southwest Florida Water Management District
SWG	State Wildlife Grant
TIITF	Board of Trustees of the Internal Improvement Trust Fund
TTRS	Tall Timbers Research Station
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WCPR	Wildlife Conservation Prioritization and Recovery (program)
WEA	Wildlife and Environmental Area
WHCniFL	Wildlife Habitat Conservation Needs in Florida (document)
WHM	Wildlife and Habitat Management (section)
WMA	Wildlife Management Area

Statewide Species Prioritization Parameters

This table provides the values for the 6 prioritization parameters for the focal species. Parameters that are “triggered” (exceed the threshold) are in **bold**. Typically, the more parameters a species triggers, the higher the statewide prioritization.

Species Common Name	Millsap et al ¹		State Wildlife Action Plan ²		PVA on managed lands	
	Biological Score ³	Supplemental Score ⁴	Population Status ⁵	Population Trends ⁶	Probability of a 50% decline ⁷	Populations persisting (to 80 or 100 years) ⁸
Gopher Frog	24.6	12	medium	declining	0	9% (to 80)
Florida Pine Snake	23.7	15	medium	declining	0	31% (to 80)
Gopher Tortoise	27.3	17	medium	declining	0	55% (to 100)
American Swallow-Tailed Kite	25.7	13	low	unknown	20%	50% (to 100)
Bachman's Sparrow	16.0	12	medium	declining	0	49% (to 80)
Brown-Headed Nuthatch	17.0	13	medium	declining	0	25% (to 80)
Burrowing Owl	15.3	15	medium	unknown	>90%	6% (to 100)
Cooper's Hawk	15.0	12	not a SGCN ⁹	not a SGCN ⁹	96%	100% (to 100)
Crested Caracara	37.7	17	low	unknown	0	100% (to 100)
Florida Grasshopper Sparrow	39.7	18	low	declining	100%	12% (to 100)
Florida Mottled Duck	17.3	18	medium	declining	1%	100% (to 100)
Florida Sandhill Crane	27.0	16	medium	declining	0	33 % (to 80)
Florida Scrub-Jay	36.6	19	low	declining	30%	2% (to 80)
Limpkin	24.3	14	medium	unknown	0	100% (to 100)
Northern Bobwhite	11.0	14	low	declining	0	100% (to 100)
Red-Cockaded Woodpecker	27.6	14	low	declining	0	45% (to 100)
Southeastern American Kestrel	28.0	14	low	declining	0	67% (to 100)
Southern Bald Eagle	21.3	10	medium	increasing	0	100% (to 100)

Species Common Name	Millsap et al ¹		State Wildlife Action Plan ²		PVA on managed lands	
	Biological Score ³	Supplemental Score ⁴	Population Status ⁵	Population Trends ⁶	Probability of a 50% decline ⁷	Populations persisting (to 80 or 100 years) ⁸
Wading Birds	variable	variable	variable	variable	0	100% (to 100)
Florida Black Bear	32.7	13	medium	stable	5%	100% to (100)
Florida Bonneted Bat	33.3	18	low	unknown	NA	NA
Florida Panther	40.3	15	low	unknown	0	100% (to 100)
Sherman's Fox Squirrel	24.0	17	low	declining	0	28% (to 80)

¹ scores derived from Millsap et al (1990), "Setting priorities for the conservation of fish and wildlife species in Florida", as updated by staff of the FWC. We used the most recent updates to score.

² [Florida's State Wildlife Action Plan](#).

³ Species trigger this parameter if the score is ≥ 25 .

⁴ Species trigger this parameter if the score is ≥ 15

⁵ Species trigger this parameter if the score is low or unknown

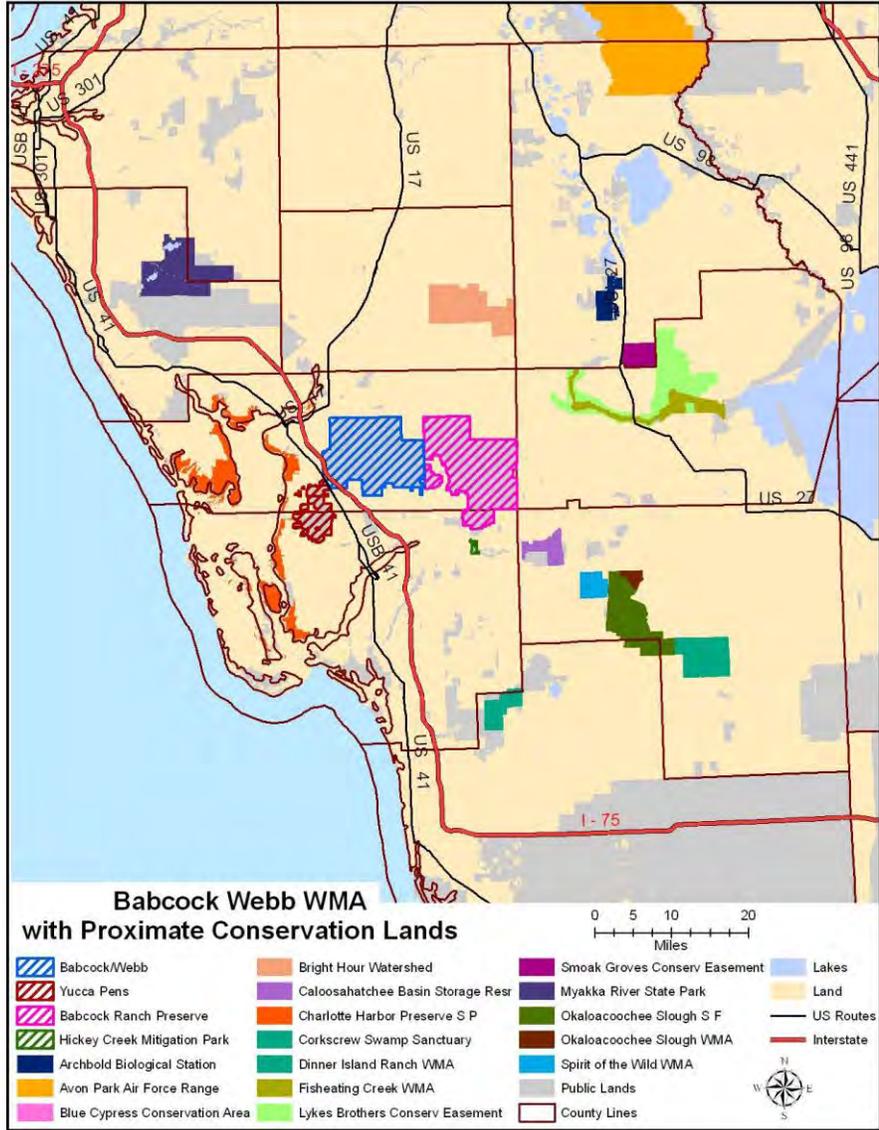
⁶ Species trigger this parameter if the score is declining or unknown

⁷ Species trigger this parameter if the score is > 0

⁸ Species trigger this parameter if the score is $\leq 75\%$

⁹ SGCN = species of greatest conservation need

Locator Map



Section 1: Introduction

The FWC manages the lands in the Wildlife Management Area system using a proactive approach, which includes an understanding of natural communities of plants and animals. As applied by FWC, natural community management starts by classifying lands into distinct natural communities that we then manage in a way to maintain or enhance the communities' unique structure and function. Land management that has a positive influence on natural community conditions benefits the wildlife living in these habitats.

Another important aspect of FWC's management approach is ensuring that it is science-informed and meets the needs of Florida's wildlife. The agency's Wildlife Conservation Prioritization and Recovery Program (WCPR) created this Species Management Strategy for BWWMA to inform and guide management on the areas, and to verify that area management is meeting the needs of wildlife. The FWC intends for this Strategy to: 1) Provide land managers with information on management actions that should be taken provided the necessary resources are available; 2) Promote the presence and facilitate the persistence of wildlife species on the area; and 3) Provide measurable objectives that can be used to evaluate the success of wildlife management on the area.

When developing a Strategy, WCPR staff uses multiple tools to analyze and evaluate an area's opportunities to manage for wildlife. The focal species concept is an approach to identify the needs of wildlife collectively by strategically focusing on a subset of wildlife species. The subset of species FWC selected as focal species includes umbrella species, keystone species, habitat-specialist species, and indicator species. [Objective Based Vegetation Management](#) (OBVM) is a method used to assess if vegetation management within natural communities is achieving the desired conditions. Also, [Strategic Management Area](#) (SMA) is a specially designated piece of land where additional management actions are required to address a particular need.

In addition to tools discussed above, WCPR staff uses specific definitions in a Strategy. *Goals* are broad statements of a condition or accomplishment to be achieved. Goals may be unattainable, but provide direction and inspiration. *Objectives* are a measurable, time-specific statement of results responding to pre-established goals. *Imperiled Species* refers to any plant or animal federally listed under the Endangered Species Act or state-listed by the Florida Fish and Wildlife Conservation Commission or the Department of Agriculture and Consumer Services.

Creating the BWWMA Strategy involved a number of steps. First, WCPR staff assessed the results of species-specific habitat models and statewide potential habitat maps for focal species to determine which focal species had potential habitat on BWWMA. WCPR staff then used knowledge from FWC staff, species-expert opinions, and area-specific natural community maps to modify the statewide models and create area-specific potential habitat maps for each focal species. Next, WCPR staff conducted a workshop at which area managers, species experts, and section leaders discussed and evaluated BWWMA's potential

roles in the conservation of focal species. For each species, workshop participants determined the status of the species on the areas; evaluated the opportunities for management on the areas; specified appropriate monitoring and research actions; and identified beneficial coordination and ‘beyond the boundary’ considerations. Using the information from the workshop, staff drafted the Strategy document and sent it to species experts and other professionals for review. Following the review, the Strategy was finalized and staff initiated implementation of actions in the Strategy.

FWC staff considered the goals and objectives in BWWMA’s Management Plan (formerly known as Conceptual Management Plan) when discussing and assessing the species; therefore, this Strategy supports the goals of the Management Plan. Management plans are on a 10-year revision cycle. During the next revision of the Management Plan, staff will incorporate the objectives in this Strategy into the Management Plan, and append this Strategy to the revised Management Plan.

While this Strategy focuses on BWWMA, it considers the role of each area within the larger state or regional context. Similarly, while the Strategy has species-specific objectives and actions, it does not endorse single-species management. Natural community management is the core of FWC’s ecological management approach, and by paying special attention to the needs of focal and imperiled species, we verify that management actions are having the desired effect. By implementing the actions in the Strategy, the FWC believes that management will keep common species common, aid in the recovery of listed species, and benefit the largest suite of native wildlife.

Section 2: Current and Historic Management on Babcock-Webb Wildlife Management Area

2.1: Location, Acquisition, and Influences on Current Condition

The Fred C. Babcock/Cecil M. Webb Wildlife Management Area (BWWMA) is located in Charlotte and Lee Counties and consists of the Webb tract (65,758 acres) and the Yucca Pens Unit (14,577 acres). The FWC holds the title for the Webb tract and the Board of Trustees of the Internal Improvement Trust Fund (TIITF) owns the Yucca Pens Unit. For the purpose of this Strategy, BWWMA refers to both the Webb and the Yucca Pens tracts. When a tract is referred to by name, the discussion applies only to that tract. Though Webb and the Yucca Pens Unit were purchased separately, they are located in close proximity to one another. U.S. 41 separates the Webb tract on the east from the Yucca Pens Unit on the west, as Interstate 75 crosses on the far southwestern corner of the Webb tract ([Locator Map](#)). The proximity to U.S. 41 and Interstate 75 requires consideration during prescribed fire activities. These major roadways also create a potential impediment to wildlife movement between Webb and the Yucca Pens Unit.

In 1941, the Florida Game and Freshwater Fish Commission (FGFFC, predecessor to the FWC) initiated purchase of BWWMA using funds made available by the U.S. Fish and Wildlife Services (USFWS) via the Pittman-Robertson Act. Except for 20 acres purchased using funds from the Conservation and Recreational Lands (CARL) program, all of the acreage acquired for the Webb tract of the BWWMA was purchased using Pittman-Robertson funds. The State of Florida purchased the initial 3,600 acres of the Yucca Pens Unit in 1995 using CARL funds as part of the [Charlotte Harbor Flatwoods Florida Forever Project](#). One of the goals of management for this project was "... to conserve and protect significant habitat for native species or endangered and threatened species...". Utilizing both CARL and Preservation 2000 resources, the TITF authorized additional land purchases varying in size that totaled to 10,977 acres, contributing to the creation of the Yucca Pens Unit.

BWWMA is part of a network of conservation lands that runs from the Charlotte Harbor Preserve on the western edge and continues northeast to Fisheating Creek ([Locator Map](#)). Many species on BWWMA also occur on Babcock Ranch Preserve (BRP); the 73,239-acre preserve just to the east of BWWMA across State Road 31. With nearly 55,335 acres of diverse natural habitats, BRP helps support populations that persist on BWWMA and is considered when assessing potential habitat for focal species in this Strategy. BRP is owned by the State and is cooperatively managed by Babcock Ranch, Inc.; Babcock Ranch Management, LLC; the FWC; the Florida Forest Service (FFS); and Lee County (on the Lee County portion). Upon expiration of the BRP management agreement in July 2016, FFS will assume management responsibilities as lead managing agency and FWC will function as a cooperating agency.

Although BWWMA is outside their primary and secondary range, Florida black bears and Florida panthers dispersing through the area are prone to vehicle collisions along major roads. The Florida Department of Transportation's plans to widen State Road 31 from 2 lanes to 4 lanes prompted FWC to propose 2 wildlife underpasses to alleviate vehicle collisions for wildlife moving between BWWMA and BRP. To accommodate Florida black bear and Florida panther movement, FWC recommended installing one underpass approximately 4,000 feet north of where Tucker's Grade crosses State Road 31 and the other approximately 3,000 feet to the south of where Tucker's Grade crosses State Road 31.

Hickey's Creek Wildlife and Environmental Area (HCWEA) is an FWC gopher tortoise mitigation park managed in cooperation with Lee County Department of Parks and Recreation. HCWEA is located approximately 10 miles southeast of BWWMA and was included in potential habitat models for many focal species. With the addition of several privately-owned tracts acquired through a conservation easement program, the network of conservation lands around BWWMA continues to expand and extend linkages.

History

In the 1920s, prior to State acquisition, several timber companies clear-cut pine trees on what is now BWWMA. By the 1930s, cull trees and a few small pines were all that remained. There were no active reforestation efforts at that time and most of the trees present on BWWMA today are descendants of the cull trees that were not harvested. The natural reforestation process has left large areas with few pine trees, and due to minor elevation changes on BWWMA, trees are located on ridges between shallow ponds, wet flatwoods, and dry and wet prairies. Pine resources on Webb also were used for turpentine production, and in the early 1970s, the FGFFC issued a 10-year lighter pine stumpage contract to the Hercules Company. In 1985, area staff initiated pine planting in minimally-stocked areas that met the historic conditions for pines. As of 2013, approximately 1,200 acres of planted pines have been established on BWWMA, mostly in plantations 40-60 acres in size.

Cattle grazing has been ongoing at BWWMA since before state acquisition. Cattlemen have historically used frequent fire on BWWMA to reduce fuels and increase pasture productivity in grazing lands. The initial cattle leases were leased by the acre and the cattlemen determined the stocking rates. In 1977, the FWC decided to officially cap stocking rates at 50% of the recommended rates determined by the National Resource Conservation Service. According to the 2012 National Resource Conservation Service Prescribed Grazing Plan, Webb contains approximately 19,145 acres in continuous grazing and 9,908 acres in rotational grazing with the ability to support 1,014 animal units. The Yucca Pens Unit contains approximately 14,674 acres of potential grazed land and can support up to 207 animal units. Current cattle lessees are required to maintain all perimeter fences and disk all fire lines within their lease annually. Prior to release on BWWMA, lessees quarantine cattle for 7 days in an off-site location to reduce the spread of exotic plants such as tropical soda apple (*Solanum viarum*). Cattle leases benefit FWC operations at BWWMA by increasing annual revenue, reducing vegetative fuels through grazing, and reducing the time and money that area staff has to spend on fence and fire line maintenance.

Hydrology

Hydrology is a major issue on BWWMA, as rains typically inundate much of the area during the June-October wet season. Prolonged inundation can reduce habitat suitability for burrowing species in historically dry areas. Rain and associated seasonal flooding can also have an effect on land management activities by influencing timing of burns and the use of heavy equipment. Seasonal flooding can provide some wetland species with temporary habitat during the wet season, but historically dry habitat may not be in suitable condition for these species to nest and forage.

Hydrologic changes over the past century have contributed to disrupted water flow on and surrounding BWWMA. The original flow of the Gator Slough watershed moved water from Webb through the Yucca Pens Unit and southwest toward Matlache Pass and Charlotte

Harbor. In 1957, the creation of the Gator Slough Canal caused excessive drainage on the Yucca Pens Unit by diverting water to the city of Cape Coral. The construction of Interstate 75 in 1978 also inhibited drainage on Webb, causing water to back-up on the tract.

A hydrological study done in 1982 documented the Webb tract's water flow issues. The study recommended installation of low water fords and riser structures to help slow the flow and hold water in order to reduce flooding downstream. Unfortunately, further land modifications and development around Webb overwhelmed the original structures, and in 2011 and 2012, these structures were replaced. From 2009 through 2010, the South Florida Water Management District (SFWMD) funded and executed a hydrological study and flow-way model for the Yucca Pens Unit. This study determined that free flowing culvert pipes were draining the water from the Yucca Pens Unit through the Gator Slough Canal and that additional water from Webb was needed to hydrate the Yucca Pens Unit. SFWMD has initiated plans to install a series of ditch blocks to correct the free-flowing culverts in the 2012-2013 fiscal year and will continue installation in 2014.

In 2010, the Charlotte Harbor Flatwoods Initiative (CHFII) was formed to take a regional approach in addressing issues with the Gator Slough watershed. This group includes representatives of state agencies, county governments, federal agencies, and private interests. The CHFII looked at the current water flow issues to the southwest of BWWMA and other water flow alternatives to move water from Webb back across the Yucca Pens Unit. The ongoing Interstate 75 lane expansion project that began in late 2013 presented a chance for the group to consider modification of the Interstate 75 drainage and flow ways. Currently, the CHFII is optimistic there will be at least some hydrological improvement for areas encompassing BWWMA, although plans have yet to be finalized.

2.2: Management Since Acquisition

The Florida Natural Areas Inventory (FNAI) completed plant community mapping at BWWMA as part of FWC's OBVM program ([Table 1](#)); however, historic plant community mapping was not completed. Some historic information showing pine densities and locations of the late 1970's stumpage efforts is available from old aerial photos. Through the OBVM workshop process, staff delineated management units (MUs) and defined the desired future conditions (DFCs) for the actively managed natural communities. In 2011, the MU's were redrawn to accommodate the new prescribed fire system which was developed as part of a northern bobwhite (*Colinus virginianus*) project. In 2014, FNAI plans to remap portions of BWWMA using historic plant community data to identified areas that were mistakenly classified in previous surveys. The actively managed natural communities on BWWMA encompass 81,183 acres in MUs on BWWMA, which includes 60,929 acres of mesic flatwood, wet flatwood, dry prairie and wet prairie communities.

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

Community Type	Estimated current acreage – Webb	Estimated current acreage – Yucca Pens	# of focal species that use the NC
Basin Marsh	11,572	707	9
Basin Swamp	0	423	9
Depression Marsh	2,931	524	7
Dome Swamp	0	29.4	5
Dry Prairie ¹	9,965	38	11
Hydric Hammock	5	0	6
Mesic Flatwoods ¹	29,010	7,786	18
Mesic Hammock	138	29	6
Pasture – Improved	36	0	15
Pasture – Semi-improved	227	0	15
Pine Plantation	111	0	9
Ruderal	3,078	445	15
Wet Flatwoods ¹	6,873	4,063	9
Wet Prairie ¹	3,046	148	6
TOTAL ACRES ²	66,991	14,192	

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

² The total acres identified in the lease differs from the total acres identified during the mapping effort. This is possibly due to a combination of digitizing error and complications in determining actual boundaries.

Prescribed fire is the primary land management activity on BWWMA. During the early years of FWC management, staff ignited fires and allowed them to burn across the landscape without containment by fire lines, which is similar to how wildfires historically occurred in Florida. Increasing development around BWWMA necessitated the establishment of burn units. In the 1980s, staff initiated burn unit delineation and the creation of fire lines. Currently, Webb has approximately 540 miles of fire lines. The cattle lessees disk 75% of these lines (402 miles) but the remaining 138 miles on Webb and 105 miles in the Yucca Pens Unit are maintained by staff. The current fire line system allows managers to control both the fire and smoke on a smaller scale than the historic methods.

Fire management on BWWMA has gone through several stages since the fire lines were established. The original fire rotation on Webb consisted of alternating blocks on a 2-

year cycle. In 1996, staff changed the fire rotation for most of BWWMA to an annual burn rotation with all fires occurring in the winter. This fire cycle kept a majority of the area within the rotation interval, but due to low fuel levels, some unburned areas remained in the blocks and provided wildlife cover. A high intensity management area on Webb, known as the field trial area, was put into an annual prescribed burn cycle for the purposes of northern bobwhite research. In early 2010 the FWC, in conjunction with Tall Timbers Research Station (TTRS), established 3 burn treatments on the field trial area to evaluate the response of the northern bobwhite population to different burn approaches. These treatments consist of strip-type fires, large blocks (3,000-4,000 acres), and smaller, alternating blocks burned in a checkerboard pattern. See [Section 3.2.13](#) for more information about northern bobwhite research and monitoring on BWWMA.

By 1998, the Yucca Pens Unit contained established fire lines and staff initiated a fire management program largely relying on dormant-season burns to reduce fuel loads. Summer burns were initiated in 2003 and by 2006, approximately 4,000 acres had been burned during the growing season. Due to unfavorable weather conditions from 2006-2009, prescribed fires were rarely conducted on the Yucca Pens Unit. By 2010, the staff commitment necessary to implement the new prescribed fire plan on Webb reduced the available staff to burn on the Yucca Pens Unit, effectively placing the Yucca Pens Unit out of rotation.

In addition to prescribed fire, staff apply mechanical vegetation treatment (roller-chopping, shredding, mowing) as a land management activity on BWWMA. Saw palmetto (*Serenoa repens*) historically occurred as a low-growing and scattered component throughout the flatwoods, with larger and thicker patches on the leeward side of ponds and other fire obstacles. Over time, palmetto gradually increased in abundance and stature, thereby reducing the diversity of flatwoods plant communities. In 1982, roller-chopping was initiated to reduce palmetto coverage.

In 2004 and 2005, roller-chopping efforts were supplemented with shredding, but shredding was abandoned due to equipment down time and increased palmetto re-sprouting in treated areas. Mowing is currently being used to supplement roller-chopping of palmetto in red-cockaded woodpecker (*Picoides borealis*) clusters. Roller-chopping activities were historically conducted during the dry season; however, in 2005, roller-chopping was moved from winter to summer, resulting in better palmetto reduction and overall health of the desirable plants. In 2006, Global Positioning Systems units on equipment were used to track where contractors roller-chopped, rather than just identifying the MUs where treatment occurred. Since 1988, staff have applied roller-chopping to 33,110 acres, with roughly half of these treatments (17,261 acres) chopped between 2008 and 2011. The roller-chopping program has both reduced palmetto coverage and increased plant diversity and abundance.

Area staff intensively manages exotic plant species on BWWMA. The exotic plant control program on Webb began in 1984 with melaleuca (*Melaleuca quinquenervia*) and Brazilian pepper (*Schinus terebinthifolius*) being the primary targets. By 1993, most of the melaleuca on Webb had received initial treatment and was responding favorably. At

acquisition, the Yucca Pens Unit contained a large amount of melaleuca, Brazilian pepper, and downy rose myrtle (*Rhodomyrtus tomentosa*). Through the use of intensive management and aerial treatments, there has been a 70-80% reduction in the amount of these exotics on the Yucca Pens Unit.

The current list of exotics on BWWMA includes: melaleuca, Brazilian pepper, downy rose myrtle, tropical soda apple, cogongrass (*Imperata cylindrica*), old and new world Japanese climbing fern (*Lygodium microphyllum* and *L. japonicum*), balsam apple (*Momordica charantia*), ear-leaf acacia (*Acacia auriculiformis*), silk reed (*Neyraudia reynaudiana*), lead tree (*Leucaena leucocephala*), natal grass (*Rhynchelytrum repens* syn. *Melinis repens*), west Indian marsh grass (*Hymenachne amplexicaulis*), and rosary pea (*Abrus precatorius*). FWC staff conducts the majority of exotics treatments on BWWMA.

Recreational activities on BWWMA include hiking, horseback riding, hunting, fishing, camping, and wildlife viewing. Amenities include parking and camping facilities on Webb, as well as a public shooting range. Additionally, 1,280 acres of the Webb unit has been leased to the Boy Scouts of America for a scout camp.

Monitoring

Past vegetative surveys have examined the effects of cattle grazing and roller-chopping on natural community structure. In 1982, a vegetative survey began comparing rotational grazing to continuous grazing annually for 10 years. The rotational grazing portion was discontinued after significant rains during the second year of the project and showed no significant change in diversity or forage amount. The University of Florida conducted a follow-up vegetative study to determine seasonal effects of roller-chopping. This study showed that winter chopping resulted in a 40-55% reduction of palmetto coverage while summer chopping produced an 80-90% reduction. In 2009 and 2011, grazing plans were developed on all of Webb's cattle leases as well as un-grazed units on the Yucca Pens Unit.

Past wildlife monitoring on BWWMA includes herpetological surveys, small-mammal surveys, a bat species inventory, and an avian species inventory. Herpetological drift fence surveys were conducted in 2004 for one-year and documented 37 of the 76 species known to occur in marshes, wet and dry prairies, hardwood hammocks, pine flatwoods, and cypress strands. Long periods of inundation forced researchers to shut down traps, resulting in the low number of identified species. No listed or focal species were captured. Area staff also conducted small mammal trapping in 2006 and 2007. Traps were set in marshes, wet and dry prairies, hardwood hammocks, pine flatwoods, and cypress strands for a period of 1,800 trap nights. Only 2 species were captured: hispid cotton rats (*Sigmodon hispidus*) and eastern wood rats (*Neotoma floridana*).

In May 2008, the Florida Bat Conservancy (FBC), a non-profit bat research and advocacy group, conducted a bat species inventory over a 3-night period. Using acoustic survey methods, FBC found 5 bat species: Brazilian free-tailed bat (*Tadarida brasiliensis*), Florida bonneted bat (*Eumops floridanus*), evening bat (*Nycticeius humeralis*), northern

yellow bat (*Lasiurus intermedius*), and Seminole bat (*Lasiurus seminolus*). The FBC also held a workshop for staff and provided guidance in placing bat houses on Webb. Florida bonneted bats and Brazilian free-tailed bats use these houses, which are protected during land management activities. Brazilian free-tailed bats were also known to occupy the Interstate 75 overpass at Tucker's Grade prior to 2010, when construction plans required bats to be excluded from the Interstate. In 2010, FWC constructed a large community bat house near the office to provide roosting habitat for Brazilian free-tailed bats in anticipation of their exclusion. These bats were excluded from the overpass in 2011 but have not yet taken up residence in the community bat house. For more information on Florida bonneted bat monitoring and management on BWWMA, see [Section 3.2.19](#).

The Sarasota Audubon Society and Dr. Oliver Hewett (from Cornell University) assisted the staff with avian inventories on Webb in the early 2000's. Surveys were conducted for 1 year at a frequency of 2 times per month to generate the Webb bird list. The Webb tract also hosts the Peace River Audubon Society's Christmas Bird Count, as well as an annual Breeding Bird Survey and National Migratory Bird Survey conducted by Cathy Olson, Lee County staff member. There are 91 bird species that are included in the BWWMA bird list, and the Breeding Bird Survey has documented 90 species with confirmed breeding in Lee County.

Additional survey efforts include monitoring of northern bobwhite, red-cockaded woodpecker, mourning dove (*Zenaida macroura*), and white-tailed deer (*Odocoileus virginianus*). See [Section 3.2.14](#) for information on red-cockaded woodpecker monitoring and [Section 3.2.13](#) for information on northern bobwhite monitoring. Since 2010, 76 mourning doves have been trapped and banded as part of a USFWS multi-state project to refine hunting regulations. To obtain population trend information, staff has conducted white-tailed deer spotlight counts on Webb since 1982 and on the Yucca Pens Unit since 2008. The population estimates over the last 5 years have varied from 936–1,146 on Webb and from 48–81 on the Yucca Pens Unit. Across BWWMA, staff record opportunistic wildlife observations and maintain a species list.

Section 3: Focal Species

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

The Public Lands Conservation Planning (PLCP) project, an expansion of the WHCNiFL project, added a few species and provided potential habitat modeling on public lands. For the PLCP, the FWC selected 60 focal species (including 1 group of species, the wading birds) for which statewide potential habitat maps were generated using each species' potential habitat model.

The FWC's 2003 landcover data served as the base layer for all potential habitat models, and staff selected additional layers considering the particular natural history of each species (e.g., species' range, known occurrence records); as such, each model is species-specific. Once statewide potential habitat maps were completed, a Population Viability Analysis (PVA) was conducted for each focal species.

The statewide landcover-based habitat models identified 20 of the 60 focal species to have potential habitat on BWWMA ([Section 3.1](#)). Two species, the gopher tortoise and Cooper's hawk, are not identified by the PLCP to have potential habitat on BWWMA, but have been documented on BWWMA by staff and species' experts. The Florida bonneted bat is not a focal species but was added to the list for BWWMA because it is a federally endangered species that occurs on the area. For all focal species modeled to have potential habitat on BWWMA, staff created area-specific potential habitat maps by using the same statewide models but replacing the landcover data with area-specific natural community data. The resulting area-specific potential habitat maps were then refined based on the input of local managers and species experts.

The WCPR Workshop for BWWMA held February 19-20, 2013, brought decision makers together to assess species' opportunities and needs, identify measurable objectives, outline necessary coordination efforts, and determine required actions such as monitoring and species management. To facilitate informed discussion of the species, WCPR staff compiled a workbook that contained information on the focal species. Participants at the workshop discussed the "level of opportunity and need" for each species. This included considering the number of statewide prioritizations the species triggered ([Statewide Species Prioritization Table](#)), the species' listing status, and the long-term security of the species (i.e., examining PVA results). Other factors considered were the species' use of actively managed communities ([Table 1](#)), species' response to management, and any local overriding factors (e.g., status of species in the region, local declines or extirpations). A brief summary of the opportunity and need assessments for each focal species is available in [Section 3.2](#).

3.1: Babcock-Webb Wildlife Management Area Focal Species List

Workshop participants assessed 23 species for their level of opportunity or need on BWWMA. In the following species list, we use a ¹ to denote species for which a measurable objective is identified, a ² for species for which some level of monitoring is recommended, a ³ for species for which a SMA is recommended, and a ⁴ for species for which species management is recommended. Occasionally, statewide models indicate a species has

potential habitat on the area, but the local assessment indicates there is little opportunity to manage for these species. These [limited opportunity species](#) are denoted with an *. Except for those species identified with a superscript number, workshop participants and expert reviewers determined that ongoing management would meet the needs of the focal species. For species with no numerical superscripts, participants and reviewers agreed there is no need for measurable objectives, monitoring, SMAs, or species-specific management.

Gopher frog (*Lithobates capito*)

Florida pine snake (*Pituophis melanoleucus mugitus*)

Gopher tortoise (*Gopherus polyphemus*)

American swallow-tailed kite (*Elanoides forficatus*)

Bachman's sparrow (*Peucaea aestivalis*)

Brown-headed nuthatch (*Sitta pusilla*)

Burrowing owl (*Athene cunicularia*)

Cooper's hawk (*Accipiter cooperii*)

Crested caracara (*Caracara cheriway*)

Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)*

Florida mottled duck (*Anas fulvigula*)

Florida sandhill crane (*Grus canadenses pratensis*)

Florida scrub-jay (*Aphelocoma coerulescens*)*

Limpkin (*Aramus guarana*)

Northern bobwhite (*Colinus virginianus*)^{2,4}

Red-cockaded woodpecker (*Picoides borealis*)^{1,2,3,4}

Southeastern American kestrel (*Falco sparverius paulus*)

Southern bald eagle (*Haliaeetus leucocephalus*)

Wading birds (Multiple species)

Florida black bear (*Ursus americanus floridanus*)

Florida bonneted bat (*Eumops floridanus*)^{1,2,4}

Florida panther (*Puma concolor coryi*)¹

Sherman's fox squirrel (*Sciurus niger shermani*)

3.2: Focal Species Opportunity/Needs Assessment

This section provides an assessment of the opportunities for management as well as the needs of each of the focal species. The assessment considers a number of attributes, including the status of a species, the number of prioritization parameters it triggers, the

species' response to management, and the amount and spatial arrangement of species' potential habitat available on the area. Because all federally listed wildlife are FWC-listed, we will provide only the federal listing status for federally listed species. When a species is not federally listed but is FWC-listed, we will provide the FWC listing status. The FWC is currently in the process of developing management plans for FWC-listed species. Staff will review these plans to determine if the content warrants a revision to any of these assessments and will revise this Strategy as warranted.

Unless otherwise noted, all reported acres of potential habitat are the result of using the area-specific natural community data in the species' potential habitat model. These estimates include all the area mapped in a natural community identified as potential habitat, including patches that may not be contiguous with other suitable habitat. During the workshop, participants considered the spatial arrangement and habitat patch size when assessing the potential role BWWMA plays in the conservation of each species. For species that require larger habitat patches, we considered the continuity and condition of habitat on lands adjacent to the WMA.

3.2.1: Gopher Frog

Gopher frogs have not been documented on BWWMA. A 2007-08 FNAI survey on BRP did not document gopher frogs. There is at least one gopher frog record in Charlotte County, but it is from 1940. Gopher frogs have not been documented in Lee County, but have been found in Collier County, south of BWWMA.

In Florida, gopher frog habitat is a subset of gopher tortoise habitat that contains fishless ephemeral wetlands in which gopher frogs breed. After breeding, gopher frogs move into surrounding upland habitat within a mile of the breeding pond. They prefer native, fire-maintained xeric habitats with intact groundcover, but can persist in areas with some habitat alteration. Gopher frogs often occupy gopher tortoise burrows, but they will use stump holes, hollow logs, and rodent or crayfish burrows.

Gopher frogs in Florida are an FWC-listed species of special concern, although the current [Species Action Plan](#) recommends removing gopher frogs from this list. Considered a moderate priority statewide, this species triggers 2 of 6 prioritization parameters ([priorities table](#)). Models indicate 43,768 acres of potential habitat within current natural communities on Webb and 13,219 acres on the Yucca Pens Unit. An additional 43,502 acres are available on BRP and HCWEA. Though the model indicates a large amount of potential habitat available for gopher frogs on these areas, it may be an overestimate. Potential habitat on BWWMA is primarily mesic flatwoods and lacks the drier, more xeric communities this species prefers. Gopher frogs will use mesic flatwoods if gopher tortoises are present, but tortoises are not common on BWWMA except on a few small areas. Although the model indicates a large amount of potential habitat, this species has not been detected on BWWMA.

Considering the limited amount of xeric uplands and lack of gopher tortoises, there is a low opportunity to influence the regional gopher frog population on BWWMA.

Ongoing land management actions, including prescribed fire in mesic flatwoods and isolated wetlands, are compatible with the needs of gopher frogs should they exist on BWWMA. [Section 4.3.1](#) provides additional land management recommendations to ensure BWWMA meets the needs of gopher frogs should they occur here. Monitoring should be opportunistic ([Section 5.2.4](#)). FWRI staff periodically dip-net for pond-breeding amphibians across Florida and may have the opportunity to survey BWWMA ([Section 6.1.4](#)).

The goal is to provide suitable habitat conditions for gopher frogs should they occur on BWWMA. By continuing to apply prescribed fire and maintaining suitable habitat conditions, BWWMA will fulfill its role for this species.

3.2.2: Florida Pine Snake

The Florida pine snake has not been documented on BWWMA. Pine snakes were not found in a 2007-08 FNAI survey on BRP. Florida pine snakes use a number of plant communities but they typically occupy pine-dominated areas with sandy soils and a well-developed grassy understory, such as upland pine and sandhill communities. Pine snakes actively seek out and burrow into pocket gopher mounds to capture pocket gophers (*Geomys pinetis*). Pocket gophers, however, are not common on or near BWWMA. Regardless pine snakes have been known to occupy areas where pocket gophers are absent.

The Florida pine snake triggers 3 of 6 prioritization parameters ([priorities table](#)) and is an FWC-listed species of special concern, although the current [Species Action Plan](#) recommends listing this species as Threatened. According to the literature, at least 2,471 acres of suitable habitat are required to support a viable population of pine snakes. BWWMA has a limited amount of the xeric natural communities this species requires and models indicate only 72 acres of potential habitat within natural communities on Webb and no potential habitat on the Yucca Pens Unit. Given the small amount of potential habitat on BWWMA, there is a low opportunity to support pine snakes on this area. Pine snakes have large home ranges and are vulnerable to habitat fragmentation, including the loss of travel corridors between suitable habitat. With little suitable habitat fragmented by largely dangerous roadways, BWWMA primarily functions to support the regional pine snake population.

Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical treatments that aid in restoring natural community structure and function. Stumps and other coarse woody debris should be retained during land management activities ([Section 4.3.2](#)). If contractors are used to accomplish land management objectives, they should be educated in what to do if they encounter a pine snake and directed to avoid damaging or destroying gopher tortoise burrows.

Because there are no herpetofauna surveys currently planned for BWWMA, opportunistic monitoring is recommended ([Section 5.2.4](#)). In 2013, FWRI researchers began a statewide Upland Snake Survey; the Florida pine snake is a target species in this survey. One method of collecting occurrence information for this study is documenting snakes observed along designated road routes, including a route on BWWMA. While drift-fence surveys will not provide population level information on pine snakes, any future drift-fence surveys conducted on the area should include the use of large upland snake traps to ensure adequate detection of large snakes.

The goal is to provide suitable habitat conditions to allow Florida pine snakes using BWWMA to function as part of a regional population. By continuing to apply prescribed fire and maintaining suitable habitat conditions, BWWMA will fulfill its role for this species.

3.2.3: Gopher Tortoise

Gopher tortoises are occasionally observed on BWWMA, but seem to be restricted to a few dry areas on ridges or along roads. A 2007-08 FNAI survey on BRP documented a high density of tortoises in the northeast corner of the property, overlapping the red-cockaded woodpecker population. Gopher tortoises are common in areas around BWWMA where water has been drained to allow for urban development.

The gopher tortoise is a management-responsive species that can serve as an indicator of properly managed upland pine or grassland communities. It prefers xeric upland habitat managed with frequent fire to maintain groundcover for cover and foraging. The gopher tortoise is considered a keystone species because many other species use their burrows, including focal species such as the Florida mouse and gopher frog.

This FWC-listed threatened species triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high priority species statewide. The 2007 FWC gopher tortoise management plan placed emphasis on increasing the number of tortoises on public lands. The FWC recently approved a revised [Gopher Tortoise Management Plan](#), with continued emphasis on habitat restoration on public lands.

Typically, gopher tortoises use drier flatwoods, or flatwoods associated with more xeric communities such as sandhill, scrub, and scrubby flatwoods. Models indicate no potential habitat for gopher tortoises on BWWMA. This is because the model uses a filter for restricting potential habitat to soils with high or moderate infiltration rates. Most of BWWMA is seasonally inundated and unsuitable for gopher tortoises because of water levels. Despite the lack of potential habitat modeled on BWWMA, gopher tortoises are found year-round on two raised mounds located along the northwest boundary of Webb and along a canal on the northern end of the Yucca Pens Unit. The model for potential gopher tortoise habitat may be too restrictive for southwest Florida, as tortoises seem to persist in seasonally-inundated areas of BWWMA. Even though gopher tortoises are periodically

found on BWWMA, the limited amount of habitat indicates that there is low opportunity to influence this species using natural community management.

Management actions that maintain or enhance habitat for this species include the frequent use of prescribed fire. Additional land management considerations can be found in [Section 4.3.3](#). Because gopher tortoises are occasionally observed on BWWMA, monitoring on BWWMA should be opportunistic. Staff should document all individuals and burrows when encountered outside where they commonly occur ([Section 5.2.4](#)).

The goal is to provide suitable habitat conditions to allow gopher tortoises using BWWMA to function as part of a regional population. By continuing to apply prescribed fire and maintaining suitable habitat conditions, BWWMA will fulfill its role for this species.

3.2.4: American Swallow-Tailed Kite

American swallow-tailed kites are occasionally observed on BWWMA. Nesting is suspected, based on observations of multiple birds in one area (Webb's South Walk-in unit) during the breeding season, but it has not been confirmed. A 2007-08 FNAI survey on BRP documented several kites, including juveniles, with nesting also suspected. The Avian Research and Conservation Institute (ARCI), a research organization that conducts statewide research on swallow-tailed kite populations, reports at least 4 known kite nests in the area, 3 of which are a few miles south of BWWMA.

American swallow-tailed kites are habitat generalists and utilize a variety of natural communities. Open areas are used for foraging, and trees that are dominant or taller than surrounding trees are preferred as nest trees. Shrub height and density tends to be higher around nest sites. Because this species has high nest site fidelity, maintaining suitability of nesting areas is important. Given the generalist nature of this species and its high mobility, it is not considered management dependent though it does benefit from active management to restore natural communities provided nest sites are not disturbed.

American swallow-tailed kites trigger 4 of 6 statewide prioritization parameters ([priorities table](#)), making them a moderate statewide priority. Models indicate 31,105 acres of potential kite habitat within natural communities on Webb and 8,570 acres on the Yucca Pens Unit. An additional 53,190 acres are available on BRP and HCWEA. Kites prefer nesting in areas with densely vegetated understory beneath tall pines. However, these conditions are not as common on Webb as the open habitat preferred by northern bobwhite or red-cockaded woodpeckers. Habitat on the Yucca Pens Unit has more areas with dense vegetation, and has not been managed with fire to the extent Webb has. Given the relatively large amount of potential habitat on BWWMA and the surrounding conservation lands, the opportunity for kites to use BWWMA is high.

Planned efforts to maintain natural community structure through timber thinning and prescribed fire will benefit kites by providing open areas for foraging. In addition, protection of wetlands and managing for open stands of mature native pines may provide nesting sites

for swallow-tailed kites on BWWMA. If nests are located on the area, management considerations around these sites should be used ([Section 4.3.4](#)) and the nest will be reported to ARCI ([Section 6.6](#)). If kite nesting activity is observed, this information should be documented and reported as well ([Section 5.2.4](#)).

The goal is to provide suitable habitat for the American swallow-tailed kite that will allow kites using BWWMA to function as part of a regional population. By maintaining pine stands in open condition for foraging and protecting mature nest-trees during management activities, area staff will meet the needs for this species on BWWMA. The amount of potential habitat on BWWMA and adjacent conservation areas increases the likelihood that American swallow-tailed kites will continue to persist on BWWMA.

3.2.5: Bachman's Sparrow

Bachman's sparrows are known to occur on both BWWMA and BRP. During a 2011 genetic survey of brown-headed nuthatches, TTRS biologists documented Bachman's sparrows on Webb. The Bachman's sparrow status on the Yucca Pens Unit is not known. A 2007-08 FNAI survey on BRP documented Bachman's sparrows at several locations, most commonly within red-cockaded woodpecker areas.

Bachman's sparrows prefer mature pine forests with a low basal area and healthy herbaceous vegetation, or early-succession old-field habitat. The Bachman's sparrow is responsive to management and the occurrence of fire is critical to sustaining this species. Use of an area by Bachman's sparrows declines rapidly around 18 months post-fire and sites are typically abandoned if fire is excluded for >3 years. In many areas, the optimal fire return interval necessary to achieve desired vegetative parameters for Bachman's sparrow habitat is 2-3 years. The fire return interval on Webb is supportive of the needs of Bachman's sparrows; however, this is not currently the case on the Yucca Pens Unit.

The Bachman's sparrow triggers 2 of 6 prioritization parameters ([priorities table](#)) and is currently experiencing range-wide population declines. Breeding Bird Survey data indicate a 3.2% decline per year range-wide with a 2.7% decline per year in Florida. Models indicate 38,975 acres of potential habitat within current natural communities on Webb and 7,824 acres on the Yucca Pens Unit. An additional 34,136 acres are available on BRP and HCWEA. On Webb, most of the potential habitat is currently in a condition that could support Bachman's sparrows. Literature suggests a minimum of 520 acres of contiguous habitat is required to maintain a viable population of Bachman's sparrows. Given this, Webb likely supports a population of Bachman's sparrows, but conditions at the Yucca Pens Unit are not favorable for the species and the population may not extend to that unit.

Current land management that depends on frequent fire and managing for open stands of mature native pines is compatible with the needs of the species on Webb. A more frequent fire return interval with an emphasis on increasing herbaceous vegetation on the Yucca Pens

Unit will improve habitat for Bachman's sparrows. Additional land management considerations are found in [Section 4.3.5](#).

FWC does not conduct monitoring for Bachman's sparrows on BWWMA but there is a Breeding Bird Survey route on Webb that has been surveyed by Lee County staff since 1990. Current northern bobwhite and red-cockaded woodpecker monitoring is sufficient to assess the effects of land management in the flatwoods communities where Bachman's sparrows and brown-headed nuthatches persist. Monitoring should be incidental and include only observations during the breeding season (April-June; [Section 5.2.4](#)).

The goal is to support a Bachman's sparrow population on BWWMA. Maintaining suitable upland habitat on BWWMA will allow the area to fulfill its role in the conservation of this species. The amount of potential habitat on BWWMA and adjacent conservation areas increases the likelihood that Bachman's sparrows will continue to persist on BWWMA provided managers can continue an active prescribed fire program.

3.2.6: Brown-Headed Nuthatch

Brown-headed nuthatches occur on BWWMA. In 2011, TTRS biologists conducted a genetic survey of brown-headed nuthatches on Webb and banded 30 individuals. The status of the species on the Yucca Pens Unit is not known. The brown-headed nuthatch is dependent on open stands of mature pine interspersed with snags in which the species excavates nesting cavities. Older pine forests (>35 years for longleaf [*Pinus palustris*] and slash pine [*P. elliottii*]) and stands with basal area between 35–50 ft²/ac (8-11 m²/ha) are preferred, but the species does inhabit younger and more dense stands. This species triggers 2 of 6 prioritization parameters (priorities table) and is currently experiencing range-wide declines due to habitat loss and degradation.

Models indicate 35,994 acres of potential habitat within natural communities on Webb and 11,848 acres on the Yucca Pens Unit. An additional 38,492 acres are available on BRP and HCWEA. Literature suggests 1,000 acres of habitat is necessary to support a viable population. On Webb, most of the potential habitat is currently in a condition that likely supports a population of brown-headed nuthatches. However, conditions at the Yucca Pens Unit may not be favorable for the species and the population may not extend to that unit.

Prescribed fire and silvicultural thinning are management actions that maintain and enhance habitat for brown-headed nuthatches. Managers should also use treatments that favor mature timber, retention of appropriate snags, and mechanical actions that restore natural community structure. Brown-headed nuthatches prefer a basal area of 30-50 ft²/ac and can become scarce in areas where pine basal area is too low, which should be addressed in timber management plans for Webb. Ongoing efforts to maintain natural community structure on BWWMA will increase suitability for brown-headed nuthatches within potential habitat. Current land management is compatible with the needs of the species on Webb, and

with increased prescribed fire and mechanical treatments, the suitability of the Yucca Pens Unit will improve. Additional land management considerations are found in [Section 4.3.6](#).

FWC does not conduct monitoring for brown-headed nuthatches on BWWMA but there is a Breeding Bird Survey route on Webb that has been surveyed by Lee County staff since 1990. Current northern bobwhite and red-cockaded woodpecker monitoring is sufficient to assess the effects of land management in the flatwoods communities where Bachman's sparrows and brown-headed nuthatches persist. Monitoring should be incidental and include only observations during the breeding season (February-June; [Section 5.2.5](#)).

The goal is to support a brown-headed nuthatch population on BWWMA. Continuing to apply prescribed fire and maintain suitable upland habitat on BWWMA will allow the area to fulfill its role in the conservation of this species. The amount of potential habitat on BWWMA and adjacent conservation areas increases the likelihood that brown-headed nuthatches will continue to persist on BWWMA, provided managers can continue an active prescribed fire program.

3.2.7: Burrowing Owl

Burrowing owls are rare on BWWMA. In 2001, staff observed 2 individuals in MU 44, but the species has not been documented since. There is a colony of burrowing owls in Cape Coral to the south of the Yucca Pens Unit and there are recorded occurrences in Punta Gorda. A 2007-08 FNAI survey on BRP documented burrowing owls in several agricultural fields on the area. Attempts to relocate the burrows on BRP in 2012 were unsuccessful as the burrows became inundated with water.

Burrowing owls require open, treeless areas with low groundcover and sandy soils for excavating burrows. Burrowing owls historically preferred dry prairie habitat, however, most modern populations are found in non-native and altered habitats, including raised mounds or canal banks. This species uses underground burrows extensively, particularly during the spring for nesting and in the winter for protection from predators. Optimal habitat for this species includes soils that remain dry during times of peak burrow use. Much of current burrowing owl habitat occurs in private and urban areas that are prone to future development. Therefore, any populations on public land are important to the persistence of this species.

The burrowing owl is a species of special concern in Florida, although the current [Species Action Plan](#) recommends listing this species as Threatened. The burrowing owl triggers 4 of the 6 statewide prioritization parameters ([priorities table](#)). Models indicate 11,313 acres of potential habitat for burrowing owls within current natural communities on Webb and 370 acres on the Yucca Pens Unit. An additional 14,721 acres are available on BRP and HCWEA. Most of the modeled potential habitat on BWWMA is dry prairie and pasture or ruderal areas that contain sparse trees. Although these areas are typically inundated during the wet season (June-October), owls tend to use burrows less in the summer when

young have already fledged. Therefore, seasonally-inundated habitat on BWWMA can still be highly suitable for burrowing owls when managed appropriately.

Burrowing owls prefer to forage in areas with low levels of groundcover. Planned management actions, including prescribed fire, should benefit the burrowing owl by providing open foraging habitat. [Section 4.3.7](#) contains land management recommendations for this species. Opportunistic monitoring is recommended for this species ([Section 5.2.4](#)), and when observed during the nesting season (February-June), managers should attempt to locate any existing burrows.

The goal is to provide habitat for burrowing owls that will allow individuals using BWWMA to function as part of a regional population. By maintaining open groundcover through prescribed burning and mechanical actions, BWWMA can provide suitable habitat for the burrowing owl and increase the likelihood of that this species will continue to persist on public lands.

3.2.8: Cooper's Hawk

Cooper's hawks are occasionally observed on BWWMA. A 2007-08 FNAI survey on BRP documented 2 individuals. There are very few records for Charlotte County and no confirmed breeding records since 1994. Cooper's hawks are commonly associated with woodlands and nest in a variety of habitats, including swamps, floodplain and bottomland forests, sand pine scrub, and baygalls. Cooper's hawks primarily feed on other birds and are found nesting in areas managed for upland game birds, such as the northern bobwhite. Nests usually are placed near the crown of a tree close to an edge in dense stands of oaks.

The Cooper's hawk triggers 1 of 6 prioritization parameters ([priorities table](#)). From a regional perspective, BWWMA and the surrounding lands comprise a mosaic of conservation areas, private lands, and residential development that could support a regional population of Cooper's hawks. However, BWWMA is near the southern limit of the breeding range in Florida and the species may not be as common as in other parts of the range. While models indicate no potential Cooper's hawk habitat on BWWMA, this is a result of the model's complexity; as Cooper's hawks have been observed using the area. Models also identified 46,432 acres of potential habitat on BRP, which has more of the mosaic of forested wet areas, open land, and pinelands near appropriate nesting habitat preferred by the species. Given its proximity to BRP and the occasional observation on the area, the model likely underestimates potential habitat for Cooper's hawks on BWWMA.

Cooper's hawks are not considered management dependent and opportunities to manage for Cooper's hawks on BWWMA are low. Although BWWMA can support occasional use, long-term breeding is unlikely given the area is on the southern periphery of the Cooper's hawk breeding range. Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical actions that aid in restoring natural community structure and benefit upland bird species ([Section 4.3.8](#)).

During the nesting season (April-July), the Cooper's hawk is secretive and sensitive to disturbance near the nest site. No attempt will be made to actively search for nests, but incidental observations of nesting or breeding behavior will be noted ([Section 5.2.4](#)) and nesting areas will be protected from disturbance ([Section 4.3.8](#)).

The goal is to provide habitat for the Cooper's hawk that will allow individuals using BWWMA to function as part of the regional population. Maintaining upland habitat in suitable condition with prescribed fire and mechanical actions will support occasional use and allow the area to fulfill its role in the conservation of this species.

3.2.9: Crested Caracara

Crested caracaras are rarely seen on BWWMA and the area is on the western limit of the species' range. Caracaras have been documented on BRP since the 1970s and a FNAI survey documented several caracaras on BRP in 2008. Although no nests were found during FNAI's survey, at least 1 nest has been documented on BRP since the FNAI survey.

Caracaras prefer to forage in open areas with low ground and shrub cover. Currently much of the state's caracara population utilizes open pasture on private lands, so protection of any caracaras on public lands should be a priority. Caracaras typically build their nests in a cabbage palm (*Sabal palmetto*) in an open area with scattered trees. Caracaras have high nest site fidelity; therefore, protection of known nest sites is important to promoting continued use.

The crested caracara is listed as federally Threatened and triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high statewide priority. A majority of the crested caracara population in Florida occurs on private lands that are prone to future degradation and development, therefore, caracaras that occur on public conservation lands need to be a high priority. Models indicate 41,179 acres of potential habitat for crested caracaras within natural communities on Webb and 8,185 acres on the Yucca Pens Unit. An additional 46,966 acres are available on BRP and HCWEA. Given that caracaras have relatively large home range sizes (average of 3,000 acres), BWWMA could be important to the regional caracara population as it could potentially support up to 17 breeding pairs. However, most of the potential habitat modeled for BWWMA (36,787 acres) is mesic flatwoods, which is not a primary habitat type for caracaras. Mesic flatwoods can provide foraging opportunities, but may not comprise an entire caracara territory. The remaining habitat is dry prairie, pastures, and ruderal, and is in a condition that could support use by caracaras. There are more acres of pasture on BRP, which may be why caracaras are more common on that area. The proximity to pastures and dry prairie on BRP and other private ranches in the vicinity increases the likelihood that there is a regional population of caracaras utilizing both the public and private lands; however, BWWMA could not independently sustain a population of crested caracaras.

In foraging habitats, caracaras prefer low groundcover, such as that in newly mowed or burned areas. Therefore, ongoing efforts to restore and maintain natural community structure and function through prescribed fire will benefit this species. Since occurrences on BWWMA are rare, caracaras should be documented when they are observed ([Section 5.2.4](#)). If there is reason to believe nesting is occurring in the area, staff should attempt to locate and document the nest. Nests are typically built in the tallest cabbage palms within isolated stands or open pastures. If nests are detected, management considerations around these sites will be implemented ([Section 4.3.9](#)).

The goal is to provide habitat for crested caracaras that will allow individuals using BWWMA to function as part of a regional population. FWC staff can achieve this goal by keeping potential caracara habitat in an open condition with frequent prescribed burn. The large amount of potential habitat on BWWMA and surrounding conservation areas increases the potential for this species to persist regionally.

3.2.10: Florida Mottled Duck

Florida mottled ducks are occasionally observed on BWWMA, often during the summer months, and ducklings have been observed only once. Mottled ducks nest in dry marshes, pine flatwoods, citrus groves, and urban areas that occur near shallow wetlands. Females tend to locate their nests in dense vegetation (tall grasses, rushes, or palmetto thickets) on the ground near water. This species prefers water <10 inches deep and wetlands with emergent vegetation.

The mottled duck is not listed by either the FWC or the USFWS. This species triggers 2 of the 6 statewide prioritization parameters ([priorities table](#)), making it a medium priority statewide. Models indicate 24,577 acres of potential habitat for mottled ducks on Webb and 120 acres on the Yucca Pens Unit. An additional 2,688 acres is available on BRP. Ongoing hydrologic restoration on the Gator Slough watershed can increase foraging habitat for Florida mottled ducks within and around BWWMA ([Section 2](#)). Because mottled ducks respond to conditions at the regional level, this species is a low priority for species-specific management on BWWMA.

Ongoing efforts to restore and maintain natural community structure should meet the needs of this species on BWWMA. Managers can enhance potential foraging habitat through management activities that provide a mosaic of open water and cover within shallow emergent wetlands. Patchy burns can promote nesting habitat by leaving patches of dense vegetation. Mottled ducks nest from February-March and land management activities should avoid known nests until the young have hatched. Observations of nests or newly hatched ducklings should be documented ([Section 5.2.4](#)). Because FWC monitors this species at the regional level, surveys specific to BWWMA are not recommended.

The goal is to provide habitat for mottled ducks that will allow individuals using BWWMA to continue to function as part of a regional population. The continued presence

of this species on the BWWMA is largely dependent on regional conditions, and hydrologic restoration with ongoing land management will improve foraging and nesting habitat for this species. The proximity of BWWMA to concentrated mottled duck populations increases the chances of this species' long-term persistence in this area.

3.2.11: Florida Sandhill Crane

Florida sandhill cranes are common on BWWMA, and adults with flightless young are seen frequently during the breeding season. Nesting is suspected, but staff has not documented any crane nests recently and does not actively search for crane nests. In 1988, 34 ponds on BWWMA were used by nesting Florida sandhill cranes. Research done at these ponds was included in a PhD. dissertation¹ as well as a follow-up report preparing for the introduction of whooping cranes (*Grus americana*) in Florida. A FNAI ground-survey on BRP did not document any nesting cranes in 2007 or 2008, but adults and juveniles were observed. However, a helicopter survey conducted by FNAI the same year found 1 nest.

The Florida sandhill crane is listed as Threatened by the FWC and triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a moderate to high statewide priority. Sandhill cranes use shallow wetlands and adjacent upland habitats. Standing water is an important component of nesting habitat for Florida sandhill cranes. Nests consist of herbaceous plant material mounded in shallow water or marshy areas. Sandhill cranes prefer uplands that have a majority of the vegetative cover ≤ 20 inches in height, and they do not use uplands that become overgrown or shrubby. Habitat used includes a mosaic of emergent palustrine wetlands and open uplands such as pasture, prairie, and open pinelands.

Models indicate 58,591 acres of potential habitat within natural communities on Webb and 9,534 acres on the Yucca Pens Unit. An additional 54,106 acres are available on BRP and HCWEA. Sandhill crane home range size varies seasonally and regionally, with adult pairs requiring approximately 300-600 acres. Due to the area's long history of prescribed fire, much of the potential habitat on Webb currently has suitable vegetative conditions that are preferred by sandhill cranes. Potential habitat on the Yucca Pens Unit is less suitable, with more areas of dense vegetation and less prescribed fire management. Given the relatively large amount of potential habitat on BWWMA and the surrounding conservation lands, the opportunity to provide foraging and nesting habitat for sandhill cranes is high.

Prescribed fire and mechanical treatments that maintains upland communities in an open condition will provide suitable foraging habitat for cranes. Efforts should be made to protect known nests during land management activities ([Section 4.3.10](#)). Hydrologic restoration on BWWMA will improve hydroperiod and nesting suitability for sandhill cranes (see the Hydrology discussion in [Section 2](#)). Monitoring is not recommended at this time, however nesting birds and flightless young should be documented when opportunistically observed ([Section 5.2.4](#)). FWC is currently developing a management plan for the Florida

sandhill crane may include monitoring or management recommendations for areas such as BWWMA. Management strategies for this species should be altered at such time as recommendations become available.

The goal is to maintain the presence of breeding Florida sandhill cranes on BWWMA. Hydrologic restoration and allowing prescribed fires to burn into wetlands will create suitable habitat conditions that allow BWWMA to meet its goal for the sandhill crane. The large amount of potential habitat on BWWMA and surrounding conservation areas increases the potential for this species to persist regionally.

⁴Bishop, M. A. 1988. Factors affecting productivity and habitat use of Florida sandhill cranes (*Grus canadensis pratensis*): an evaluation of three areas in central Florida for a non-migratory population of whooping cranes (*Grus americana*). Dissertation, University of Florida, Gainesville, USA.

3.2.12: Limpkin

Limpkins are occasionally observed on BWWMA, with at least 1 documented nest near an employee residence. Limpkins are observed feeding in ditches and canals on and around BWWMA and a FNAI survey on BRP documented 2 individuals in 2008. Limpkins are highly mobile and influenced by regional conditions, such as water levels and the availability freshwater mollusks, however, they typically remain in an area as long as habitat is suitable. Limpkins typically inhabit freshwater marshes, swamps, springs, and spring runs.

Limpkins are a FWC species of special concern, although the current [Species Action Plan](#) recommends removing this species from the list. The limpkin triggers 1 of 6 prioritization parameters ([priorities table](#)). Models indicate 12,113 acres of potential habitat for this species on Webb and 1,167 acres on the Yucca Pens Unit. An additional 10,139 acres is available on BRP and HCWEA. Given the relatively large amount of potential habitat on BWWMA and the surrounding conservation lands, the opportunity to provide limpkin habitat is high. However, limpkins are not considered management-dependent and the potential for targeted actions on BWWMA is low. While limpkins live in wetland habitats that are not actively managed, the use of prescribed fire in flatwoods and marshes can prevent shrub encroachment and enhance foraging opportunities ([Section 4.3.11](#)). Ongoing actions to protect wetland habitat, maintain water quality, and restore hydrology in the Gator Slough watershed keeps habitat in suitable condition for limpkin on BWWMA. Because this species has significant dispersal capabilities and is affected by regional water levels, local monitoring is not recommended. Area staff should document the occurrence and location of opportunistic observations of limpkin nests and adults with young ([Section 5.2.4](#)).

The goal is to provide suitable habitat for limpkins that will allow individuals using BWWMA to function as part of a regional population. Current land management and ongoing water improvement projects are sufficient in providing habitat conditions suitable

for limpkin to use BWWMA. The large amount of potential habitat on BWWMA and surrounding conservation areas increases the potential for this species to persist regionally.

3.2.13: Northern Bobwhite

Northern bobwhites are frequently observed in flatwoods and dry prairies on BWWMA and are a highly-important game species for the area. The primary justification for purchasing the Webb tract with Pitman-Robertson Act funds was to support a harvestable population of northern bobwhite. Breeding has been documented on BWWMA, and area-specific research and monitoring are on-going at Webb. Northern bobwhites have experienced significant range-wide population declines since the 1980s and are currently a major focus of many initiatives including the Upland Ecosystem Restoration Project. Northern bobwhites are typically associated with open canopy forests and grassland communities dominated by warm-season grasses, legumes, and patchy bare ground. Bobwhites use areas with early-successional herbaceous cover for brooding and foraging; shrubs or other thickets are useful as roosting habitat or escape cover.

Northern bobwhites trigger 2 of 6 prioritization parameters ([priorities table](#)). Models indicate 48,479 acres of potential habitat for the bobwhite within current natural communities on Webb and 12,270 acres on the Yucca Pens Unit. An additional 56,843 acres of potential habitat are available on BRP and HCWEA. BWWMA contains enough habitat to support a population of northern bobwhites and the species is a high priority on the area. On Webb, most of the modeled potential habitat is currently suitable for use by northern bobwhite. The flatwoods on Webb are burned approximately every 2 years and have a relatively low basal area and shrub height. Due to the large amount of available habitat, there is good opportunity to influence this species through natural community management on BWWMA. Potential habitat is less suitable for northern bobwhite on the Yucca Pens Unit, however occupancy and breeding have been documented there.

Quail hunting has been and continues to be an important recreational activity on BWWMA and the northern bobwhite has been a focus of management since the 1940s. The northern bobwhite population has varied widely over time, as have harvest numbers and pressure from hunting. Since 1978, the population on BWWMA has declined and remains at a low level. In 1988, staff altered the BWWMA's northern bobwhite hunting regulations to reduce hunting pressure on the bobwhite population, and the length of the hunting season was reduced 3 times before 1996. While hunting on the Yucca Pens Unit is currently allowed for the length of the normal small game season, bobwhite hunting on Webb is now shorter than the statewide season, and hunting pressure is spread across 8 segregated zones. The population continues to decline despite the FWC's decision to reduce hunting pressure on Webb from 864 man-days to 432 man-days in 2009. Since this reduction, annual harvest for northern bobwhite is <1,000 birds. Staff and researchers have initiated several studies intended to determine the cause of the population decline.

From 2002-2009, the FWC lead research to evaluate factors affecting population density of northern bobwhite on BWWMA, including whether harvest or hunting pressure influences bobwhite demographics on Webb. The results of this project demonstrated 3 primary conclusions: 1) cover may be limiting, 2) harvest was the principal source of mortality, and 3) estimated survival and reproductive rates suggest an unstable population growth. These results provided the impetus for a second study that was initiated by FWC in 2010. The primary purpose of the new study is to evaluate burn unit size and determine how prescribed fire affects the suitability of bobwhite habitat. This study also monitors radio-tagged birds to assess habitat use across burn zones. For the purpose of the study, the 8 zones are managed as follows: 2 zones are burned using a strip method; 2 zones receive checkerboard burns; 2 zones are large tracts where half the zone is burned annually; and the 2 remaining zones are burned using the strip method but are not included in the new study. These methods represent a significant change from how prescribed fire was applied to the landscape on Webb prior to the project.

In 2012, the United States Geologic Survey (USGS) initiated an adaptive management study to identify the most important factors limiting northern bobwhite abundance (e.g. weather, food, excessive harvest). This study was completed in 2013, and a final report has been reviewed by the FWC. The report suggests that the best strategy for increasing population growth is to continue small-scale burns and lowered harvest rates. In general, prescribed fire (2-3 year return interval) is recommended to maintain groundcover at a suitable level for bobwhites. Prescribed fire should be applied in a mosaic fashion using varying ignition techniques and weather conditions to provide a variety of habitats for nesting, foraging, and escape cover. Species management activities for northern bobwhite include annual maintenance of approximately 425 acres of wildlife food plots ([Section 5.1.1](#)).

Staff conducted spring call counts on BWWMA from 1982-2002, but discontinued this effort because results were not providing adequate information to determine the effectiveness of management. Fall covey counts were initiated in 2008 on Webb and are ongoing ([Section 5.2.1](#)). The purpose of surveys is to estimate the fall population, determine appropriate harvest rates, and evaluate the effectiveness of management strategies. In 2012, the fall population was estimated at approximately 11,000 birds on Webb, although the current equation may overestimate population size. To address this, TTRS is exploring the use of a new audio technique that may give a more accurate population estimate. The benefit of this new technique is that one person can survey multiple points in one morning over a large area, reducing the time and personnel necessary to conduct surveys. Monitoring is not currently conducted on the Yucca Pens Unit, largely because of limitations with staff resources. Future monitoring requirements will be known once research is concluded.

The goal is to maintain a harvestable population of northern bobwhites on BWWMA. By continuing a 2-3 year burn interval, maintaining food plots, and monitoring coveys annually, management at BWWMA should fulfill its role for this species. As the results of the high-intensity burn treatment study become available, staff will identify actions that can

contribute to the growth of the northern bobwhite population on BWWMA. The large amount of potential habitat that is managed primarily for the benefit of the northern bobwhite should support a harvestable population on BWWMA, if measures to control annual harvest continue. Due to the ongoing efforts to manage and monitor bobwhite communities on BWWMA, no objectives are recommended at this time

3.2.14: Red-Cockaded Woodpecker

BWWMA supports 1 of only 4 red-cockaded woodpecker populations on public lands entirely within the hydric slash pine eco-region. The red-cockaded woodpecker population on BWWMA is part of the USFWS South/Central Florida Recovery Unit, which also includes the Avon Park Air Force Range, J.W. Corbett/Dupuis Wildlife Management Area and Three Lakes Wildlife Management Area. With the capacity to harbor ≥ 10 active clusters, Webb's red-cockaded woodpecker population is designated an essential support population in the [USFWS's Recovery Plan](#). Red-cockaded woodpeckers also occur at BRP, primarily in the longleaf pine flatwoods on the northeast corner of the property.

The red-cockaded woodpecker requires open, mature pine woodlands that have a diversity of grass, forbs, and shrubs. This species is management responsive and can be an indicator of properly managed pine stands. It is often considered an umbrella species as many other species benefit from management designed for this species. Red-cockaded woodpeckers nest in cavities in mature live pines and have occupied artificial cavity inserts. Optimal foraging and nesting habitat for the species includes a reduced hardwood component and limited hardwood mid-story height.

Red-cockaded woodpeckers are federally Endangered and trigger 4 of 6 prioritization parameters ([priorities table](#)). The only prioritization parameters not triggered are the PVA parameters. However, the results of this PVA should be used with caution as several of the model's assumptions are not suited to this species, and the model had a higher starting population than the known population. This species is a moderate to high priority statewide. The federal recovery plan for this species calls for a delisting goal of 250 potential breeding groups (PBGs) in the South/Central Florida Recovery Unit, with at least 6 populations containing >40 PBGs. Populations with >40 PBGs are believed to have a higher chance of long-term persistence. The BWWMA population is important in maintaining the regional diversity of red-cockaded woodpeckers and is an essential support population in the range-wide recovery of the species. Therefore, management of red-cockaded woodpeckers on BWWMA is a high priority

Models indicate 35,883 acres of potential habitat within current natural communities on Webb and 11,846 acres on the Yucca Pens Unit. An additional 33,833 acres are available on BRP. The [FWC red-cockaded woodpecker management plan](#) calls for BWWMA to have 25 PBGs by the year 2020. BWWMA's most recent red-cockaded woodpecker management plan includes a population goal of 28 PBGs by 2008. The FWC has actively managed and

monitored BWWMA's red-cockaded woodpecker population since 1999. In 2002, the first year for which PBG data is available, there were 23 active clusters and 21 PBGs. In 2013, the annual cavity tree survey on Webb revealed 38 active clusters. Roost checks confirmed 28 PBGs, 10 solitary bird clusters, 16 recruitment clusters, and 2 inactive clusters, for 56 total clusters. All 28 PBGs (100%) attempted nesting. During the 2013 nesting season, staff documented 73 adult red-cockaded woodpeckers occupying 38 clusters, yielding an average group size of 1.92. The total number of red-cockaded woodpeckers observed in 2013 was 103 birds. Red-cockaded woodpeckers have not been found on the Yucca Pens Unit since 2010, although 2 inactive and 1 recruitment clusters exist in the northeast corner of the unit.

BWWMA participates in the Southern Range Translocation Cooperative and has been a recipient site for red-cockaded woodpecker translocations. BWWMA received 3 pairs each in 2005 and in 2008. However, BWWMA has since increased the number of PBGs to nearly 30 groups, and is no longer eligible to receive birds from the Cooperative.

The red-cockaded woodpecker population on Webb comprises 3 aggregations of occupied clusters. The geographic separation between aggregations appears to be increasing. In response to concerns over this trend and timber management issues, FWC staff created a Red-Cockaded Woodpecker Management Advisory Group (RCWMAG) in 2012. The objective of this group is to identify problems, actions, and deliverables as related to the successful management of Webb's red-cockaded woodpecker population and associated timber resources. The RCWMAG also works to build consensus among all staff involved in the sustainable management of area resources. This group identified the following problems associated with managing red-cockaded woodpeckers on Webb:

- BWWMA lacks suitable older pine trees for inserts (artificial cavities); there is an age gap in pine trees and they are not spaced appropriately.
- Older trees require protection from fire.
- BWWMA staff has many obligations with limited available time for management of red-cockaded woodpeckers.
- Red-cockaded woodpeckers are much more likely to be limited by cavity trees than by foraging habitat.
- Connectivity between groups is lacking and clusters are prone to isolation.

The historic lack of pine recruitment has been a serious problem to the pine communities on Webb. The area was clearcut in the 1930s and natural regeneration has not resulted in adequate stocking rates. The limited dispersal capabilities of pine trees have left large treeless areas and tree density is often low in areas where regeneration occurred. These factors have limited where red-cockaded woodpeckers can establish cavities and forage, as well as where managers can place recruitment clusters.

The RCWMAG's current course is to conduct timber assessments on Webb across the entire area and focused within red-cockaded woodpecker clusters. These assessments will be used to design management actions aimed at improving long-term sustainability of area resources (cavity tree production, foraging habitat, barrier reduction). Actions initiated by the RCWMAG include thinning small (<8") pines on approximately 500 acres outside of

current clusters on both Webb and the Yucca Pens Unit, planting 3-4 small pine plantations, and increasing summer burns within clusters to improve natural pine recruitment.

Prescribed fire combined with intensive mechanical vegetation removal (palmetto chopping) since 1982 has significantly reduced mid-story height within red-cockaded woodpecker habitat on Webb. Management units containing red-cockaded woodpecker clusters are maintained on as close to a 2-year burn interval as conditions allow. The burn rotation for flatwoods associated with all active (and most inactive) clusters on Webb is currently up-to-date. Habitat conditions at the Yucca Pens Unit are less suitable for use by red-cockaded woodpeckers, but continued restoration and maintenance will improve these conditions within a timeframe that is beyond the scope of this Strategy.

BWWMA's current [Red-Cockaded Woodpecker Management Plan](#) (2003-2008) lists 3 short- and 2 long-term goals. Short-term management goals focus on:

1. Maintaining occupied clusters,
2. Improving the connectivity among and between cluster aggregations, and
3. Determining historic pine stocking levels as well as quantitatively assessing the size-class distribution of the forest.

Long-term management goals focus on improving pine recruitment, and expanding the spatial extent of the red-cockaded woodpecker population. This plan also recommends that the current population monitoring protocols be continued. This plan should be updated by the RCWMAG with reviews by other appropriate experts.

Dry prairie is not typically a habitat used by red-cockaded woodpeckers due to the lack of mature pines. However, portions of prairie on Webb contain scattered pine trees as a result of past plantings or regeneration from adjacent flatwoods. Some of the habitat previously mapped as prairie by FNAI could once have been considered flatwoods, and will be re-evaluated in 2014 as part of an area-wide re-mapping of natural communities. Areas that will be re-mapped as historic flatwoods can help improve connectivity between red-cockaded woodpecker clusters if restored to a condition suitable for woodpecker habitat.

To maintain and enhance connectivity between red-cockaded woodpecker clusters on BWWMA, sections of Webb should be incorporated into an SMA ([Section 4.1.1](#)). Smaller blocks of treeless areas may receive pine plantings to improve connectivity between clusters, while large blocks of dry prairie will remain treeless and continue to be managed as prairie (open with frequent burns). Because the FNAI assessment could change the current natural communities map for BWWMA, the areas designated as part of an SMA will be identified only after re-mapping is complete.

Species management ([Section 5.1.2](#)) includes translocation of sub-adult birds and the use of artificial cavities (i.e., inserts, drilled cavity starts, complete drilled cavities) to create recruitment clusters and to enhance existing clusters that do not have enough suitable cavities. Recruitment clusters have been installed along State Road 31 in an attempt to connect BWWMA with the red-cockaded woodpecker population on BRP. Monitoring includes cluster and cavity status checks; nest checks and chick banding; fledge checks; and monitoring of banded birds ([Section 5.2.2](#)).

The goal is to provide suitable habitat on BWWMA to support a stable or growing population of red-cockaded woodpeckers that interacts with the larger regional metapopulation. By addressing the pine recruitment and distribution, continuing to apply prescribed fire, maintaining suitable habitat conditions, and continuing appropriate species management, BWWMA will fulfill its role for this species. The measurable objective is to:

- 1) By the end of 2015, update the BWWMA Red-Cockaded Woodpecker Management Plan.

3.2.15: Southeastern American Kestrel

Southeastern American kestrels are occasionally observed on BWWMA. A 2007-08 FNAI survey on BRP did not document southeastern American kestrels. Southeastern American kestrels utilize upland habitats including sandhills, longleaf savannas, pastures, sand pine scrub, and prairies. As a secondary-cavity nester, southeastern American kestrels use previously excavated cavities in large snags as well as artificial cavities in suitable habitat. Kestrels require adequate perch sites within foraging areas for hunting, and low ground cover (<1 ft) and an open canopy (<20% cover) are ideal for this species. Average kestrel breeding territory size is 125 acres, though more area may be necessary if the habitat quality is marginal.

Southeastern American kestrels are listed by the FWC as Threatened and the species trigger 4 of 6 prioritization parameters ([priorities table](#)). Models indicate 45,280 acres of potential habitat within natural communities on Webb and 9,340 acres on the Yucca Pens Unit. An additional 48,290 acres are available on BRP and HCWEA. On BWWMA, the majority natural community types within potential habitat are mesic flatwoods and basin marsh. These natural communities are not a primary habitat type used by southeastern American kestrels unless within a mosaic of sandhills. Since there are no sandhill communities present on BWWMA, the models overestimate potential habitat.

In 2007, BWWMA was assessed for suitability of kestrel nest boxes. Consultation with species experts indicated that BWWMA is at the southern extent of the southeastern American kestrel range and nest boxes currently would have a low probability of being occupied. While BWWMA is not part of a core southeastern American kestrel area in Florida, kestrels have been known to breed in Charlotte and Lee Counties, and BWWMA offers a significant amount of appropriate habitat for this species. Therefore, southeastern American kestrels are a moderate to low priority for species management on BWWMA.

Land management actions for this species include prescribed burning that maintains mature open stands of native pine habitat, and mechanical actions that aid in restoring natural community structure. Additional land management considerations can be found in [Section 4.3.14](#). Monitoring for southeastern American kestrels on BWWMA should be opportunistic ([Section 5.2.4](#)).

The goal is to provide habitat for southeastern American kestrels that will allow individuals using BWWMA to function as part of a regional population. Factors affecting the regional population will influence the kestrel's long-term use of BWWMA, though staff can maintain potential habitat in a suitable condition by retaining mature snags and applying frequent prescribed fire. Even in the absence of primary habitat types like sandhill, BWWMA can fulfill its role for this species and help support the regional population.

3.2.16: Southern Bald Eagle

Southern bald eagles are occasionally observed on BWWMA, and at least 4 nests occur on the area. Three nests were last surveyed in 2010, with 2 active at that time and 1 last active in 2008. Staff has located 1 additional nest on the area since 2010. Twenty-two nests occur within 3 miles of the property boundary; many of these nests were active in 2010.

The bald eagle does not trigger any of the prioritization parameters, but is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The FWC approved a [Bald Eagle Management Plan](#) in 2008 to ensure the continued recovery of this species. This plan designated 16 Core Nesting Areas, which are defined as areas containing high densities of bald eagle nesting territories. Regionally, BWWMA and the greater complex of surrounding conservation lands are located within the coastal Charlotte County and near the Placida Peninsula Core Nesting Area.

Models indicate 55,145 acres of potential habitat within natural communities on Webb and 11,211 acres on the Yucca Pens Unit. An additional 50,268 acres are available on BRP and HCWEA. While there is a large amount of potential habitat on BWWMA and surrounding conservation lands, bald eagles are not considered management-dependent and the opportunity for species management on BWWMA is low. However, the opportunity to support the regional population is high, and ongoing efforts to maintain mature stands of trees will benefit this species, provided nest protection guidelines are followed. Any activities around nest sites will be conducted according to the guidelines listed in the management plan ([Section 4.3.15](#)). New nesting sites will be documented and reported to FWC's Bald Eagle Management Plan Coordinator ([Section 5.2.4](#) and [Section 6.1.1](#)). Monitoring of this wide-ranging species is more appropriate at a statewide or regional level, therefore no additional monitoring is recommended for bald eagles on BWWMA.

The goal is to provide suitable habitat for the southern bald eagle that will allow individuals using BWWMA to function as part of a regional population. Staff will continue management that favors mature native pines and protects water quality, and by doing so will ensure BWWMA fulfills its role in the conservation of the bald eagle. The amount of potential habitat on BWWMA and adjacent conservation areas increases the likelihood that bald eagles will continue to persist on BWWMA.

3.2.17: Wading Birds

All 8 focal species of wading birds [great egret (*Ardea alba*), snowy egret (*Egretta thula*), little blue heron (*E. caerulea*), tricolored heron (*E. tricolor*), reddish egret (*E. rufescens*), white ibis (*Eudocimus albus*), wood stork (*Mycteria americana*), and roseate spoonbill (*Platalea ajaja*)] have been documented on BWWMA. Staff is not aware of any current wading bird nesting colonies on BWWMA, though colonies have occurred on the area in the past. A 2007-08 FNAI survey on BRP documented 2 mixed-species nesting colonies, as well as several mixed-species night roosts. Regionally, BWWMA falls within the core foraging area for 3 wood stork colonies (based on 2010 data). Despite their ability to travel long distances in search of food, regional water levels influence nest site location by wood storks and other wading birds.

Statewide, this group of species is a moderate priority. Several species are FWC-listed species of special concern and the USFWS lists the wood stork as federally Endangered. The current [Species Action Plan](#) for this group recommends listing the little blue heron, the tricolored heron, and the reddish egret as Threatened, while removing the white ibis and snowy egret from the species of special concern list. The Millsap biological scores for the reddish egret, little blue heron, and wood stork are high. According to [Florida's State Wildlife Action Plan](#), the snowy egret, little blue heron, and roseate spoonbill have declining population trends while the tricolored heron and white ibis have unknown trends ([priorities table](#)).

Models indicate 24,427 acres of potential habitat within natural communities on Webb and 5,894 acres on the Yucca Pens Unit. An additional 23,164 acres are available on BRP and HCWEA. Given the relatively large amount of potential habitat on BWWMA and the surrounding conservation lands, the opportunity to provide wading bird foraging and roosting habitat is high. Large wading bird nesting colonies are uncommon on the area, possibly because of the lack of suitable nesting habitat, but it is likely that smaller colonies occur. Nest colony searches are recommended if funding becomes available.

Wading birds are highly influenced by regional water levels. Drought or excessive rainfall can hinder their ability to find adequate food resources and cause nest colony abandonment. BWWMA has had extensive hydrologic assessments and restoration projects since the 1980s. For more information on current hydrologic restoration activities on BWWMA, see the Hydrology discussion in [Section 2](#).

Wading birds benefit from a variety of foraging opportunities within their range. While not dependent on actively-managed natural communities, wading birds benefit from the application of prescribed fire in wetland habitats, efforts to control invasive exotic plants, and the positive influence on water quality provided by conservation lands. Where possible, allow fire to burn across marshes and wetlands to decrease shrub encroachment. If nesting colonies are found on the area, managers will provide appropriate protection during land management activities ([Section 4.3.16](#)) and document their locations ([Section 5.2.4](#)).

The goal for BWWMA is to provide suitable habitat for wading birds that will allow individuals using the area to function as part of the regional population. Ongoing hydrologic restoration and the large amount of potential habitat within the region increases the potential that wading birds will continue to occupy BWWMA. By maintaining suitable foraging and roosting habitat for wading birds, staff will fulfill BWWMA's role for this species group.

3.2.18: Florida Black Bear

Florida black bears are rare on BWWMA, and the area is approximately 6 miles from the nearest black bear secondary range. In 2012, a single bear was seen on the south end of Webb Lake Road and on the Yucca Pens Unit. Nuisance bear issues are rare in the immediate vicinity of BWWMA, but in recent years, FWC has received numerous nuisance bear calls in Fort Myers, Sanibel, and rural residences to the south of BWWMA.

The Florida black bear is a wide-ranging species capable of significant dispersal, typically by males. Because females tend to establish a home range near where they were born, this species is slow to colonize new breeding territory and tends to grow out from existing populations. Home range sizes vary according to resource availability and the level of habitat fragmentation on the landscape. A mosaic of flatwoods, swamps, scrub oak ridges, bayheads, and hammocks provides adequate den sites, diverse food sources, and cover for traveling bears.

This species triggers 2 of 6 prioritization parameters ([priorities table](#)). In June 2012, the FWC approved a [Black Bear Management Plan](#) and removed the species from the Threatened list. The management plan is intended to guide continued recovery of this species. The management plan divides the state into geographic areas referred to as Bear Management Units (BMUs). BWWMA is on the boundary of the South BMU and the South Central BMU. The South BMU contains the Big Cypress bear subpopulation and the South Central BMU contains the Glades/Highlands bear subpopulation. Within these BMUs, BWWMA lies just north of the secondary range for the Big Cypress subpopulation and west-southwest of the Glades Highlands subpopulation. BWWMA and surrounding conservation lands provide a travel corridor for bears moving between these subpopulations.

Models indicate 40,253 acres of potential habitat for Florida black bears on Webb and 12,666 acres on the Yucca Pens Unit. An additional 55,714 acres are available on BRP and HCWEA. Most of the potential habitat on BWWMA is mesic or wet flatwoods. Land management on Webb is primarily intended to improve suitability for the red-cockaded woodpecker and northern bobwhite, which is conducive to adequate conditions for bear dens. Habitat condition on the Yucca Pens Unit, however, is more suitable for bears, though restoration could reduce suitability of potential bear den sites on the area. BWWMA has been identified as a potential key linkage between the bear subpopulations in the South BMU and the South Central BMU and has a role in providing a travel corridor. Even though BWWMA is managed for species that require open habitat, there will continue to be

overgrown areas and riparian corridors that allow BWWMA to provide forage and travel habitat for bears. As such, there is a moderate opportunity to support the regional bear populations on BWWMA.

Land management activities that promote a mosaic of vegetative structure across the landscape will provide forage and cover for bears; however, land management activities such as frequent prescribed fire can decrease denning habitat or cause direct mortality to denning bears. The potential establishment of a Florida panther SMA will also benefit Florida black bears ([Section 3.2.20](#)). See [Section 4.3.17](#) for more information on land management.

Monitoring of the Florida black bear population is best done at the landscape level. Incidental observations of female bears with cubs as well as bears outside the known range should be documented and reported ([Section 5.2.4](#)).

The goal is to maintain a travel corridor for bears moving between the South BMU and the South Central BMU and to allow individuals using BWWMA to persist in the regional population. The amount of potential habitat on BWWMA and adjacent conservation areas increases the likelihood that bears will persist in the region.

3.2.19: Florida Bonneted Bat

BWWMA contains the only known roosts of Florida bonneted bats on public lands. In 2006, the FBC documented Florida bonneted bats around BWWMA and BRP while conducting acoustic surveys. The surveys were part of a USFWS-funded study to delineate the Florida bonneted bat's range. FWC followed up with additional surveys in 2008, documenting Florida bonneted bats in 3 locations on BWWMA.

Bonneted bats have been documented acoustically at several sites across south Florida, including natural, urban, and rural settings. Due to the small number of observations, there is not enough information to determine habitat preferences or make management recommendations. The Florida bonneted bat is not a WHCNIFL focal species and potential habitat models are not available for this species. The FWC has developed a [Species Action Plan](#) for the Florida bonneted bat, with the recommendation that it be maintained as a Threatened species in Florida. The Plan also recommends research into life history traits (such as habitat use and reproduction) and management techniques for the Florida bonneted bat. In 2012, the USFWS released a proposed listing rule for the Florida bonneted bat to add it to the list of species protected by the Endangered Species Act. The USFWS formally listed Florida bonneted bat as Endangered in the October 2, 2013 Federal Register.

Species management activities on BWWMA consist of maintaining a suite of bat houses for use by Florida bonneted bats and other bat species. In 2007, FWC installed 15 bat houses on BWWMA consisting of 1-2 bat houses mounted on a utility pole; creating 8 total roosts for bonneted bats. To date, Florida bonneted bats have been documented using 5 of the roosts. In 2012, staff installed 5 additional houses near existing roosts to provide more

roosting habitat for Florida bonneted bats. While there may be more opportunities to install additional Florida bonneted bat houses, it is not known what influence artificial roosts have on the population or on habitat use by the species. Staff will continue to maintain the current suite of bat houses on BWWMA ([Section 5.1.3](#)).

Florida bonneted bats on BWWMA are monitored by counting bats emerging from bat houses in the evening (emergence counts). In 2012, FWC purchased an infrared camera system and started conducting simultaneous emergence counts (attempting to count at each occupied house on the same night) to estimate the total number of individuals using bat houses. A count in March 2014 found 64 bats in 3 roosts. FWC plans to conduct at least 4 simultaneous counts annually on BWWMA, one per season ([Section 5.2.3](#)).

In 2012, FWC developed a Bat House Occupancy Assessment protocol and began using it on WEA/WMAAs across the state. The purpose of this protocol is to estimate the number of bats using houses and to track changes in bat house occupancy between seasons. This protocol should be implemented on BWWMA ([Section 5.2.3](#)) in conjunction with simultaneous emergence counts. According to the protocol, bat houses should be checked before and after land management activity. If juveniles are observed in bonneted bat houses prior to land management, it may be necessary to delay activity until the young reach maturity. In 2012, a State Wildlife Grant (SWG) was awarded to University of Florida researchers to develop a survey protocol for the Florida bonneted bat and identify habitats important for roosting and foraging. A portion of this research will be conducted on BWWMA and the resulting recommendations should be incorporated into ongoing management.

Any dead bats found on BWWMA should be collected and sent for necropsy to determine cause of death. Understanding causes of mortality is important in the event of a disease event, and collecting bat carcasses assists in statewide bat mortality research. If dead bats are found, staff will place the carcasses on ice and enter the data on the dead bats into FWC's Bat Mortality Database (<http://myfwc.com/wildlifehabitats/health-disease/white-nose-syndrome/bat-mortality/>). Staff will coordinate with the database manager to determine if a carcass should be immediately sent for necropsy or if it can be frozen and sent at a later date ([Section 6.1.4](#)).

FWC supports Florida bonneted bats on BWWMA and is involved in conservation and research efforts across the range of the species. In 2012, a Florida Bonneted Bat Working Group was formed to address the conservation needs of this species. Members include the FWC, USFWS, National Park Service, ZooMiami, FBC, and other private individuals. FWC involvement with this group includes BWWMA staff, the Regional Conservation Biologist, the Mammal Taxa Coordinator, and FWRI ([Section 6.9](#)).

Because BWWMA is the only public land with known Florida bonneted bat roosts, people wishing to record echolocation calls or gather other passive data on occupied bat houses frequently seek access to BWWMA. In the past, FWC granted this type of access to BWWMA via Special Use Permits, which allowed for access to closed areas and provided

conditions, where applicable, for conducting activities. However, due to the rarity of this species and recent federal listing, the demand for access will continue to increase, as will the risk of disturbing the bats. To meet staff's desire for a more efficient process for handling requests, and to minimize the risk of disturbance, a [scientific collection permit](#) will now be required to collect Florida bonneted bat data on BWWMA, unless such work is done in conjunction with ongoing FWC activities and/or staff. FWC's Mammal Taxa Coordinator, Species Conservation Planning Biologists, internal species experts, and regional and local staff will review applications for these permits ([Section 6.1.1](#)).

In 2012, the USFWS contracted with EcoDogs, an organization that trains dogs to detect wildlife by scent. The purpose was to determine if a dog could detect a natural Florida bonneted bat roost. Guano collected from occupied bat houses by BWWMA staff was provided for use in training the dogs. In January and February 2013, EcoDogs and the USFWS began searching for natural roosts, both on BWWMA and elsewhere throughout south Florida. The dogs identified 2 snags and other natural cavities on BWWMA that may have been used by Florida bonneted bats. FWC will follow up on the results of those searches on BWWMA as they become available.

Land management considerations for the Florida bonneted bat are not very well known and will be better understood with further research. Staff at BWWMA has placed bat houses in areas with little need for vegetation management (around ponds and wet areas), minimizing the risk of disturbance around the roost. Further land management considerations can be found in [Section 4.3.18](#).

The area goal is to continue to support Florida bonneted bats on BWWMA. By maintaining artificial roosts and retaining large snags during timber activities, management at BWWMA has the potential to support use by Florida bonneted bats. However, habitat preferences for this species are not well understood. The results from ongoing USFWS and SWG research should provide insight into actions that can benefit the Florida bonneted bat. Once these studies are complete, BWWMA staff should incorporate the resulting management and monitoring recommendations into ongoing activities that include bat houses, simultaneous emergence counts, and the Bat House Occupancy Assessment. These actions will allow BWWMA to continue providing habitat for Florida bonneted bats and help support the state-wide population. The measurable objectives are:

- 1) Implement the FWC Bat House Occupancy Assessment protocol in 2014.
- 2) Following existing protocol, conduct at least 4 simultaneous emergence counts per year on roosts occupied by Florida bonneted bats.
- 3) By the end of 2018, incorporate the applicable results of the USFWS and SWG research into ongoing actions on BWWMA.
- 4) Continue to be involved in the Florida Bonneted Bat Working Group.

3.2.20: Florida Panther

Florida panthers are rare on BWWMA, as the area falls to the north of the primary, secondary, and dispersal zones for this species. BRP is within a priority expansion area for panthers, and telemetry studies have found panthers on both BRP and BWWMA, though more commonly on BRP. Florida panthers use a variety of habitats that generally consist of forested uplands and wetlands, interspersed with open habitats such as marshes, wet and dry prairies, old fields, pastures, and agricultural land. Several studies found a proportionally higher use of forested habitat types by Florida panthers, although non-forested habitats are important for hunting prey species and serve as travel corridors between resting sites.

This species triggers 4 of the 6 statewide prioritization parameters ([priorities table](#)) and the USFWS lists the Florida panther as federally Endangered. This species is a high statewide priority. The [USFWS Panther Recovery Plan](#) identifies a recovery objective that a breeding population is established north of the Caloosahatchee River. An assessment from the [Babcock Ranch Regional Connectivity Study](#) determined that the network of conservation lands that includes BWWMA is the most appropriate to expanding the breeding population north of Caloosahatchee River. The study also determined that BWWMA and BRP lie along a potential corridor for panthers moving between the Big Cypress National Park to the south and the Myakka conservation complex to the northwest. BWWMA has a high potential to provide suitable habitat for dispersing panthers and will contribute to the recovery goal for this federally-listed species.

Models indicate 28,943 acres of potential habitat for the Florida panther within current natural communities on Webb and 8,165 acres on the Yucca Pens Unit. An additional 32,780 acres are available on BRP and HCWEA. The [USFWS Panther Recovery Plan](#) indicates that a minimum of 4,800–12,000 square miles (3,072,000–7,680,000 acres) is necessary to sustain a population of Florida panther. While BWWMA cannot sustain a population of panthers in isolation, the area currently provides habitat for panthers moving across the landscape and has potential to support the regional panther population if it expands north of the Caloosahatchee River.

Habitat condition on the Yucca Pens Unit is more suitable for panthers than on Webb, although the Yucca Pens Unit is partially isolated by I-75 and surrounding development. Ultimately, restoration on the Yucca Pens Unit could reduce levels of cover in potential resting and denning sites, and decrease the suitability of panther habitat. In 2010, FWC staff discussed the habitat needs of panthers on BWWMA and concluded that low levels of dense, overhead cover are a primary concern. Limited overhead cover may affect the panthers' ability to cache prey, and reduce areas used for denning. An analysis of maternity den sites to the south of BWWMA identified that vegetation cover within preferred resting areas tended to be dome-shaped and contained a higher proportion of palmetto and gallberry (*Ilex sp.*) than outside of den sites.

Land management for this species should focus on creating a mosaic of habitats that

include patches of dense vegetation for resting and denning, interspersed with open areas for stalking prey. Vertical vegetation structure in forested areas is critical to this species and management actions should enhance and or retain pockets of dense midstory and overstory vegetation. Land management on Webb is primarily intended to improve suitability for management-dependent species such as the red-cockaded woodpecker and northern bobwhite. This management regime promotes a relatively open landscape, but patches of denser cover remain and can provide suitable habitat for panthers. A SMA may be necessary to identify specific areas where suitable cover should be maintained, but the extent and juxtaposition of cover and denning habitat on BWWMA is currently unknown. An assessment into the condition of available habitat on BWWMA would determine if there is a need for directed management actions ([Section 4.1](#)).

Local and regional staff will work with FWC panther biologists to assess the extent and condition of panther habitat on BWWMA. The main purpose of the assessment is to determine if there is suitable resting, caching, and potential den sites for panthers on Webb. Staff will use aerial maps and local knowledge to identify sites that appear suitable for these uses. Staff will then ground truth these sites and compare cover data on-site to cover data from known maternity sites in other areas of the state. Staff will then look at the juxtaposition of available cover on Webb to determine habitat suitability at the landscape level. If staff determine that there is not suitable cover to support panthers on BWWMA, staff will establish an SMA to document areas where management can improve cover for denning and caching prey. The purpose of the SMA will be to ensure creation or retention of suitable panther cover at appropriate locations that will allow BWWMA to fulfill its role in the conservation of this species. See [Section 4.3.18](#) for more information on land management.

As FWC's panther management team closely monitors populations throughout the state, no additional systematic monitoring is necessary. [Section 5.2.4](#) describes the opportunistic monitoring recommended for this species. The goal is to provide suitable habitat for Florida panthers, allowing individuals using BWWMA to persist as a part of the regional population. Until breeding females are documented north of the Caloosahatchee River, management on BWWMA will continue to be focused on supporting dispersing males. The measurable objective is to:

- 1) By the end of 2015, determine the method for evaluating the amount of cover available for panthers on BWWMA and assess the suitability of available habitat for panther denning. If necessary, establish an SMA to manage panther habitat.

3.2.21: Sherman's Fox Squirrel

Sherman's fox squirrels are present on BWWMA, with occurrences more common on Webb than the Yucca Pens Unit. A 2007-08 FNAI survey on BRP found that fox squirrels were commonly using mesic flatwoods, as well as improved or semi-improved pastures.

BWWMA is near the southwestern extent of the Sherman's fox squirrel range, and contains stands of natural slash pine, rather than longleaf.

The Sherman's fox squirrel is an FWC-listed species of special concern (according to the [Species Action Plan](#)) and triggers 4 of 6 prioritization parameters ([priorities table](#)). Suitable habitat for Sherman's fox squirrel includes mature longleaf pine sandhills or flatwoods with a mixture of mature pines and oaks, as well as a sparse to moderate shrub layer. Fox squirrels often use large oaks for nest sites and for daytime refugia. Acorns provide a major part of the species' diet and seed-bearing cones of mature longleaf pines are an important energy-rich food source, particularly during summer. A mosaic of habitat conditions across the landscape ensures a year-round supply of forage that varies seasonally.

Models indicate 38,640 acres of potential habitat within natural communities on Webb and 12,261 acres on the Yucca Pens Unit. An additional 54,575 acres are available on BRP and HCWEA. Habitat on Webb is currently suitable for fox squirrel use. Habitat on the Yucca Pens Unit may be less suitable, though conditions will improve with planned restoration and maintenance. The fox squirrel is a wide-ranging species and the literature suggests 2,000-9,000 acres of suitable habitat are required to support a population. Given the large amount of potential habitat and frequency of observations on Webb, the area may support a viable population and likely plays a significant role in supporting the regional fox squirrel population. The Yucca Pens Unit can contribute to the regional population, but not at the same level as Webb.

Management actions that maintain or enhance habitat for fox squirrels include prescribed fire, mechanical actions that aid in restoring natural community structure, and timber management that results in open, mature pine forests with an oak component. Fox squirrels are occasionally taken during small game hunts on BWWMA, though not in numbers that could be considered significant. Staff should post signage at the check station educating hunters on the difference between fox and gray squirrels to reduce accidental take. Because this species naturally occurs at low densities and can be difficult to detect, no specific monitoring aside from opportunistic observation is recommended. Staff should also document the presence of young or nests on Webb and any sighting on the Yucca Pens Unit ([Section 5.2.4](#)). If dead fox squirrels are found on BWWMA, they should be documented and reported to the University of Florida to be used in a fox squirrel research project.

The goal is to support a population of Sherman's fox squirrels on BWWMA. Staff can increase and maintain suitable habitat for Sherman's fox squirrel by continuing a regular prescribed fire rotation and maintaining occasional oaks to provide nesting cavities and acorns. By maintaining suitable habitat conditions, BWWMA can support a population of Sherman fox squirrels and fulfill its role for the species within the region.

3.2.22: Limited Opportunity Species

Two focal species, the Florida grasshopper sparrow and the Florida scrub-jay were modeled (using statewide data) to have potential habitat on BWWMA but lack reasonable opportunity for management on the area. Opportunistic observations of these species should be documented ([Section 5.2.4](#)). If the Florida grasshopper sparrow or the Florida scrub-jay are documented with increasing regularity, BWWMA's role in their conservation and recovery should be re-visited. As limited opportunity species, there is no need for SMAs, specific monitoring, goals, or measurable objectives.

Florida Grasshopper Sparrow – Despite containing adequate levels of suitable habitat, BWWMA is outside the known range of this species, and has no recorded occurrences of Florida grasshopper sparrows. Populations are known to only exist in Polk, Osceola, Okeechobee, and Highlands counties. FNAI surveys in 2007-08 at BRP did not detect Florida grasshopper sparrows. There are confirmed sightings at Okaloacoochee Slough WMA and Dinner Island Ranch WMA since 2008, approximately 40 miles southeast of BWWMA. However, this is the species experiencing significant declines in the few locations in which it is known to occur. The absence of nearby source populations is the factor limiting Florida grasshopper sparrow occurrences on BWWMA, therefore there is limited opportunity for management.

The Florida grasshopper sparrow is federally listed as Endangered, and this species triggers all 6 of the statewide prioritization parameters ([priorities table](#)). Models indicate 9,314 acres of potential grasshopper sparrow habitat within natural communities on Webb and no potential habitat on the Yucca Pens Unit. An additional 2,097 acres of potential habitat are available on BRP. Habitat for the grasshopper sparrow contains large treeless grasslands maintained with frequent fire. Although the primary habitat for this species is dry prairie, the Florida grasshopper sparrow utilizes pasture habitat only when in close proximity to suitable dry prairie habitat. The literature suggests 593-3,330 acres are necessary to support at least 50 pairs, and provide some level of persistence. However, some literature suggest >4,000 acres are necessary to support a viable population. There is enough potential habitat to support a population of Florida grasshopper sparrows on BWWMA should they become established. If the species is documented on the area during hobwhite covey counts or Breeding Bird Surveys, this assessment should be revised.

Florida Scrub-Jay - Florida scrub-jays are rare on BWWMA. The last record was in 2009 on the northwest part of Webb. The observation was incidental, and the birds did not remain on the area. Optimal habitat for Florida scrub-jays is oak-dominated scrub and scrubby flatwoods with the shrub layer 4 and 5.5 feet tall and 10-50% open ground. Area-specific potential habitat models indicate no potential scrub-jay habitat on BWWMA;

however, 167 acres are available on BRP and 111 acres on HCWEA. Given that no scrub-jay habitat exists on BWWMA, the area has a limited role in the conservation of this species. Occasional use may occur, which is likely from birds moving between off-site areas with scrub or scrubby flatwoods.

The scrub-jay is listed as Threatened at the federal level, and triggers all 6 prioritization parameters ([priorities table](#)). Found in both coastal and ancient scrub-type habitats in peninsular Florida, scrub-jays rely heavily on fire to maintain optimal foraging and breeding conditions in scrub. Ongoing management will maintain vegetation structure suitable for short-term use and dispersal habitat.

3.3: Other Listed and Locally Important Species

While natural community management focused on a set of focal species provides benefits to a host of species reliant upon these natural communities, species that are imperiled sometimes require specific attention. Further, subsection 253.034(5) of the Florida Statutes (F.S.) requires all land management plans to include an analysis of the property to determine if significant natural resources, including listed species, occur on the property. If significant natural resources occur, the plan shall contain management strategies to protect the resources. The Florida Forever Act (s. 259.105, F.S.) adds that all State lands that have imperiled species habitat shall include restoration, enhancement, management, and repopulation of such habitats as a consideration in the management plan. In this subsection, we discuss listed or locally important species that are not PLCP focal species.

It is possible other imperiled species occur on BWWMA, and if encountered, staff will document these encounters. Florida's imperiled species are adapted to natural communities and should continue to benefit from FWC's ongoing or planned ecological management that aims to restore natural community structure and function. Under FWC's ecological management, these species have a higher probability of persistence than in the absence of this management.

3.3.1: Other Focal or Imperiled Wildlife

In addition to the listed species discussed in [Section 3.2](#), the American alligator (*Alligator mississippiensis*) and eastern indigo snake (*Drymarchon couperi*) are the only other listed species known to occur on BWWMA. The short-tailed hawk (*Buteo brachyurus*) is a focal species that was not modeled to have potential habitat on BWWMA, but has been documented on the area.

American Alligator - The alligator is federally listed due to similarity of appearance with the American crocodile (*Crocodylus acutus*), which is federally listed as threatened.

Ongoing management to maintain healthy wetland habitats should ensure the continued existence of the alligator on BWWMA.

Eastern Indigo Snake – The eastern indigo snake is federally listed and known to occur in the landscape surrounding BWWMA. Eastern indigo snakes have large home ranges and are vulnerable to habitat fragmentation, which likely impedes movement of this species between geographically separated areas. Habitat fragmentation can cause the loss of travel corridors between areas of suitable habitat within a home range, and can increase mortality of indigo snakes in areas with more roads. Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical treatments that aid in restoring natural community structure and function. Stumps and other coarse woody debris should be retained during land management activities ([Section 4.3.2](#)). If contractors are used to accomplish land management objectives, they should be educated in what to do if they encounter an eastern indigo snake. Opportunistic monitoring is recommended ([Section 5.2.4](#)). Planned and ongoing management appear compatible with the needs of the indigo snake. The regular application of prescribed fire in conjunction with management favoring mature native pine stands should help ensure the long-term protection of this species on BWWMA.

Short-Tailed Hawk – The short-tailed hawk is a focal species that has been documented on BRP and is known to nest near HCWEA. Habitat models did not accurately detect the potential for this species on BWWMA. While this species is not considered management dependent, ongoing management to maintain open flatwoods and ecotones should provide foraging habitat for this species on BWWMA. Opportunistic monitoring is recommended ([Section 5.2.4](#)). The regular application of prescribed fire and actions to reduce invasive exotic plants, in conjunction with management favoring mature native pine stands, should help ensure the long-term protection of this species on BWWMA.

3.3.2: Rare Plants

While there has been no formal rare plant inventory on BWWMA, there are at least 8 imperiled plant species known to occur on BWWMA. The beautiful pawpaw (white squirrel-banana; *Deeringothammus pulchellus*) is a federally Endangered species. The Florida Department of Agriculture and Consumer Services lists the giant airplant (giant wild pine: *Tillandsia utriculata*) and the many-flowered grass-pink (*Calopogon multiflorus*) as Endangered, and the Catesby's lily (pine lily; *Lilium catesbaei*), long-lip ladiestresses (*Spiranthes longilabris*), blue-flowered butterwort (*Pinguicula caerulea*), and yellow-flowered butterwort (*P. lutea*) as threatened. While not state-listed, the very rare, endemic smallcup spiderlily (*Hymenocallis punta-gordensis*) occurs on BWWMA and should be monitored appropriately. All 8 species of rare plants have been documented on Webb; long-

lip ladiestresses is the only rare plant documented to occur on the Yucca Pens Unit. The protections afforded plants by existing on conservation lands, in conjunction with exotic plant removal and prescribed fire, will continue to maintain habitat for these and other rare plants. As such, these species should persist on BWWMA.

While planned management is compatible with the needs of most imperiled plant species, contracting for a rare plant inventory is recommended if additional funding becomes available. The measurable objective is to:

- 1) Within the life of this Strategy, seek funding to contract for the completion of a rare plant inventory on BWWMA.

Beautiful Pawpaw – The beautiful pawpaw has been documented at several locations on BWWMA. This species, which occurs in flatwoods and wet and dry prairie, requires frequent prescribed fire. The USFWS completed a [5-year review](#) for this species in 2009, and the species recovery plan is included in the [South Florida Multi-Species recovery plan](#).

Giant Airplant – The giant airplant is also found on BRP and prefers bright, exposed areas in swamps, hammocks, mesic flatwoods, and along the periphery of basin marshes. It also occurs in improved pastures. The Mexican bromeliad weevil is a threat to this species. The Southwest Florida Cooperative Invasive Species Management Area is considering releasing weevil predators to reduce this threat.

Many-flowered Grasspink – The many-flowered grasspink is an orchid that also occurs on BRP. This species is rare due to fire exclusion and habitat conversion. A prescribed fire return interval in flatwoods of 2-3 years is considered beneficial. Soil and hydrologic disturbance negatively affect this species; therefore, avoid roller-chopping in areas of known occurrences.

Catesby's Lily – Catesby's lily also occurs on BRP, and prefers mesic and wet flatwoods, and occasionally dry prairie. Habitat loss is a major threat, as is fire exclusion and habitat disturbance. A prescribed fire return interval of 2-3 years is considered beneficial.

Blue-flowered Butterwort – Blue-flowered butterwort occurs on BWWMA but was not found on BRP. This species grows along the edges of wetlands and can be disturbed if firelines are maintained around wetland perimeters. This species suffers in the absence of fire, and fires should be allowed to burn into wetlands where this species occurs.

Yellow-Flowered Butterwort – Yellow-flowered butterwort occurs on BRP and is commonly found in mesic flatwoods and along ecotones with wet flatwoods and transition areas. Applying fire during the growing season and protecting soil hydrology are beneficial actions for this species.

Section 4: Land Management Actions and Considerations

Models identified potential habitat for 21 focal species on the area ([Section 3.1](#)); however, not all of these species have the same level of management opportunity or need ([Section 3.2](#)). The FWC's natural community-based management, which emphasizes frequent growing season prescribed fire, will promote the habitat conditions necessary for most of these species, without the need for further strategic management actions. Staff may designate Strategic Management Areas (SMAs) when actions over and above ongoing natural community management are required in a specific location ([Section 4.1](#)). In addition, to ensure natural community management addresses the needs of these focal species, we evaluate the OBVM Desired Future Conditions (DFCs) for natural communities ([Section 4.2](#)). [Section 4.3](#) provides recommendations for species that need specific protective measures or land management considerations to ensure their continued use of the property.

4.1: Strategic Management Areas

The intent on BWWMA is to apply management actions that maintain intact natural communities in good condition and restore degraded or altered natural communities to a condition that will better suit focal and listed species. However, SMAs focus management actions on MUs with the highest possibility of success, and or MUs most critical for the conservation of a species on the WMA. Staff designates SMAs to achieve at least one of the following:

- Identify the area in which to apply specific land or species management that creates the highest probability for persistence and conservation of a species or suite of species. These specific actions should aid in restoring, enhancing, or maintaining the habitat or population.
- Identify an area in which to focus specific land or species management actions for the best chance of success, when there is more restoration and enhancement than can be accomplished in short order on the WMA. This might be the first or next step in a sequential series of management actions that will increase the likelihood of occupation and or persistence of a specific species.
- Identify an area that is so critical to the persistence of a species on the WMA that it warrants special designation to ensure protection against negative alteration.
- Identify areas that are critical for research or monitoring.
- Recommend MU-specific natural community DFCs that differ from the DFCs in the natural community area-wide, when this is necessary to benefit a specific species.

The WCPR workshop gave participants the opportunity to evaluate if there was the need for SMAs to meet the needs of focal species. Workshop participants agreed that

planned and ongoing management actions across BWWMA will meet the needs of the majority of focal species; therefore, they did not designate any SMAs through the workshop process. However, the measurable objective for the Florida panther is to evaluate the current amount of cover available for panthers and establish an SMA to protect panther habitat, if appropriate. Further, during the development of the Strategy, the need for a Red-Cockaded Woodpecker Connectivity SMA was identified to incorporate management to maintain and improve connectivity within red-cockaded woodpecker habitat on Webb.

Section 4.1.1: Red-Cockaded Woodpecker Connectivity SMA

The purpose of this SMA is to identify habitat on Webb that can enhance connectivity for red-cockaded woodpeckers. Staff can maintain pines and increase pines within the SMA as a way to improve habitat conditions for the red-cockaded woodpecker without negatively altering the integrity of the natural communities. Planting, natural recruitment, and land management actions that encourage recruitment can improve areas where suitable woodpecker trees are absent. However, this is not intended as a management action across all areas of BWWMA, only in areas where it will improve movement between red-cockaded woodpecker clusters. Transition zones between prairies and mesic flatwoods are currently supporting periodic woodpecker use and pine regeneration in these areas will increase the potential for establishing new clusters. The SMA will include portions of prairies, flatwoods, and prairie-flatwoods transition zones that are adjacent to red-cockaded woodpecker clusters.

Because some areas mapped as wet and dry prairie on Webb were historically flatwoods, these areas can be restored to a suitable condition for red-cockaded woodpecker habitat. FNAI is currently re-mapping natural communities on BWWMA, and will likely classify areas previously considered prairie as flatwoods. Staff will delineate the SMA after the natural community re-mapping. The RCWMAG's revision of the BWWMA Red-Cockaded Woodpecker Management Plan should incorporate recommendations from the Red-Cockaded Woodpecker Connectivity SMA in future management actions.

SMA Goal: Enhance habitat connectivity for red-cockaded woodpeckers on BWWMA.

SMA Objective 1: Identify areas on the Webb tract where pine density should be increased or maintained.

SMA Objective 2: Apply management actions outlined in the revised BWWMA Red-Cockaded Management Plan for improving habitat connectivity on Webb.

Strategy: The strategy for this SMA is to first identify natural communities that meet the criteria for inclusion. When FNAI's natural community re-mapping information becomes available, staff will identify areas of dry prairie, wet prairie, flatwoods, and prairie-flatwoods

transition zones where pine restoration would benefit red-cockaded woodpecker connectivity. These areas will be identified based upon their proximity to active woodpecker clusters and designated as part of the SMA.

Prairies, flatwoods, and prairie-flatwoods transition zones within the SMA will be managed to increase pine densities and improve red-cockaded woodpecker habitat. Areas mapped as flatwoods will be restored to pine densities that could support active clusters. Pine recruitment in wet and dry prairie will also enhance suitable woodpecker habitat between active clusters without altering the integrity of these natural communities. FNAI reference site DFCs should be adjusted for portions of wet and dry prairie within the SMA to be flexible to pine growth and regeneration ([Section 4.2.1](#)). The RCWMAG will include specific actions for improving habitat connectivity in the revised BWWMA Red-Cockaded Woodpecker Management Plan

4.2: Objective-Based Vegetation Management Considerations

OBVM is an approach to land management that emphasizes maintaining and restoring natural plant communities towards pre-determined desired conditions. The OBVM DFCs ([Table 2](#)) target a range in values for various habitat attributes within actively managed communities. However, if a focal species requires a more restricted range in habitat attributes than is reflected in the area-wide DFCs, or depends on an attribute that is not currently monitored on BWWMA, we may recommend adjusting the DFC range or adding the attribute. The workshop gave participants the opportunity to evaluate if the current DFCs meet the needs of focal species and if not, to suggest modifications. The following are common reasons to modify DFCs:

- To obtain maximum habitat suitability for a species that requires a more restricted range of DFC values than the current DFC values.
- To benefit a particular species in specific MUs; typically when we have designated a SMA that requires a change in natural community DFCs only within the SMA and not in the natural community area-wide.
- To add an attribute that was not previously monitored.

Due to program review, the data collection protocols for OBVM have changed since the BWWMA OBVM workshop. Additionally, the BWWMA OBVM workshop occurred prior to the identification of reference sites, which are areas identified by FNAI as representing the highest quality examples of natural communities in the State. Reference site attribute assessments have resulted in changes to the range of OBVM attribute values. At the WCPR workshop, BWWMA and regional staff reviewed the reference site values to determine if they are appropriate for BWWMA. Table 2 reflects the FNAI reference site DFC's for 4 actively managed natural communities on BWWMA.

Table 2A. FNAI Reference Site Desired Future Conditions for specific vegetative attributes in Mesic Flatwoods at BWWMA.

COMMUNITY	ATTRIBUTE	UNITS	FNAI Reference Site DFCs
Mesic Flatwoods	Basal Area of Pine	ft ² /acre	10-50
	Non-Pine Stem Density > 4in DBH	count/7m radius	0
	Subcanopy Stem Density 2-4in DBH	average count/4m quadrat	0-1
	Shrub Stem Density > 1m	average count/4m quadrat	0-1
	Maximum Shrub Stem DBH	average maximum DBH in inches	0-0.5
	Average Maximum Shrub Height	average maximum height in ft	0-2
	Shrub Cover < 1m	average % cover/4m quadrat	0-25
	Serenoa Petiole Density > 1m	average count/4m quadrat	0
	Serenoa Cover < 1m	average % cover/4m quadrat	10-25
	Herbaceous Cover	average % cover/4m quadrat	25-100
	Bare Ground Cover %	average % cover/4m quadrat	0-10
	Graminoid Cover %	average % cover/4m quadrat	10-100

Table 2B. FNAI Reference Site Desired Future Conditions for specific vegetative attributes in Wet Flatwoods at BWWMA.

COMMUNITY	ATTRIBUTE	UNITS	FNAI Reference Site DFCs
Wet Flatwoods	Basal Area of Pine	ft ² /acre	10-50
	Non-Pine Stem Density > 4in DBH	count/7m radius	0
	Subcanopy Stem Density 2-4in DBH	average count/4m quadrat	0-1
	Shrub Stem Density > 1m	average count/4m quadrat	0-0.5
	Maximum Shrub Stem DBH	average maximum DBH in inches	0-0.5
	Average Maximum Shrub Height	average maximum height in ft	0-3
	Shrub Cover < 1m	average % cover/4m quadrat	0-10
	Serenoa Petiole Density > 1m	average count/4m quadrat	0
	Serenoa Cover < 1m	average % cover/4m quadrat	0-10
	Herbaceous Cover	average % cover/4m quadrat	25-100
	Pine regeneration count >1ft to < 3ft	count/7m radius	-
	Pine regeneration count >3ft to ≤10ft	count/7m radius	-
	Bare Ground Cover %	average % cover/4m quadrat	0-2
	Graminoid Cover %	average % cover/4m quadrat	10-100

Table 2C. FNAI Reference Site Desired Future Conditions for specific vegetative attributes in Dry Prairie at BWWMA.

COMMUNITY	ATTRIBUTE	UNITS	FNAI Reference Site DFCs	DFCs within Red-Cockaded Woodpecker Connectivity SMA
Dry Prairie	Basal Area of Pine	ft ² /acre	Not sampled	0-5
	Non-Pine Stem Density > 4in DBH	count/7m radius	Not sampled	-
	Pine stem density >6" height	count/7m radius	-	-
	Subcanopy Stem Density 2-4in DBH	average count/4m quadrat	0	0
	Shrub Stem Density > 1m	average count/4m quadrat	0	0
	Maximum Shrub Stem DBH	average maximum DBH in inches	0	0
	Average Maximum Shrub Height	average maximum height in ft	0-2	0-2
	Shrub Cover < 1m	average % cover/4m quadrat	10-40	10-40
	Serenoa Petiole Density > 1m	average count/4m quadrat	0	0
	Serenoa Cover < 1m	average % cover/4m quadrat	5-20	5-20
	Herbaceous Cover	average % cover/4m quadrat	10-100	10-100
	Pine regeneration count >1ft to < 3ft	count/7m radius	0	0-1
	Pine regeneration count >3ft to <10ft	count/7m radius	0	0-1
	Bare Ground Cover %	average % cover/4m quadrat	1-10	1-10
	Graminoid Cover %	average % cover/4m quadrat	10-100	10-100

Table 2D. FNAI Reference Site Desired Future Conditions for specific vegetative attributes in Wet Prairie at BWWMA.

COMMUNITY	ATTRIBUTE	UNITS	FNAI Reference Site DFCs	DFCs within Red-Cockaded Woodpecker Connectivity SMA
Wet Prairie	Basal Area of Pine	ft ² /acre	Not sampled in prairies	0-5
	Non-Pine Stem Density > 4in DBH	count/7m radius	Not sampled in prairies	-
	Pine stem density >6" height	count/7m radius	-	-
	Subcanopy Stem Density 2-4in DBH	average count/4m quadrat	0-1	0-1
	Shrub Stem Density > 1m	average count/4m quadrat	0-1	0-1

COMMUNITY	ATTRIBUTE	UNITS	FNAI Reference Site DFCs	DFCs within Red-Cockaded Woodpecker Connectivity SMA
Wet Prairie	Maximum Shrub Stem DBH	average maximum DBH in inches	0-0.25	0-0.25
	Average Maximum Shrub Height	average maximum height in ft	0-2	0-2
	Shrub Cover < 1m	average % cover/4m quadrat	0-5	0-5
	Serenoa Petiole Density > 1m	average count/4m quadrat	0	0
	Serenoa Cover < 1m	average % cover/4m quadrat	0-5	0-5
	Herbaceous Cover	average % cover/4m quadrat	75-100	75-100
	Pine regeneration count >1ft to < 3ft	count/7m radius	0	0-1
	Pine regeneration count >3ft to <10ft	count/7m radius	0	0-1
	Bare Ground Cover %	average % cover/4m quadrat	0-5	0-5
	Graminoid Cover %	average % cover/4m quadrat	25-100	25-100

4.2.1: Modifications to Desired Future Conditions for Vegetation Attributes

Dry Prairie

Basal Area of Pine (Sq ft per acre)

Within the Red-Cockaded Woodpecker Connectivity SMA: change from 0 sq ft per acre to 0-5 sq ft per acre.

Pine Regeneration (7m radius)

Within the Red-Cockaded Woodpecker Connectivity SMA: change from 0 per 7m radius to 0-1 per 7m radius.

Justification: Red-cockaded woodpeckers on BWWMA would benefit from increased habitat connectivity between active clusters. Some areas currently mapped as dry prairie on BWWMA contain scattered pines, which often occur with slight elevation or soil changes or along transition zones between prairie and adjacent pine flatwoods. Prairie-to-flatwoods transition zones have the potential to support red-cockaded woodpecker movement and can be included in an SMA to improve connectivity between woodpecker habitat ([Section 4.1.1](#)). It is appropriate to adjust DFC's for dry prairies within the SMA to allow for scattered pine trees and to be flexible if pine trees regenerate in dry prairie communities. Once the Red-Cockaded Woodpecker Connectivity SMA is delineated on BWWMA, dry prairies within the SMA should be managed to meet DFCs that include 0-5 sq ft per acre basal pine area, and pine regeneration of 0-1 per 7m radius.

Wet Prairie

Basal Area of Pine (Sq ft per acre)

Within the Red-Cockaded Woodpecker Connectivity SMA: change from 0 sq ft per acre to 0-5 sq ft per acre.

Pine Regeneration (7m radius)

Within the Red-Cockaded Woodpecker Connectivity SMA: change from 0 per 7m radius to 0-1 per 7m radius.

Justification: Red-cockaded woodpeckers on BWWMA would benefit from increased habitat connectivity between active clusters. Similar to dry prairie, some areas mapped as wet prairie on BWWMA contain scattered pines, which often occur with slight elevation or soil changes or along transition zones between prairie and adjacent pine flatwoods. Prairie-to-flatwoods transition zones have the potential to support red-cockaded woodpecker movement and can be included in an SMA to improve connectivity between woodpecker habitat ([Section 4.1.1](#)). It is appropriate to adjust DFC's for wet prairies within the SMA to allow for scattered pine trees and to be flexible if pine trees regenerate in wet prairie communities. Once the Red-Cockaded Woodpecker Connectivity SMA is delineated on BWWMA, wet prairies within the SMA should be managed to meet DFCs that include 0-5 sq ft per acre basal pine area, and pine regeneration of 0-1 per 7m radius.

4.3: Further Land Management Considerations

Most generalist or wide-ranging species will benefit from management that restores the structure and function of natural communities they use. However, specific management recommendations and precautions are necessary to ensure continued suitability of the area for some species. The following recommendations should help ensure BWWMA continues to fulfill its role in the conservation of these species.

4.3.1: Gopher Frog

Gopher frogs frequently move between wetland breeding ponds and adjacent uplands. Do not place new firebreaks or roads along wetland ecotones because they can alter or destroy the herbaceous component of pond margins preferred by this species and other amphibians. Wet-lining can be an alternative to mineral firebreaks around wetlands if necessary; however, it is preferable to allow fire to burn through the wetland. Use prescribed fire as the primary tool to remove shrubs and other thick vegetation from pond margins; use mechanical and chemical treatments sparingly to reduce effects on pond-breeding

amphibians. Because it is important to maintain potential breeding ponds in good condition, minimize soil disturbance within 500 yards of potential breeding ponds.

4.3.2: Florida Pine Snake

Large upland snakes such as the Florida pine snake are relatively wide-ranging and elusive. Ongoing land management activities will enhance the suitability of habitat for this species but also could be directly detrimental. When using heavy equipment during land management activities, it is important to avoid direct mortality, if possible. In general, avoid removing stumps when possible, and leave coarse woody debris and residual stumps intact to provide cover for these species. While it is acceptable to pile and burn excess logging slash if necessary, ensure some debris remains in the stand to provide cover for this species and check piles for the presence of pine snakes prior to burning. Creating brush piles can provide cover for this species if escape cover is lacking.

4.3.3: Gopher Tortoise

To minimize negative impacts to gopher tortoises in areas where they occur, when appropriate, mechanical treatments should be done during the season when this species is dormant. Gopher tortoises are generally less active and remain in burrows during the winter months; therefore, mechanical equipment used at this time will be less likely to crush or otherwise harm foraging tortoises. Because it is difficult for equipment operators to see hatchling tortoises, avoid mechanical treatments during months when hatchlings are most abundant (September-October) when practical. However, also consider how timing of the treatment will affect management results, because growing season treatments frequently are more successful in creating the diverse groundcover required by the gopher tortoise. Regardless of timing, make efforts to minimize impacts to known burrows, whether active, inactive, or abandoned.

4.3.4: American Swallow-Tailed Kite

Because swallow-tailed kites exhibit high nest site fidelity, protect known nest sites from disturbance and alteration, and retain all of the tallest pines in the area of nest sites. Maintaining a 330-foot protective buffer around active nests during nesting season should minimize the chance of disturbance. When possible, kite nesting areas should be managed to have a higher shrub height and density than surrounding areas as this may reduce the likelihood of nest predation. If kite activity is observed during nesting season, particularly if kites are observed carrying nesting material, mobbing, or congregating in groups of 3 or more, document this information and try to locate the nest. For information on how to locate nests, see [Project Report; Meyer and Collopy 1995](#). While kites have not been documented

nesting on BWWMA, it is important to preserve future potential nest trees. This can be done by retaining the largest, oldest trees on the landscape during land management activities.

4.3.5: Bachman's Sparrow

Prescribed fire improves habitat quality for Bachman's sparrows, and is the primary land management tool recommended to promote habitat for this species on BWWMA. Suitable habitat can be created and maintained through frequent (≤ 3 year rotation) use of prescribed fire in sandhills and flatwoods. The occurrence of fire is critical to sustaining this species as use of an area by Bachman's sparrows declines rapidly around 18 months post-fire, and the species may abandon habitat if fire is excluded for more than 3 years. Because males use small shrubs as singing perches, apply the 'sloppy chop' technique when using mechanical treatments to reduce understory. Follow mechanical treatment with a prescribed burn.

4.3.6: Brown-Headed Nuthatch

Brown-headed nuthatches are dependent on the presence of snags for suitable nesting habitat. As such, retain snags during land management activities and ensure that new snags replace consumed snags by evaluating management practices. Old short snags with flaking bark and soft wood, and old decaying oaks with a diameter at breast height of < 10 inches are important nesting sites for this species. Take care to retain these particular types of snags.

If brown-headed nuthatches are documented in a specific area, an effort should be made to avoid prescribed fire in the area during February and March because the loss of nests early in the season frequently results in re-nesting attempts. Since most re-nesting occurs during periods of increased snake activity, this can result in greater predation on nesting females, 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.

4.3.7: Burrowing Owl

Burrowing owls are rare on BWWMA. If they are located on the area, burrows should be protected. Cattle grazing will reduce vegetation height to a level that is beneficial for burrowing owls, but cattle may also degrade or destroy burrows by trampling or wallowing in them. Area managers should consider excluding cattle from the immediate vicinity of known active burrows, when feasible. When active burrows are identified, activity within 33 feet should be avoided from February through early July. Heavy equipment should not be used around burrows to avoid collapsing them.

4.3.8: Cooper's Hawk

During the nesting season (April-July), Cooper's hawks are secretive and intolerant of human disturbance near the nest site. Males show a strong fidelity to traditional territories. For this reason, protect known nests from disturbance during land management activities by maintaining a 50-foot buffer around the nest during the nesting season. When practical, avoid heavy alteration of the habitat surrounding the nest. Whenever signs of Cooper's hawk nesting (e.g., carrying nesting material, aggressive dive bombing) are encountered, document the location and make an effort to protect the nest site.

4.3.9: Crested Caracara

Crested caracaras have high fidelity to their home ranges and nest sites. Staff will protect known nesting sites and maintain home ranges in suitable condition, if individuals are known to occupy a particular area. Management actions like cattle grazing, mowing, shredding, and prescribed burning will improve habitat conditions by creating areas with low ground and shrub cover. Guidelines in [Morrison 2001](#) suggest staff should limit management actions during the breeding season if a nest is located. If disturbance occurs too close to nests during the first 2-3 weeks of nesting, caracaras are likely to flush from the nest, which can be detrimental to eggs or young. Maintain a 1,000-foot a buffer around known nests during management activities. Morrison (2001) suggests historic management can continue during the nesting season if the birds are used to it and the first 2-3 weeks of nesting are avoided. A significant increase in human activity within the home range or territory can cause caracaras to abandon the area, even outside of the nesting season. Complete management guidelines are available in [Tech Report 18, Morrison 2001](#).

4.3.10: Florida Sandhill Crane

Prescribed fire improves the quality of upland habitat for this species, and maintains wetlands in suitable condition by reducing invasion by shrubby and woody species. Cattle grazing can also maintain open conditions preferred by this species. Increased shrub cover around wetlands impedes crane movement while increasing the potential of predation by bobcats (*Lynx rufus*). Mechanical treatments can be useful in reducing brush on wetland edges when the effect of fire is limited. In known nesting areas, management actions should occur outside of the nesting season (December - June) and after the young are able to fly. A 400-ft buffer around nest sites will minimize the likelihood of disturbance. The seasonality of wetland management activities should be considered to avoid flooding of nests or reducing foraging habitat. For management recommendations see [Tech Report 15: Stys, 1997](#).

4.3.11: Limpkin

It is possible that ongoing actions (e.g., prescribed fire, mechanical treatment, and herbicide) could have negative impacts on limpkins if the needs of the species are not considered during the planning of these activities. Staff can reduce potential negative impacts on these species by not disturbing nests. This is accomplished by identifying and protecting or avoiding these areas when conducting management activities, including hydrological restoration and prescribed burning in wetlands during nesting season.

4.3.12: Northern Bobwhite

The primary land management tool used to benefit northern bobwhite is the frequent use of prescribed fire. Ignite fires using a variety of firing techniques and environmental conditions with the goal of promoting mosaic burns. Mosaic burns result in a patchwork of burned and unburned areas that meet different life history requirements for northern bobwhite. Growing season fires are generally preferred as they trigger flowering and viable seed production in many native species. Recent evidence suggests that the frequency of fire in flatwoods communities may be just as important as the seasonality of burn. Thus, if growing season burns do not occur, it is better to burn the unit during the following dormant season rather than waiting until the following summer.

Pine stands with basal areas >70 ft²/acre should be thinned to trigger herbaceous growth and improve habitat conditions for this species. Ruderal areas can be managed for northern bobwhite through mechanical actions like mowing and or disking strips during the summer months to promote herbaceous growth. Current literature recommends maintaining serenoa cover at 25% for northern bobwhite and 30% for white-tailed deer. Although FNAI reference site DFC's list the range for serenoa cover at 10-25% in mesic flatwoods and 5-20% in dry prairie, the difference in recommended values is largely due to differences in measurement techniques. Based on area staff's review of Reference Sites, they have determined that FNAI Reference Site DFC's will meet the need of bobwhite on the area. Land management considerations for the northern bobwhite on BWWMA may be adjusted based upon the results of the high-intensity burn treatment study that is ongoing at the area.

4.3.13: Red-Cockaded Woodpecker

Current land management actions that include mowing or mechanical removal of vegetation, removal of exotic vegetation, and prescribed fire on a 2-3 year return interval in actively managed natural communities will maintain and enhance habitat conditions for this species. During land management activities, protect active and inactive cavity trees as well as large, old pines that are potential cavity trees (≥ 10 inches DBH and flat tops).

The current RCWMAG recommends thinning approximately 500 acres in areas of Webb and the Yucca Pens Unit where pine stands have a 4-8 inch basal area >20. Additional recommendations include planting 3-4 small pine plantations, and encouraging natural pine recruitment through summer burns. In addition, any land management recommendations made in the SMA to improve connectivity between red-cockaded woodpecker clusters should be included in annual work plans ([Section 4.1.1](#)). Both pine planting and timber thinning can be effective strategies to improve the condition of red-cockaded woodpecker habitat on BWWMA when applied selectively.

As BWWMA has active red-cockaded woodpecker clusters on the property and participates in federally regulated translocation, managers will follow management guidelines found at [FWC Red-Cockaded Woodpecker Management Plan](#) and [USFWS Red-Cockaded Woodpecker Recovery Plan](#).

4.3.14: Southeastern American Kestrel

Southeastern American kestrels are dependent on the occurrence of open upland habitats that contain a number of snags for nest sites and perches. While ongoing management will encourage the open foraging condition this species requires, make an effort to retain large snags during land management activities. Protecting snags when safe and practical and promoting the creation of new snags in areas currently lacking will benefit southeastern American kestrels. If southeastern American kestrels are documented in the area during the breeding season (late April through June), a nest box program may be appropriate. If nesting is documented, minimize the amount of mechanical activity within 500-feet of the nest during the nesting season and protect the snag during prescribed fires. For more information on management for kestrels, see [Technical Report 13; Stys 1993](#).

4.3.15: Southern Bald Eagle

State and federal law requires protection of bald eagles, including avoiding disturbance of nesting eagles. Managers will follow the management guidelines in the [state management plan](#) when planning activities within 660-feet of known eagle nests. Any new nests that are located will be documented. As this species is surveyed on a statewide basis, the [bald eagle nest locator](#) will be checked annually to determine if any new nests are detected. Bald eagles find unnaturally dense stands around nest trees undesirable. Continue to manage stands in which eagle nests occur, but avoid negative impacts to the eagles per the guidance of the management plan. During management activities, retain large, mature pines as potential future nesting sites.

4.3.16: 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 actions. During the nesting season, providing a 330-foot buffer around nesting colonies will ensure adequate protection. Additionally, plan any mechanical or chemical control of vegetation at a time that avoids disturbance to the colony, and use methods that do not damage the plants where nests are constructed.

4.3.17: Florida Black Bear

Bears require large areas of dense vegetation for escape and denning cover. They also require a mosaic of dense cover and edge habitat, in both uplands and wetlands, which provides seasonally abundant forage. Efforts to restore flatwoods to a more open landscape with reduced tree density, lower shrub height, and reduced shrub cover may reduce denning and escape cover for bears. However, these same efforts may increase forage availability of some berries and tubers.

Land management activities that provide a mosaic habitat structure, particularly with multi-aged palmetto patches, will provide escape cover and foraging habitat for bears. During mechanical treatment along the transitional zone between hardwood swamps and uplands, retain patches of dense vegetation to provide foraging cover. Preserve connectivity between cypress heads, depressional wetlands, and hardwood swamps to allow appropriate cover for bears to move across the area.

4.3.18: Florida Bonneted Bat

The Florida bonneted bat's reaction to land management is currently unknown. Staff working in the vicinity of known roosts and bat house boxes should avoid directly damaging the roosts during land management activities. Further land management considerations may be made based upon the results of ongoing SWG and USFWS research.

4.3.19: Florida Panther

Panthers need a diversity of cover types available for stalking prey, daytime rest sites, and den sites. The rest and den sites in particular need to contain dense understory with tall, thick vegetation. Individual patches do not need to be acres in size but should be present throughout the property. Limiting the loss of canopy coverage in forested areas is important, and area managers should apply prescribed fire using methods that will not kill overstory vegetation in forested areas. Additionally, apply fire using techniques that create a mosaic of burned and unburned areas, as this will benefit panthers. When planning land management

activities on BWWMA, staff should consider promoting and protecting travel corridors for panthers within the WMA and across boundaries to other managed areas. If denning is confirmed on the area, management activities will be planned to occur only after the panther and kittens have left the unit. Black bears will also benefit from this type of management.

Section 5: Species Management Opportunities

Land management that considers the needs of a suite of focal species provides direct benefits to many associated species. However, land management actions alone are insufficient to maintain or recover some species. These species need species-specific management ([Section 5.1](#)). Additionally, monitoring ([Section 5.2](#)) is required to verify management is having the desired influence on wildlife. [Section 5.3](#) identifies research necessary to guide future management.

5.1: Species Management

Species management as used here refers to actions other than land management, monitoring, or research, taken for a specific species. Species-specific management actions can include actions such as translocation, restocking, or installing artificial cavities. These actions may be needed for species that are currently present but occur at low densities, have low reproduction potential, or have other limitations that inhibit recovery. Additionally, species that are not present on a site, have limited dispersal capabilities, or are unlikely to occupy a site without reintroduction may require species-specific management. [Section 2](#) and [Section 4](#) provide information on land management actions, such as prescribed fire or mechanical treatments.

5.1.1: Northern Bobwhite Food Plots

Species management for northern bobwhite includes annual maintenance of approximately 425 acres of wildlife food plots on Webb. Staff maintains these food plots for the purpose of supplementing forage for northern bobwhite and other species. Food plots are seeded, disked, and treated with herbicide to remove exotics and promote the growth of herbaceous cover that benefits bobwhite forage (i.e., legumes). An additional 30 acres of food plots have been planted in the Yucca Pens Unit with appropriate management ongoing.

5.1.2: Red-Cockaded Woodpecker

Species management for red-cockaded woodpeckers on BWWMA includes providing artificial cavities and translocating first-year birds. Species management activities will follow guidelines in the [USFWS Recovery Plan](#), [FWC Red-cockaded Woodpecker](#)

[Management Plan](#) and the [BWWMA Red-cockaded Woodpecker Management Plan](#) (to be revised per [Section 3.2.14](#)).

Artificial Cavities

The purpose of the artificial cavity program on BWWMA is to ensure red-cockaded woodpeckers have access to suitable cavities in suitable locations, which increases survival and retention of individuals. Since timber management in the early 1900s removed most of the mature pines in which woodpeckers prefer to build cavities, the availability of cavity trees on BWWMA is a limiting factor for red-cockaded woodpeckers. The artificial cavity program allows managers to install cavities in locations that have suitable forage, but lack suitable trees for natural cavity creation. Additionally, artificial cavities can be strategically placed to enhance demographic connectivity, and provide managers the option of encouraging clusters in areas that may not otherwise be suitable for red-cockaded woodpeckers to create natural cavities. Staff uses artificial cavities, both inserts and drilled, to increase the number of suitable cavities within a cluster, or to create recruitment clusters in areas where managers would like to see population growth.

Translocation

The external and internal translocation of first-year red-cockaded woodpeckers has proven to be a successful tool for increasing small populations. With external translocation, managers move birds from larger populations to smaller populations. Typically, managers will move an unrelated male and female from a donor population to a suitable recruitment cluster at the recipient site. BWWMA participates in the Southern Range Translocation Cooperative and has been a recipient site for translocated birds in the past. Once an area exceeds 30 PBGs, it is no longer eligible to receive external birds from the Cooperative, as 30 PBGs should provide enough reproduction to meet internal needs. BWWMA received external translocated birds from the Cooperative in 2005 and 2008, and since the population has exceeded 30 PBG. Because the number of PBGs on BWWMA recently dropped below 30, the area could be eligible to receive birds from the Cooperative. However, staff plans to use the internal movement of birds and continued land and cavity management to grow the population. The necessity of future translocations should be assessed if PBGs on Webb continue to decline, and rejoining the Cooperative should be considered at that time.

Internal translocation remains a high priority on Webb, as pairing a single bird creates another PBG, and increases the potential for on-sight reproduction. Internal translocation is moving first-year birds (usually females) from their natal cluster to a single bird group elsewhere on the property. Internal translocations have been successful at increasing the number of PBGs in multiple populations and should be viewed as a priority on BWWMA. There were 10 solitary bird clusters on BWWMA in 2013, and internal translocation of first-years to single birds groups would help BWWMA exceed 30 PBGs without relying on external translocation. Reducing the number of single bird clusters is a

priority on BWWMA, and internal translocation is one tool managers can use to help create more potential breeding groups.

5.1.3: Bat Houses

Species management for bats on BWWMA consists of maintaining a suite of bat houses to provide roosting habitat for Florida bonneted bats and other species. The current bat houses were provided by FBC and include 2 types of bat house; triple-chambered houses commonly used by Brazilian free-tailed bats, and single-chambered houses that were designed specifically for Florida bonneted bats. On BWWMA, Florida bonneted bats have roosted in both types of bat house. While there may be more opportunities to install additional Florida bonneted bat roosts, it is not known what effect artificial roosts have on habitat use by the species. Staff will continue to maintain the current suite of bat houses on BWWMA and will communicate with species experts regarding the need for future actions regarding bat houses, based on the results of ongoing research.

5.2: Species Monitoring

Monitoring is critical to evaluating the effect of the management on wildlife. While we are unable to monitor all of the focal species on BWWMA, the recommended monitoring will assess species in all actively managed communities. Data collected will be reported to the regional conservation biologist for inclusion in the appropriate database. The FWC will make monitoring data available to cooperating agencies and organizations ([Section 6](#)).

This section lists the monitoring recommended for BWWMA as well as the purpose for each monitoring effort. The FWC is in the process of standardizing monitoring protocols for a number of these species and developing a central database for storage of monitoring data. Area staff will work with the regional Conservation Biologist to implement standardized protocols, standardize ongoing monitoring that does not have a standardized protocol, and ensure data is included in the central database.

5.2.1: Northern Bobwhite Monitoring

FWC conducts fall covey counts on Webb to estimate the population size, determine appropriate harvest rates, and evaluate the effectiveness of management strategies for northern bobwhite. Currently, surveys are part of an ongoing FWC research project with TTRS to determine the effects of burn-unit size for bobwhite populations. Monitoring is not currently conducted on the Yucca Pens Unit largely because of staff resource limitations. Staff will continue to work with the FWC researchers ([Section 6.1.2](#)) and TTRS ([Section 6.12](#)) to monitor bobwhite as part of the ongoing research. Future monitoring requirements are not known at this time.

5.2.2: Red-Cockaded Woodpecker Monitoring

Red-cockaded woodpecker monitoring on BWWMA includes cluster and cavity status checks; nest checks; chick banding; fledge checks; and monitoring of banded birds. The purpose of this monitoring is to document the number of potential breeding groups, active clusters, group size, active trees and cavities, new cavity trees and clusters, nest success, and fledgling success. Staff will continue to monitor annually in accordance with guidelines in the [USFWS Recovery Plan](#), [FWC Red-Cockaded Woodpecker Management Plan](#) and [the BWWMA Red-Cockaded Woodpecker Management Plan](#) (to be revised per [Section 3.2.14](#)).

5.2.3: Bat Monitoring

Florida Bonneted Bat Simultaneous Emergence Counts

The purpose of Florida bonneted bat simultaneous emergence counts is to determine how many bats are using occupied roosts at given points during the year. Emergence counts are conducted by observing an occupied bat house in the evening and attempting to count all bats leaving the house. Staff visits each bat house during daylight hours to look for evidence of bats (guano at the base of the box and chirping noises) and conduct nighttime counts only on boxes known to have bat activity. Simultaneous emergence counts (attempting to count at each occupied house on the same night) are done to estimate the bat house population size and are more effective than counting on separate nights. FWC plans to conduct at least 4 simultaneous counts annually, one per season.

Currently, the Regional Conservation Biologist and local staff organize and conduct simultaneous counts. A protocol should be developed to document this process. As results from SWG research become available, Florida bonneted bat monitoring processes should be updated if applicable.

Bat House Occupancy Assessment

The purpose of the FWC Bat House Occupancy Assessment is to estimate the number of bats using bat houses and evaluate the seasonality of bat house use in Florida. This protocol was developed in 2012 and is used to monitor bat houses statewide. This protocol should be implemented on BWWMA and can be done in conjunction with simultaneous emergence counts.

5.2.4: Opportunistic Monitoring Opportunities

The purpose of opportunistic monitoring is to document the presence of specific species. Opportunistic monitoring is the process of recording important information as it is

encountered. By following the Opportunistic Observations for Wildlife protocol, staff ensures their data are compatible with other opportunistic observation. Documentation of opportunistic sightings including information on species, date of the observation, observer, approximate lat/long or appropriate MU, number of individuals, behavior, and habitat type should be entered into the SaMP database. Monitoring data will be made available to cooperating agencies and organizations such as FNAI ([Section 6.6](#)). Record observations or sign of the following focal species:

- Gopher frog
- Eastern indigo snake
- Florida pine snake
- Gopher tortoise (if observed in areas not frequently seen)
- American swallow-tailed kite (aggregations of 3 or more birds on regular basis in one area during spring and any nesting activity)
- Bachman's sparrow (April-June)
- Brown-headed nuthatch (February-June)
- Cooper's hawk
- Crested caracara
- Florida grasshopper sparrow
- Florida mottled duck (nests or flightless young)
- Florida sandhill crane (nests and adults with flightless young)
- Florida scrub-jay
- Limpkin (nests or adults with young)
- Southeastern American kestrel
- Southern bald eagle (record and report new nests to baldeagle@myfwc.com)
- Florida black bear
- Florida panther
- Sherman's fox squirrel (on the Yucca Pens Unit)
- Any listed species that does not have a monitoring protocol in this section.

5.3: Species Research Needs

Species management recommendations in other sections of this document are based on the most current information available. Cases may arise where little or no information is available to guide management, and research is needed. Further, many of these focal species do not have standard monitoring protocols and research is needed to determine the most efficient means of monitoring them. For many of the focal species, research is needed to provide managers with information about aspects of natural history, such as minimum habitat patch size, preferred habitat parameters, and response to habitat management activities. This section outlines research needs identified through the WCPR process.

5.3.1: Florida Bonneted Bat Research

BWWMA provides a unique opportunity to study Florida bonneted bats as the area contains the only known roosts of the species. Research needs include filling gaps in life history information, understanding habitat requirements, and developing management recommendations.

Section 6: Intra/Inter Agency Coordination

The WCPR process identified many recommendations regarding possible management actions for focal species. WHM staff can handle most proposed management actions; however, coordination with other sections in FWC or with other agencies sometimes is necessary or more efficient. This section describes coordination that is necessary outside of the WHM section, identifies the entity to coordinate with, and provides position contacts for these entities. We attempt to provide the name, position, and contact information for the people holding the position when the Strategy was drafted. As positions experience turnover, when in doubt, contact the current Section Leader or supervisor to determine the appropriate person now holding the position.

6.1: Florida Fish and Wildlife Conservation Commission

6.1.1: Species Conservation Planning Section (SCP)

Monitoring animal populations on a WMA/WEA gives managers a way to gauge animal response to management. If this information is not shared with others, valuable data that can be used to assess statewide conservation efforts is often lost. Managers will share monitoring data with the appropriate taxa coordinator and with program coordinators for species that are part of conservation initiatives or other management programs. The regional SCP biologist is a good source of information on the regional status of non-game species. Additionally, FWC staff is authorized to handle federally listed species as long as actions are consistent with the requirements of the agency's [Endangered Species Act Section 6 Cooperative Agreement](#). To meet these requirements, staff will provide reporting as outlined in the Agreement to the agency's Endangered Species Coordinator. Please note some contacts will also be covered under [Section 6.1.4](#); FWRI, and [Section 6.1.7](#); Florida's Wildlife Legacy Initiative.

Contacts:

Brad Gruver, Species Conservation Planning Section Leader: (850) 617-9502
Vacant, Avian Taxa Coordinator: (352) 732-1225

Melissa Tucker, Mammalian Taxa Coordinator: (386) 754-1668
Vacant, Herpetofauna Taxa Coordinator: (850) 921-1143
Deborah Burr, Gopher Tortoise Management Plan Coordinator: (850) 921-1019
Michelle Vandeventer, Bald Eagle Management Plan Coordinator: (941) 894-6675
Nancy Douglass, Regional Biologist: (863) 648-3827 ext 3827
Traci Castellon, Assistant Regional Biologist: (863) 648-3817

6.1.2: Division of Hunting and Game Management (HGM)

As the FWC has a [statewide quail strategy](#), coordination with HGM's Game Species Management (GSM) on land management and populations surveys is ongoing. Northern bobwhite research is managed through this Division and staff should work with Public Hunting Area (PHA) biologists when instituting changes to management and monitoring rules.

Contacts:

Paul Schulz, GSM Section Leader: (850) 617-9539
Greg Hagan, Northern Bobwhite Coordinator: (850) 893-4153 x 340
Don Coyner, PHA Section Leader: (352) 732-1760
Jason Burton, Southwest Regional PHA Biologist: (352) 540-6096

6.1.3: Aquatic Habitat Restoration and Enhancement Subsection (AHREs)

WHIM should maintain contact with AHREs when conducting hydrologic evaluations to determine opportunities for hydrologic improvements on BWWMA.

Contacts:

Steve Rockwood, Section Leader: (321) 726-2862
VACANT, Biological Administrator: (352) 357-2398
Don Fox, Biological Administrator: (863) 462-5190
Beacham Furse, Biological Administrator: (863) 462-5192
Steven Gornak, Biological Scientist: (863) 462-5192 ext 107

6.1.4: Fish and Wildlife Research Institute (FWRI)

Area staff will cooperate with FWRI staff conducting monitoring and research for bald eagles by reporting new eagle nests through the FWC bald eagle database. Area staff will cooperate with Kevin Enge on issues regarding herpetofauna and report documentation of these species to FWRI. Report handling of migratory birds covered by the permit to Andrew Cox in January of each year. Staff band red-cockaded woodpeckers under Janell

Brush. Area staff will coordinate with Jeff Gore on issues regarding Florida bonneted bats and Dan Wolf to report dead bats via the Bat Mortality Database.

Contacts:

Robin Boughton, Section Leader: (352) 334-4218
Jeff Gore, Biological Administrator (mammals): (850) 767-3624
Andrew Cox, Research Administrator (migratory birds): (352) 334-4241
Ron Bielefeld, Wildlife Biologist (Florida mottled duck): (561) 722-1574
Janell Brush, Avian Research Biologist (bald eagle nest monitoring): (352) 334-4202
Karl Miller, Biological Administrator (avian): (352) 334-4215
Kevin Enge, Associate Research Scientist (herps): (352) 334-4209
Walter McCown, Biological Scientist (bears): (352) 334-4214
Brian Scheick, Biological Scientist (bears): (352) 334-4219
Dan Wolf, Research Assistant (bat mortality): (352) 334-4235

6.1.5: Office of Conservation Planning Services (CPS)

CPS works with private landowners and may be able to assist in making contacts or providing incentives for management activities on neighboring private lands. CPS also provides environmental commenting to ensure regional projects do not negatively influence the area. Maintaining communication regarding current and future projects will be critical.

Contacts:

Scott Sanders, CPS Office Director: (850) 617-9548 ext 9548
Luis Gonzalez, Regional Coordinator: (863) 648-3826 ext 3826
Pete Diamond, Wildlife Biologist: (239) 997-7331 ext 107

6.1.6: Imperiled Species Management Section (ISM)

The Imperiled Species Management Section is responsible for the implementation and evaluation of imperiled species management and recovery plans, and have staff dedicated to management of the Florida panther and the Florida black bear. Staff can coordinate with these individuals on issues related to these species.

Contacts:

Carol Knox, Section Leader: (850) 922-4330
Darrell Land, Panther Team Leader: (239) 417-6352
Dave Telesco, Biological Administrator (bears): (850) 922-4330
Mike Orlando, Biological Scientist (bears): (386) 965-2464

6.1.7: Florida's Wildlife Legacy Initiative (FWLI)

FWLI is an FWC led program developed to generate and coordinate cooperative conservation projects that address high priority issues identified in Florida's State Wildlife Action Plan. FWLI can assist in identifying potential partners and assisting with collaborative efforts for monitoring and management of focal species. FWLI is a potential source of project funding via [Florida's State Wildlife Grants program](#). Regular communication with this section will be valuable.

Contacts:

Kate Haley, Program Administrator: (850) 617-9503 ext 9503
Andrea Alden, Wildlife Legacy Biologist: (727) 502-4794

6.1.8: Invasive Plant Management Section (IPM)

The Invasive Plant Management Section provides technical and financial assistance to assist in the control of upland and aquatic invasive exotic plants. The Invasive Plant Management Section may serve as a resource in identifying appropriate solutions to, and funding for, exotic plant issues.

Contacts:

Bill Caton, Section Leader: (850) 617-9428
Linda King, Subsection Leader: (850) 617-9428
Donald Eggeman, Biological Administrator: (850) 617-9500
Danielle Kirkland, Biological Administrator: (863) 534-7074
Michael Sowinski, Biological Scientist: (863) 534-7074

6.2: South Florida Water Management District (SFWMD)

The SFWMD is responsible for permitting for hydrologic activities as needed. The SFWMD should be contacted in regards to ditch-block construction and other activities intended to improve hydrologic conditions on BWWMA.

Contacts:

Steve Sentes, (239)-338-2828 ext 7754
Phil Flood, Jr., Intergovernmental and Outreach Representative:
(239) 338-2929 ext 7768

6.3: Southwest Florida Water Management District (SWFWMD)

The SWFWMD is responsible for permitting for hydrologic activities as needed.

Contacts:

Nicole Mytyk: (813) 985-7481 x 6591

6.4: Florida Bat Conservancy (FBC)

The FBC conducted surveys and assisted in identifying best locations for bat houses on BWWMA. Continued coordination with FBC for activities relating to Florida bonneted bats is recommended.

Contact:

George Marks, President FloridaBatConservancy@gmail.com

Cyndi Marks, Executive Director, FloridaBatConservancy@gmail.com

Amy Clifton: FBC agency contact, (727) 710-2287

6.5: Florida Forest Service (FFS)

The FFS provides authorizations for prescribed burning and assists in controlling escaped fires. FFS can provide assistance with timber management including administration of contracts for thinning operations. BWWMA staff should continue to coordinate prescribed fire and timber management activities with FFS.

Contacts:

Ed Flowers, Forestry Resource Administrator, Myakka District: 941-727-6475

Butch Mallett, Senior Forester: (850) 228-7809

6.6: Avian Research and Conservation Institute (ARCI)

ARCI surveys and keeps information on American swallow-tailed kite and short-tailed hawk populations. Location information on the swallow-tailed kite and short-tailed hawk, particularly nests or nesting behavior, should be shared with ARCI.

Contacts:

Dr. Ken Meyer, Avian Researcher: (352) 335-4151; meyer@arciinst.org

Gina Kent, Research Ecologist and Coordinator: (352) 514-5607;

ginakent@arciinst.org

6.7: Florida Natural Areas Inventory (FNAI)

FNAI collects, interprets, and disseminates ecological information critical to the conservation of Florida's biological diversity. The FNAI's database and expertise facilitate environmentally sound planning and natural resource management to protect the plants, animals, and communities that represent Florida's natural heritage. The FNAI maintains a database of rare and listed species that is often used for planning purposes. As such, staff should share information about tracked species occurrences on BWWMA with FNAI to ensure this information is included in their database. FWC also has a contract with FNAI for plant and animal surveys if the need exists and resources are available.

Contacts:

Dan Hipes, Chief Scientist: (850) 224-8207

Kim Gullede, Senior Ecologist: (850) 224-8207

6.8: United States Fish and Wildlife Service (USFWS)

The USFWS has listed the Florida bonneted bat as an Endangered species and works with FWC to collect information on the species on BWWMA. Other federally listed species modeled to have potential habitat on BWWMA include the Florida panther and wood storks. FWC should continue to partner with the USFWS on projects relating to any federally-listed species, including red-cockaded woodpecker monitoring and management.

Contacts:

Paula Halupa, Listing, Candidate Conservation, and Recovery: (772) 562-3909 x 257

Marilyn Knight, Endangered Species Recovery: (772) 562-3909 x 287

Will McDearman, RCW Recovery Coordinator: will_mcdearman@fws.gov

6.9: Florida Bonneted Bat Working Group

The Florida Bonneted Bat Working Group was formed to address the conservation needs of this species across its range. Members include the FWC, USFWS, NPS, ZooMiami, FBC, and several other private and public entities. BWWMA staff participates in this group, as well as the Regional Conservation Biologist, Mammal Taxa Coordinator and FWRI Staff.

Contacts:

Mike Kemmerer, BWWMA Area Manager, FWC: (941) 833-2555

Jennifer Myers, FWC Regional Conservation Biologist: (863) 581-6949

Melissa Tucker, FWC Mammalian Taxa Coordinator: (386) 758-0525 ext 114

Jeff Gore, FWRI Biological Administrator (mammals): (850) 265-3677

6.10: Red-Cockaded Woodpecker Management Advisory Group (RCWMAG)

In 2012, a Red-cockaded Woodpecker Management Advisory Group (RCWMAG) was created. The objective of this group is to identify problems, actions, and deliverables as related to the successful management of Webb's red-cockaded woodpecker population and associated timber resources and build consensus among all staff involved in the sustainable management of area resources. The RCWMAG will take the lead on updating the Red-cockaded Woodpecker Management Plan for BWWMA ([Section 3.2.14](#)).

Contacts:

Steve Shattler, FWC, MAG Leader: (863) 441-5077
Chad Allison, FWC District Biologist: (863) 648-3200

6.11: United States Geological Survey (USGS)

The USGS is working on an adaptive management study to provide information to FWC on factors that may affect northern bobwhite harvest on BWWMA. This study was completed in 2013 and is currently under review with FWC. Staff will continue to work with the USGS to collect data, evaluate research results and modify management practices as needed.

Contact:

Fred Johnson, Wildlife Biologist: (352) 264-3488

6.12: Tall Timbers Research Station (TTRS)

TTRS conducts statewide research and monitoring on northern bobwhite quail populations. BWWMA staff should continue to coordinate with TTRS as needed on issues affecting quail research, monitoring and harvest on BWWMA. Staff from TTRS also collected genetic data on brown-headed nuthatches on BWWMA.

Contact:

Bill Palmer, Executive Director (northern bobwhite): (850) 668-7781
Jim Cox, Research Biologist (brown-headed nuthatch): (850) 893-6470

6.13: Mississippi State University

Mississippi State University is involved with the Quail Research Project on BWWMA. Staff should interact with representatives of the Quail Research Project when discussing rule changes and future research for northern bobwhite on BWWMA.

Contact:

James Martin, Assistant Professor: (662) 325-7607

6.14: Charlotte Harbor Flatwoods Initiative (CHFI)

The Charlotte Harbor Flatwoods Initiative includes several representatives of state agencies, county governments, federal agencies and private interests with the purpose of addressing watershed problems on BWWMA and in the surrounding landscape. FWC will continue to participate in this group to facilitate local and regional hydrologic restoration.

Contacts:

Phil Flood, Jr., South Florida Water Management District: (239) 338-2929 ext 7768

6.15: Babcock Ranch Preserve (BRP)

Babcock Ranch Preserve is immediately adjacent to the east of BWWMA and is cooperatively managed by Babcock Ranch, Inc., Babcock Ranch Management, LLC, the FWC, the Florida Forest Service (FFS) and Lee County (on the Lee County portion). BRP protects regionally important water resources, diverse natural habitats, and historic and cultural resources. Many species occur on BRP that also occur on BWWMA, including red-cockaded woodpeckers, Sherman's fox squirrels, Florida bonneted bats and Bachman's sparrows. After 2016, ownership of BRP will fall to FFS, which will cooperate with FWC in management of the area. Please contact [FFS](#) at that point for management concerns.

Contacts:

Steve Smith, Vice President and General Manager: (941) 639-3958

6.16: Lee County

Lee County staff participates in the [Charlotte Harbor Flatwoods Initiative](#), and Cathy Olson conducts an annual Breeding Bird Survey and National Migratory Bird Survey on Webb. Staff should interact with Lee County yearly to obtain results from avian surveys.

Contact:

Cathy Olson: (239) 533-7455

6.17: Peace River Audubon Society

The Peace River Audubon Society conducts an annual Christmas Bird Count on Webb. Staff should contact the Audubon Society yearly to obtain results of bird counts.

Contact:

Tony Licata, Christmas Bird Count Coordinator: (941) 505-9735, alicata@dewis.com

Section 7: Beyond the Boundaries Considerations

BWWMA encompasses a large area and has enough potential habitat to support independent, viable populations of many focal species. With appropriate management, BWWMA will continue to fulfill its conservation role. Through proper management of flatwoods, BWWMA can help support a number of fire-dependent species, such as the red-cockaded woodpecker, Bachman's sparrow, brown-headed nuthatch, northern bobwhite, and Sherman's fox squirrel. Many of BWWMA's wide-ranging focal species (e.g. Florida black bear, Florida panther, Cooper's hawk, southern bald eagle, and American swallow-tailed kite) are not common on the area, but will continue to occasionally use BWWMA because of the large amount of potential habitat in the region, including BRP. Furthermore, the surrounding network of conservation lands will help ensure the persistence of many of the wide-ranging focal species.

The current management boundaries do not include all important habitat for focal species, such as the lands identified as Strategic Habitat Conservation Areas (SHCAs) for American swallow-tailed kite and Cooper's hawk. The FWC originally identified SHCAs in the [Closing the Gaps in Florida's Wildlife Habitat Conservation System](#) report. The goal of SHCAs is to identify the minimum amount of land needed in Florida to ensure long-term survival of key components to Florida's biological diversity. The SHCAs identify important habitat conservation needs remaining on private lands. New SHCAs have been identified in a recent FWC update to the Closing the Gaps entitled [Wildlife Habitat Conservation Needs in Florida](#). This report identified SHCAs within 3 miles of BWWMA for the American swallow-tailed kite, Cooper's hawk, Florida panther, burrowing owl, Florida scrub-jay, and Florida grasshopper sparrow. Although it is unlikely Florida will acquire all property identified in SHCAs, encouraging land use and management that is compatible with the needs of BWWMA focal species should be a priority in this area.

Significant human population growth is projected to occur by the year 2060 in the area surrounding BWWMA and BRP. While the current conditions on BWWMA and

neighboring conservation areas provide an opportunity to further the conservation of many focal and imperiled species, changes in management or land use beyond the boundaries could have a significant effect. Any changes that impede the ability to use prescribed fire would be detrimental to fire-dependent species such as the red-cockaded woodpecker, northern bobwhite, brown-headed nuthatch, Bachman's sparrow, and many of the listed plants. Further degradation of hydrologic resources would be detrimental to wading birds and limpkins, as well as some of the listed plants.

Staff should coordinate with CPS to ensure private landowners around BWWMA are informed about incentive programs that encourage conservation-based management, and that they receive the proper technical assistance to affect this management. CPS should also ensure environmental commenting includes recommendations for compatible uses of lands adjacent to BWWMA.

Document Map

Species	Species Assessment	Land Management Actions	Species Management Actions	Species Monitoring	Research	Coordination
Gopher Frog	Section 3.2.1	Section 4.3.1		Section 5.2.4		Section 6.1.4
Florida Pine Snake	Section 3.2.2	Section 4.3.2		Section 5.2.4		Section 6.1.4
Gopher Tortoise	Section 3.2.3	Section 4.3.3		Section 5.2.4		
American Swallow-Tailed Kite	Section 3.2.4	Section 4.3.4		Section 5.2.4		Section 6.6
Bachman's Sparrow	Section 3.2.5	Section 4.3.5		Section 5.2.4		Section 6.1.4, 6.16, 6.17
Brown-Headed Nuthatch	Section 3.2.6	Section 4.3.6		Section 5.2.4		Section 6.1.2, 6.16, 6.17
Burrowing Owl	Section 3.2.7	Section 4.3.7		Section 5.2.4		
Cooper's Hawk	Section 3.2.8	Section 4.3.8		Section 5.2.4		
Crested Caracara	Section 3.2.9	Section 4.3.9		Section 5.2.4		
Florida Mottled Duck	Section 3.2.10			Section 5.2.4		
Florida Sandhill Crane	Section 3.2.11	Section 4.3.10		Section 5.2.4		
Limpkin	Section 3.2.12	Section 4.3.11		Section 5.2.4		
Northern Bobwhite	Section 3.2.13	Section 4.3.12	Section 5.1.1	Section 5.2.1		Section 6.1.2, 6.11, 6.12, 6.13
Red-Cockaded Woodpecker	Section 3.2.14	Section 4.3.13	Section 5.1.2	Section 5.2.2		Section 6.1.1, 6.8, 6.10
Southeastern American Kestrel	Section 3.2.15	Section 4.3.14		Section 5.2.4		Section 6.1.4
Southern Bald Eagle	Section 3.2.16	Section 4.3.15		Section 5.2.4		Section 6.1.1
Wading Birds	Section 3.2.17	Section 4.3.16		Section 5.2.4		Section 6.1.3
Florida Black Bear	Section 3.2.18	Section 4.3.17		Section 5.2.4		Section 6.1.4, 6.1.6
Florida Bonneted Bat	Section 3.2.19	Section 4.3.18	Section 5.1.3	Section 5.2.3	Section 3.3.1	Section 6.1.1, 6.1.4, 6.4, 6.8, 6.9
Florida Panther	Section 3.2.20	Section 4.3.19		Section 5.2.4		Section 6.1.4, 6.1.6
Sherman's Fox Squirrel	Section 3.2.21			Section 5.2.4		
Limited Opportunity Spp.	Section 3.2.22			Section 5.2.4		Section 6.1.1, 6.1.4

8 BWWMA Timber Assessment

TIMBER ASSESSMENT
FRED C. BABCOCK/CECIL M. WEBB
WILDLIFE MANAGEMENT AREA
PREPARED BY
BUTCH MALLET
SENIOR FORESTER, OTHER PUBLIC LANDS REGION 4
FLORIDA FOREST SERVICE
FEBRUARY 2014

INTRODUCTION

PURPOSE

This document is intended to fulfill the timber assessment requirement for Fred C. Babcock/Cecil M. Webb Wildlife Management Area (BWWMA) as required by Section 1. Section 253.036, Florida Statutes. The goal of this *Timber Assessment* is to evaluate the potential and feasibility of managing timber resources for conservation and revenue generation purposes.

BACKGROUND

The original 19 sections of BWWMA were purchased by the state in 1941. Additional land was bought through the years until the current 65,758 acres were reached. These later purchases include the 14,577-acre Yucca Pens Unit that lies west of U. S. Highway 41 and east of Burnt Store Road. Quail and deer hunting, along with some fishing in man-made borrow pits, have been the primary uses of BWWMA since the state acquired the property.

GOALS AND OBJECTIVES

The primary timber management objective for BWWMA is to restore where necessary and maintain a healthy South Florida flatwoods ecosystem.

WILDLIFE MANAGEMENT

Game Species

BWWMA is a quail management area where FWC used annual winter prescribed burning extensively for many years. In recent years, land managers have shifted to year-round burns. These prescribed fires favor the production of northern bobwhite (*Colinus virginianus*) and white-tailed deer (*Odocoileus virginianus*) by producing nutritious forage and encouraging seed, bud, and insect production. However, there is believed to be a lack of mature hardwood communities that limits turkeys (*Meleagris gallopavo*). To address this deficiency, extensive planting of hardwood tree species and protection from prescribed burns would be needed.

Nongame Species

Healthy flatwoods communities are characterized by open, uneven-aged pine stands that allow a considerable amount of sunlight to reach the forest floor. Ground cover is a diverse mixture of grasses, herbaceous plants, and dried pine needles that foster frequent lightning season fires. Saw palmettos are scattered and low growing.

A premier “indicator species” with regards to the health of mesic pine flatwoods is the red-cockaded woodpecker (*Picoides borealis*) (RCW). Management activities that maintain viable populations of RCWs may also benefit other native flora and fauna. At present, BWWMA has approximately 38 active RCW clusters and 28 potential breeding pairs. Of these, around 20 produce fledglings each year.

TIMBER MANAGEMENT

Timber management is an effective tool used to restore and maintain healthy ecosystems. Pine trees are removed to allow more sunlight to reach the forest floor or provide access for machinery to control unwanted vegetation. Seedlings are planted or natural regeneration is encouraged where stands are too thin or young trees are lacking. A side benefit to these management practices is quite often marketable, revenue-producing tree products.

The only commercially valuable tree species on BWWMA is South Florida slash pine (*Pinus elliotti var. densa*) (SFSP). However, longleaf pine (*Pinus palustris*) (LLP) has been observed growing on slightly drier sites on the area. LLP was likely a component of these flatwoods ecosystems at some time in the past.

Large expanses of nothing but old or young trees do not function like healthy flatwoods ecosystems. Old growth trees are necessary to provide cavity sites for RCWs. But, having nothing but old trees in a stand is dangerous. As pine trees grow older, they become less vigorous and are more likely to succumb to insects, disease, or other stresses. Waiting until a stand of old trees starts to die before being concerned about regeneration is asking for major ecosystem disruption. Slash pine has a life expectancy of about 100 years. To insure a steady supply of pine trees old enough to function as RCW cavity trees, some long-term planning and management is required. Stands should contain a mixture of all age classes.

GENERAL GUIDELINES

A useful measurement of tree stocking and density is its basal area per acre (BA). BA is the cross sectional area (in square feet) of a tree measured four and one-half feet above the ground. (The diameter of individual trees measured at this height is referred to as its diameter breast height or DBH.) Fully stocked pine stands have enough trees per acre of a size large enough to utilize the growing space without causing over-crowding. SFSP stands with 70 to 100 square feet of BA are considered fully stocked. It requires more, smaller diameter trees than it does larger diameter trees to equal one square foot of BA. (For example: It takes 357 evenly spaced, six-inch diameter breast height trees to equal 70 sq. ft. BA. Whereas, only 89 twelve-inch DBH trees per acre equal the same 70 sq. ft. BA.)

BA can be roughly correlated to crown coverage and therefore needle-cast. About 40 to 60 sq. ft. BA should provide sufficient needle-cast to carry prescribed fire and adequate sunlight for native grasses to be maintained.

To create uneven aged pine stands, group selection openings are sometimes cut during thinning activities. These openings allow young trees to become established by seed fall from nearby trees or by planting seedlings. Since SFSP or LLP seedlings require direct sunlight to grow, all trees within the opening must be removed. However, openings can be as small as one-half acre. For natural regeneration, the ideal width of the openings is about two to three chains. To prevent saplings growing in these openings from becoming barriers to RCW flight patterns, group selections should not exceed five acres in size.

Combined acreage of all openings cut within a stand during each thinning is kept to no more than five to ten percent of the total stand acreage. Since each stand only gets thinned every ten-plus years, over-harvesting of old-growth trees is avoided and a steady supply of young trees is ensured. In other words, after six ten-year cutting cycles at least 40 % of a stand would have 60+ year-old trees and 60% would range from seedlings to 50 year-old trees. Group selection openings in pure stands of South Florida slash are an excellent place to induce species diversity by planting LLP seedlings.

Planting activities, group selection openings, palmetto control measures, and natural regeneration in thin stands will produce young tree stands of various sizes. A well- stocked stand of young pine trees will usually require the removal of weak, diseased, and some over-crowded trees beginning by the age of 15 to 20 years. By this time, the crowns have grown together and ground cover begins to get shaded out. Harvesting a portion of the timber maintains healthy pine growth and provides sunlight to the forest floor. Trees removed in the thinning process can be sold to generate revenue to be used in other land management projects. Likely markets for early thinnings from pine stands currently include pulpwood, fence posts and landscape mulch.

Due to shading effects, trees grown in tight spacing produce fewer and smaller lower limbs. The shedding of the lower limbs makes them more desirable for fence posts and later, more valuable products. Planting at least 400 seedlings per acre also helps insure the marketability of the pine trees and increases future management options.

The need for second and later thinnings will depend on how low the BA was taken in the first thin and successive growth rate. If the BA is reduced to 40 to 60 sq. ft. in the first cut, another harvest will probably be needed in fifteen to twenty years. Using this method of successive thinning can generate significant revenues and still maintain a stand of pine trees and a healthy ecosystem.

In current or potential RCW clusters a BA of at least 40 square feet of 60+ year old pine trees should be maintained. These stands should also include a mixture of younger age classes up to about 60 sq. ft. BA. Nearby stands should be managed with an eye toward becoming RCW foraging zones and future cluster sites. Raising stocking levels of pine trees in the thousands of acres of severely under-stocked stands will increase future options for land managers as well as RCWs.

EXISTING RESOURCES

BWWMA is a large tract of land. Identifying individual stands and defining exact acres requiring a specific management practice is beyond the scope of this assessment. A more detailed Timber Stand Description is needed to properly plan long-term timber management activities. In 2004 an RCW habitat assessment was conducted by Landmark Consultants. They identified stands where management was needed, aligned RCW habitat with the structure of existing tree stands, and provided recommendations for more effective management.

The following are general descriptions and management recommendations. A prime objective on this tract is to maintain a healthy ground cover of grasses and forbs. Adequate sunlight must reach the ground to achieve this goal. From a timber management standpoint, this means that in general pine-stocking levels need to be maintained in the 40 to 60 sq. ft. BA range.

Plantations

There are several existing pine plantations on the north end of the property. Those near the Boy Scout camp have not been thinned and have a BA of over 100 sq. ft.

Recommendations

Stands not previously thinned should be cut back to 40 to 60 sq. ft. BA during the first thinning. Do this by first removing the diseased, deformed, suppressed, and over crowded trees. Retained trees should be healthy, vigorous, and well spaced.

Natural

BAs of natural SFSP stands throughout BWWMA vary from 0 to over 120 sq. ft. per acre. Stand ages are mostly mixed with a limited number of trees over 60 years. Regeneration under 10 to 15 years of age is even rarer, especially in areas of annual prescribed burns.

Recommendations

<10 BA - These areas have insufficient pine trees to regenerate themselves. Control the saw palmetto through the use of roller drum choppers and fire. Plant SFSP as described under Artificial Regeneration section below. To increase species diversity, some drier sites might be considered suitable for planting of LLP seedlings.

Many factors affect the need for and timing of future thinnings. These include initial planting density, number of trees surviving to merchantable size, crown closure (ground cover shading), and loss of crown. As soon as the trees achieve crown closure, thin the stand to 40 to 60 sq. ft. BA by first removing the weak, diseased, and suppressed trees. At the same time, enough of the co-dominant trees should be removed to reach the proper spacing.

The thinning process is repeated every time the stand approaches 100 sq. ft. BA or ground cover begins to be shaded out. Thinning to as low as 40 sq. ft. BA with re-treatment at 80 to 100 sq. ft. to insure open, grassy stands is reasonable in second or subsequent harvests.

10 to 30 BA - These stands may or may not have enough seed trees to regenerate themselves. Though for certain, any further loss of mature trees could preclude a healthy future. Stands with these marginally low BAs should be included in the regeneration plan. See natural and artificial sections regeneration below.

40 to 60 BA - These stands have an adequate number of pine trees to utilize the growing space without over crowding. No harvests are necessary in these stands unless thinning is required to allow access for roller drum chopping of palmettos. If chopping is needed, follow spacing recommendations as described in the Natural Regeneration section. In large stands with little regeneration, some group selection openings may be cut to promote seedling establishment.

>70 BA - Pine stands with this level of stocking are probably beginning to shade out the ground cover. These stands should be thinned to 40 to 60 sq. ft. BA. If chopping for palmetto control is needed, follow spacing recommendations as described in the Natural Regeneration section. Group selection openings should be scattered throughout these stands to promote seedling establishment.

Implementation of recommended timber management practices should begin within the next fiscal year. Pine stands with BA of over 100 sq. ft. and a heavy saw palmetto understory should be the first to be treated. As much as 500 acres per year of such stands could be thinned for the next few years without getting too far ahead of a stand description generated management plan. Revenues generated from sale of these thinnings can be used to pay for habitat restoration, pine reestablishment, and the comprehensive timber stand description/management plan.

SALVAGE SALES

On occasion, small volumes of wood may need to be removed due to fire, windstorm, insect or other damage. The decision whether or not to harvest the affected timber will depend on the threat to the surrounding stands, risk of collateral ecological damage, and the volume/value of the trees involved. For example, small, isolated lightning-strike beetle kills are a natural part of a healthy ecosystem and normally would not be cut. However, if a drought caused the insect infestation to spread, the infected trees and a buffer zone might have to be removed.

NATURAL REGENERATION

Recommendations

10 to 30 BA – As trees mature and begin to bear cones, control saw palmetto height and density. This can be accomplished by burning the stand in late winter or early spring to remove most of the fronds. Then roller drum chop the palmettos prior to the summer rainy season with a chopper heavy enough to sever their stems (probably a medium or heavy, single or tandem). A second burn in the summer after the chopping is complete would be beneficial if a fire will carry.

If for any reason an adequate number of young seedlings are not established by the second summer following the initial chopping, burn the stand again prior to end of the rainy season. This will allow some grasses to re-grow enough to protect the seeds and fragile seedlings.

Once 400 to 600 seedlings per acre are established and growing, withhold fire from the stand for at least two to three years. Timing of reintroduction of prescribed fire into regenerated stands will depend on seedling height growth and fuel loads. Generally, 400 or more trees per acre should be at least four feet in light fuels or ten feet in heavier fuels before the stand is burned.

With short trees and heavier fuels, the first burn might have to be accomplished at night to prevent excessive scorch and mortality. These stands can probably be returned to the normal rotation following the first post-establishment burn, if fuels are light and fire frequent enough.

30 to 50 BA - Again control saw palmetto as above. These stands may require thinning alone or in combination with group selection cuts to allow the roller choppers to treat the palmettos without killing remnant pine trees. Spacing between leave trees or clusters of leave trees should be at least 20 to 30 feet to give room for the tractor and chopper to operate. Group selection openings should be at least two chains wide to allow adequate sunlight for sapling growth. Follow the fire regime as described above.

> 50 BA - These stands need reforestation treatment only where saw palmetto must be controlled or additional age classes are desired (i.e. insufficient number of trees younger than ten years old). Where palmetto control is a priority, thin pines to 40 sq. ft. per acre (at least 20 to 30 feet between leave trees or clusters if chopping is required). Scatter group selection openings throughout the stand. These openings are not necessary in stands that occur as strands with under-stocked areas close enough to utilize the natural seedfall. Roller-chop the stand, evaluate success and implement fire regime as above. If palmetto is not a problem, skip the chopping. Then, evaluate success and burn as above.

ARTIFICIAL REGENAERATION

Hand Planting

Hand planting of either bare-root or containerized SFSP seedlings is one option for reestablishment in areas where an inadequate number of seed trees exists. Bare-root trees are planted in the winter. Tubelings can be planted in winter or summer, thereby extending the planting season. Recommendations for planting of LLP seedlings are basically the same as for SFSP.

Plant approximately 400 seedlings (depending on soil carrying capacity and historical data) per acre at varying spacing. On poorer sites as few as 200 seedlings per acre can be planted.

A word of caution about hand-planted tubelings. To ensure survival of relatively high-priced containerized stock, some form of herbicidal control may be necessary. Competition from grasses for soil moisture during hot, dry weather can cause severe losses of young seedlings. Applying a contact herbicide such as Roundup in either 2' wide strips or in spots can control these grasses. The herbicide should be applied far enough in advance of planting time so the grasses have time to "brown up" and indicate where to plant the seedlings.

Machine Planting

Meander the planting of bare-root or containerized SFSP seedlings at an average of about 400 trees per acre. It is more difficult to vary the spacing and make the planting look random with machine planting. This is due primarily to the inability of tree planters to make sharp turns and still pack the soil around the seedlings roots. Tight turns are also hard on the planter's bearings. The desired effect can be obtained by gradually curving the planting rows and varying the distance between and within the rows.

Again competition for soil moisture during dry weather can cause heavy losses of seedlings and waste of planting costs. Where grass is thick, it is best to either herbicide strips as described above or use a combination planter/scalper to plant the seedlings. The scalper should be set to no more than 2 to 3 inches deep and 18 to 24 inches wide. These settings will minimize soil disturbance and maintain continuity of fuels for future prescribed burns, but the seedlings will have a decent chance of survival.

Direct Seeding

Direct seeding of SFSP can be used to simulate more natural densities and distribution. However, an adequate seedbed must still be prepared by roller-drum chopping of heavy saw palmettos and burning of leaf litter to expose bare mineral soil. Even with these measures in place, managers can not be assured of an adequate crop of seedlings. It is recommended that direct seeding only be used when excess, low cost seed is used.

Seed should be treated with repellent prior to being broadcast for prevention of animal predation. Then, they should be spread at the rate of ¼ to 1/2 lbs. per acre using a tractor-mounted spreader or aerially. Seed should be spread in the late fall or early winter. Assess survival after the first summer to determine the need for supplemental planting. Protect seedlings from fire until they reach a height of four feet in light fuels or ten feet in heavier fuels. The first prescribed burn after establishment should be conducted at night.

MISCELLANEOUS FOREST PRODUCTS

Pine Cones

Seed from native SFSP is needed to help restore flatwoods ecosystems throughout the lower half of the state. BWWMA's open pine stands with low ground cover are ideal for collecting pine cones. The seed obtained by collection activities may not generate any revenue, but they can be invaluable in restoration of cutover portions of BWWMA and other state lands in the region.

PRESCRIBED FIRE

Lightning-induced fires are natural to Florida mesic flatwoods communities. Prior to European settlement, they occurred at regular intervals of one to five years. Without fire, native habitats would probably have turned into densely shaded hardwood hammocks. Introduction of effective fire suppression in the mid-1900s resulted in thick stands of saw-palmetto and subsequent loss of other grassy and herbaceous ground covers. Use of prescribed fire is essential to the maintenance of open healthy, pine-dominated ecosystems.

Saw palmetto heights have been kept to a minimum due to the frequent winter burns. However, their density does not appear to have been reduced.

Burning is essential to maintaining a healthy flatwoods ecosystem. However, caution must be exercised when reintroducing fire into these systems. Survival of expensive, newly established

seedlings depends on timing and careful execution of burns. To prevent damage to delicate root systems and avoid smoky duff fires, be sure that there is adequate moisture in any organic matter thicker than approximately one inch. In stands with heavy duff layers, try to burn no more than one inch of duff at a time on approximately two to three-year intervals. At least the first burn should be at nighttime, during the dormant season after the seedlings have reached four feet or more in height and there is enough needle litter to carry the fire. If ground fuels are not too heavy, succeeding burns can be switched to the growing season.

ACCESS

BWWMA has an extensive network of roads that can be used for forest management purposes. However, many of them would benefit from reinforcement with rock or shell to support the heavy trucks used in timber operations. It is beneficial to establish a few primary roads for access to quadrants of the tract. These road improvements benefit other activities including hunting access and prescribed burning. It also reduces wear and tear on FWC trucks and travel time across the area.

SUMMARY

In rapidly urbanizing areas of the state, public lands are often the only refuges for native plant and animal communities. Restoring and maintaining these ecosystems is an important function of land managers. Merchantable timber is a byproduct of good ecosystem management. Timber harvests can be carefully designed to protect water quality and create openings in the tree canopy allowing sunlight to reach the forest floor. These clearings and their ecotones are favorite spots used by wildlife for feeding, resting, mating, nesting, and rearing of offspring. The added sunlight allows new pine seedlings to become established in their native ecosystems and grow to replace trees killed by lightning, insects or disease. In all restoration scenarios, the exact methods and final results will be guided by the best available ecological information to conserve biodiversity of the affected habitats.

Mechanical equipment, used in timber harvests, helps reduce dense understory vegetation such as saw palmetto, gallberry and invasive plants. Thinning of dense timber stands also allows a tractor pulled roller-drum chopper to reduce the understory vegetation. This fuel reduction makes the introduction of prescribed fire easier, safer and more effective. The ability to maintain a frequent burning schedule is essential to keeping healthy ground cover.

Markets for pine timber thinning have been strong and relatively stable for several years. Likely purchasers of forest products from BWWMA include a fence post company, a small piling/pole/post mill, a few small sawmills, and several landscape mulch plants. Keep in mind that successful timber sales may require timing to match market conditions. The secret to timing the markets is to be flexible about when stands need to be cut and keeping up with market factors throughout the state.

Money generated through sales of timber products can relieve the burden on taxpayers for much needed management activities.

9 BWWMA Prescribed Fire Plan

FIRE MANAGEMENT PLAN
FRED C. BABCOCK/CECIL M. WEBB
WILDLIFE MANAGEMENT AREA
FEBRUARY 2014

INTRODUCTION

PURPOSE

This document is intended to fulfill the fire management planning requirements for Fred C. Babcock/Cecil M. Webb Wildlife Management Area (BWWMA) as required by the Management Plan development process. The goal of this *Fire Management Plan* is to describe the history, goals, processes, and implementation of prescribed fire on the area. This plan outlines objectives, preparations, and resources that will be used to safely and effectively achieve land management objectives via prescribed fire.

BACKGROUND

The BWWMA is located in the center of Charlotte County (Figure 1). The 65,758 acre area is approximately 13 miles wide and 9 miles deep with an elevation ranging from 22 – 41 feet above sea level. Four highways surround the area: I-75, US 41, SR 74 and SR 31. The area is located 5 miles southwest of Punta Gorda and 15 miles north of Ft. Myers.

The BWWMA's Yucca Pens Unit (YPU) is located in Charlotte and Lee County (Figure 1). The 15,014 acre YPU has an irregular boundary and is situated west of US 41 and east of Burnt Store Road with an elevation ranging from 9 – 24 feet above sea level. Zemel Road traverses the northern part of the area, two miles south of the northern boundary. The sizable Burnt Store Marina is located just west of the area. The city of Cape Coral forms the southern boundary with Ft. Myers located 6 miles southwest. Punta Gorda is located 8 miles to the north.

The area is made up of South Florida pine flatwoods interspersed with primarily seasonal ponds and occasional cypress strands. The historic uses of the area have included settlement, timber harvesting, turpentine operations, lighter stump harvest, WWII bombing range and machine gun practice area, hunting, and cattle grazing.

GOALS AND OBJECTIVES

The BWWMA was purchased utilizing federal Pittman-Robertson dollars for the creation of a hunting area in southwest Florida. Management of the BWWMA has focused on northern bobwhite through maintaining early successional habitat, primarily through the use of prescribed fire.

The YPU was purchased with funding from the state of Florida's various acquisition programs (CARL, P-2000, and Florida Forever) to preserve the largest remaining tract of South Florida pine flatwoods in southwest Florida. Prescribed fire is used extensively to create conditions necessary for survival and perpetuation of all common and rare species and to reduce fuel loads minimizing the risk of wildfire to adjacent properties.

The BWWMA has been maintained on several fire regimes over the years, but is currently under a 1-3 year burn rotation. Due to staffing commitments for the burn program at BWWMA, the YPU has not been burned under a regular schedule.

Habitat Management

The BWWMA and the YPU (80,772 acres combined) both have similar habitat, comprised primarily of pine-palmetto flatwoods with interspersed ponds. The ponds vary from seasonal to permanent with the majority being seasonal.

The largest community types are mesic flatwoods (~30,500 ac.), depression marsh (~16,000 ac.), wet flatwoods (~15,000 ac.), dry prairie (~10,000 ac.), and wet prairie (~5,000 ac.). The YPU has cypress strands that are not present on the BWWMA. More detailed descriptions of vegetation types are located in the BWWMA Management Plan.

Imperiled Species Management

Two listed plant and animal species on the BWWMA and YPU which require frequent fire include beautiful pawpaw (*Deeringothamnus pulchellus*) and the red-cockaded woodpecker (*Picoides borealis*). A suite of focal species identified for the area, most of which are imperiled and rely on some level of burning, can be found in the area's Wildlife Conservation, Prioritization, and Recovery Strategy.

PRECRIBED FIRE

The South Florida pine flatwoods ecosystem is a frequent fire maintained ecosystem. The natural fire regime has been estimated at 2-5 years, with most fires occurring in the 1-3 year range. The frequent fire regime is required for many of the species to thrive and has always been an integral part of this area initiated by lightning strikes and utilized by Native Americans, ranchers, and hunters.

Both areas are divided into burn blocks by firelines. These lines are disked annually to reduce the chance of fire escape and prevent vegetation build-up. Blocks on the BWWMA are approximately 160 acres, while the YPU blocks vary from 50 – 150 acres.

After an initial application of prescribed fire, all areas are burned again within 2-7 years to maintain early successional habitat and reduce wildfire occurrence. Problem areas with large palmettos are candidates for treatment with roller chopping to reduce fuel height, fire intensity and fuel loads.

IDENTIFYING UNITS

The most important goal of the prescribed burning program on BWWMA is to increase or maintain wildlife populations of both game and listed species. Indicators of appropriate habitat conditions for these species (vegetation height, percent open space, etc.) are used to determine when a unit is in need of fire treatment. The BWWMA managers are able to use vegetative documentation and species occurrence to provide guidelines for management.

In Florida, fire frequency and season of fire have received considerable attention from researchers for maintaining plant communities and meeting the needs of varied wildlife species. However, the impact of fire extent (size of individual fires) on wildlife and plant species has only recently begun to be documented and explored. In theory, once the scale of management surpasses the behavioral adaptations and physiological ability of a species to respond to change, their populations could be negatively impacted.

The current burn program on BWWMA was developed in 2011 in cooperation with Tall Timbers Research Station to experimentally address the effect of fire extent on northern bobwhite populations, demographics, and habitat use (Figures 2 and 3). Three treatment approaches were designed to inform management: small scale (200-400 ac.) alternating patch, strip, and large scale (>3,000 acres).

Strip burns represent a compromise between burn extent and increased interspersions; the goal being to avoid displacing bobwhites from their home range but allow for larger sized burns. Researchers allocated two management zones to each of the treatment approaches minus the large scale. Researchers hope to determine which of the three approaches BWWMA will ultimately adopt. This will be based on conclusive evidence for greatest quail productivity, survival rate, and chick growth.

Besides fire frequency, it is also necessary to understand some measure of fire complexity, or fire intensity. A mosaic of fire intensity occurs in many units because of vegetation that naturally burns with different intensities and at different intervals. This provides a mosaic of fire intensity, thus vegetative structure, since some areas within a unit might not have enough fuel to carry fire. Other factors to consider when determining the fire return interval for a particular unit are: the unit's proximity to housing, exotic species populations in the unit, disturbance, research

and restoration projects, weather factors and the location of the unit in respect to other units. Any one of these factors could provide a rationale for changing the fire return interval.

IMPLEMENTATION

Most of BWWMA and the YPU is subdivided into units by disked firelines (Figures 4 and 5). In most cases, the existing lines are all that is needed to define burn units, however a limited number of new firelines may be necessary. Natural wetlands also act as firelines in some areas; however this is minimal given that most units are primarily uplands. Units range in size from less than 10 acres to over 600.

Mechanical preparation

Snags within falling distance of firelines are felled, sometimes on both sides of the fireline. While this may disturb some native species that use snags, the flammability of standing snags creates a safety risk for the fire crew as well as a potential for escape due to spot overs.

Firelines are disked if there is enough vegetation growing in them to carry a fire. Perimeter firelines may be disked not only as prep for prescribed fire activities but also to help stop unplanned fires. Perimeter lines are usually 1-2 passes wide; interior lines are usually only one pass.

Equipment

- 1 – 500 gal pumper unit on an F450 4x4
- 1 – 300 gal pumper unit on an F550 4x4
- 1 – 100 gal pumper unit on a trailer
- 4 – 8 gal ATV mounted fire torch units
- 1 – 3 pt disk harrow
- 3 – clevis mounted 10' disk harrows
- 7 – hand held radios
- 1 – transport with dozer and fire plow
- 5 – ¾ ton 4x4 pick-up trucks with mobile radios and winches
- 4 – back-up ATVs
- 5 –tractors (2 John Deere 8120s, 2 John Deere 6420s, and 1 New Holland 6610)

Mandatory Personal Protective Equipment

Nomex jacket (or equivalent), hardhat, fire shelter, gloves, and boots

Seasonality

Due to the complex nature of the BWWMA fuel loading, burns are conducted following the plan established in 2011 for dormant and growing season fire. When necessary, critical management

zones, such as along cypress strands, are burned during the growing season when rain and standing water.

Day of Burn/Permits and Notifications

A checklist is used for making sure everything is ready on the morning of a burn (Appendix 1). The weather forecast is obtained from the FL Forest Service (via phone or internet), an authorization is requested from their dispatch, equipment is readied, and site maps are printed out. Once the entire crew is at the burn site, a briefing takes place to explain the burn, possible problem areas, safety zones, expected fire behavior, lighting patterns and expected weather. Prescribed burning is generally conducted during daylight hours. Fires are set as early as possible during the day and are extinguished before sunset.

Firing Techniques

A variety of firing techniques are used depending on fuel type and desired intensity. To achieve the desired results, a variety of intensities may be used depending on each block's habitat characteristics. Back fires will be used during initial burns within flatwoods to reduce fuel loading while minimizing damage to the overstory. After the initial burn, a variety of firing techniques will be used to create a mosaic of vegetation types in different stages of growth.

Smoke Management

Smoke management is a primary concern on the BWWMA and YPU due to the proximity of smoke sensitive areas including airports, major roads, hospitals, and residential areas. Prescribed burning is conducted only when weather conditions are favorable to reduce the impact of smoke (i.e. slightly unstable atmosphere, favorable wind direction and wind speeds, mixing height of >1,700 feet). Additional measures may need to be taken depending on the abundance of homes in close proximity to targeted areas. Public education will continue to serve as a valuable tool to engender public support for fire and reduce smoke sensitivity of neighbors.

MONITORING AND REPORTING

Monitoring is required to make sure the goals of the fire program are being met. Photo points are taken at documented locations to record the change in vegetative structure over time. All burns are entered into the FWC Land Management Information System database monthly.

A fire report (evaluation) is generated after each prescribed fire in order to document the activities of the day and to note any unusual happenings. See evaluation on the prescribed burning plan (Appendix 2), for a sample fire report completed to show the typical information recorded.

Babcock Webb WMA (BWWMA) and the Yucca Pens Unit (YPU)

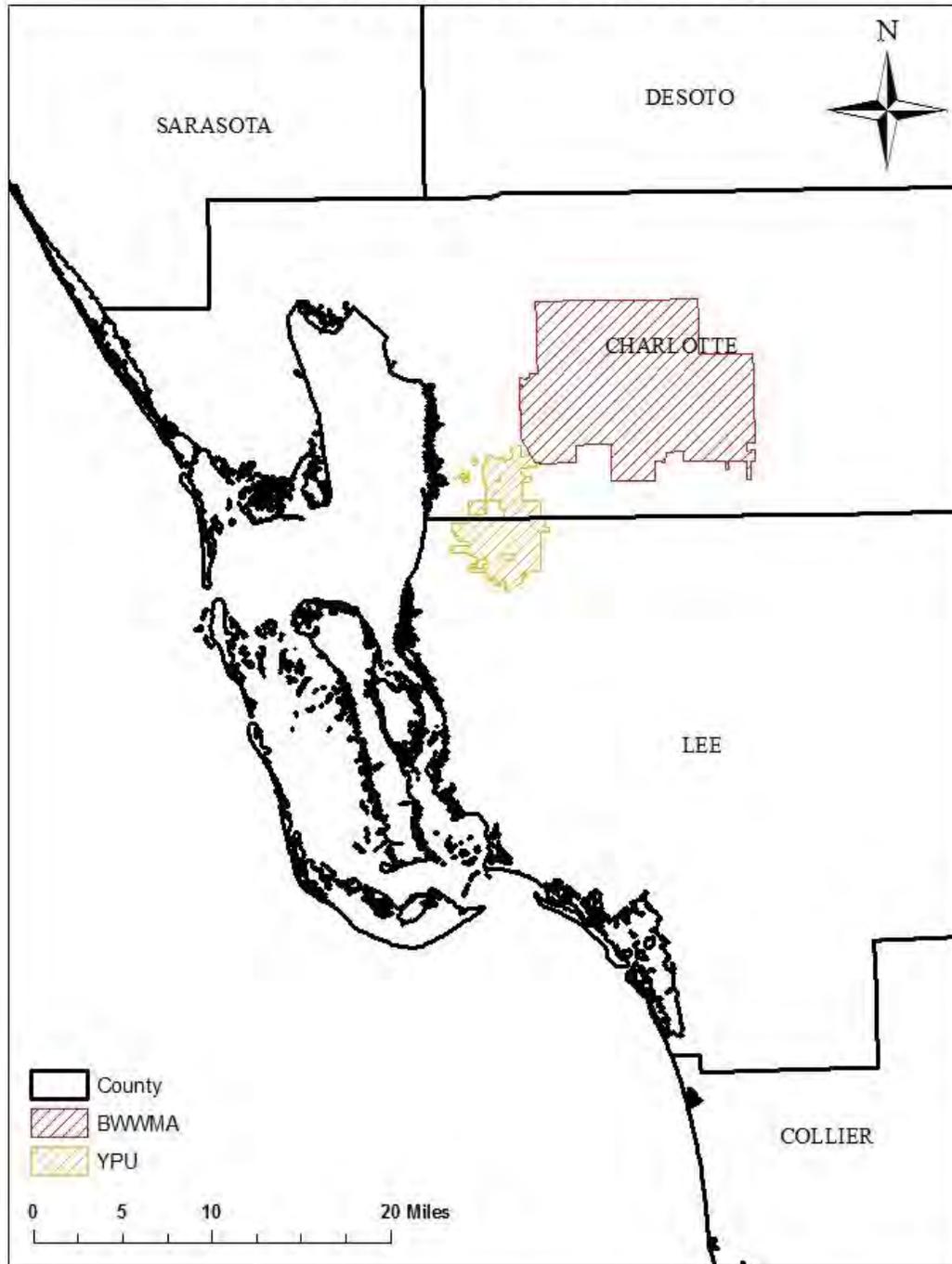


Figure 1.

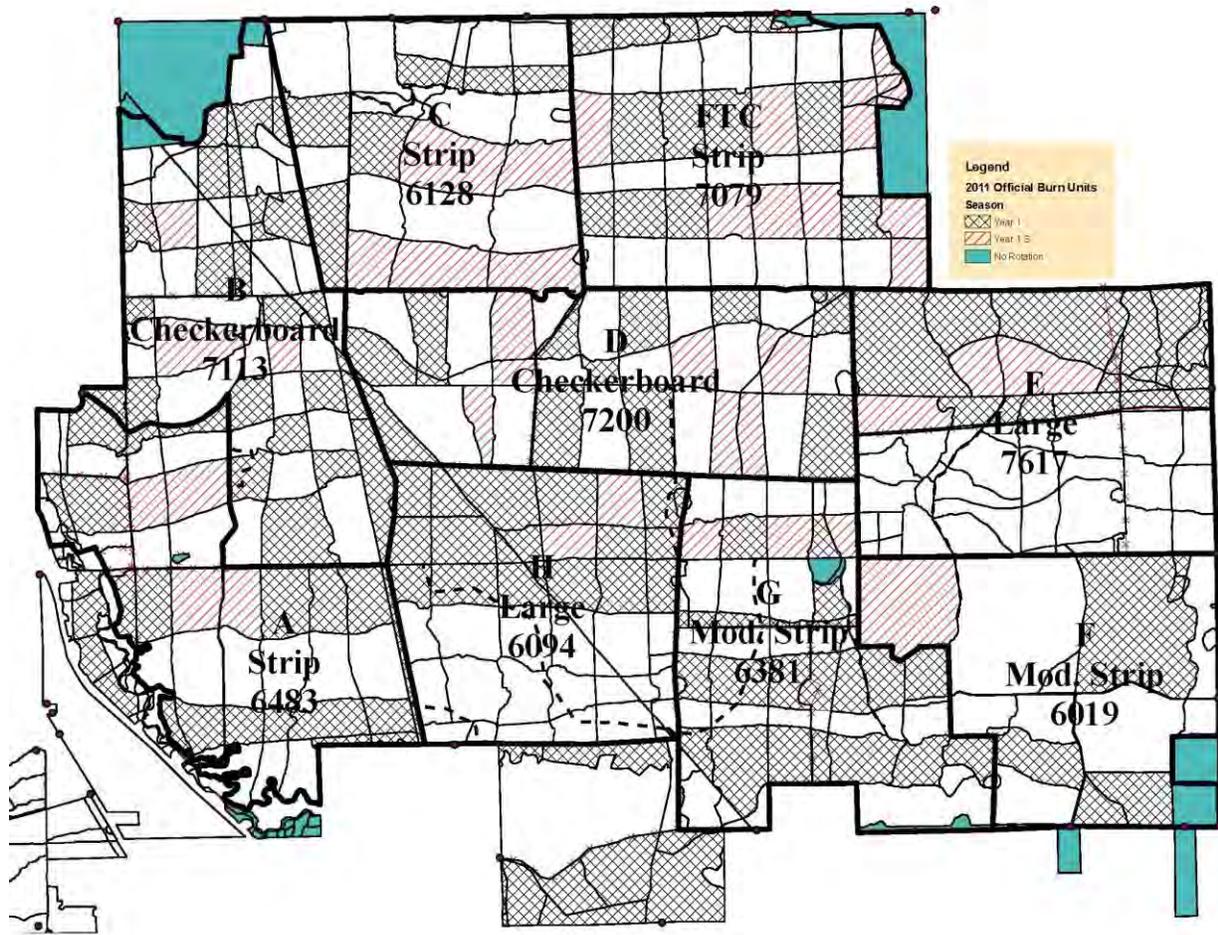


Figure 2. BWWMA Burn Units Year 1

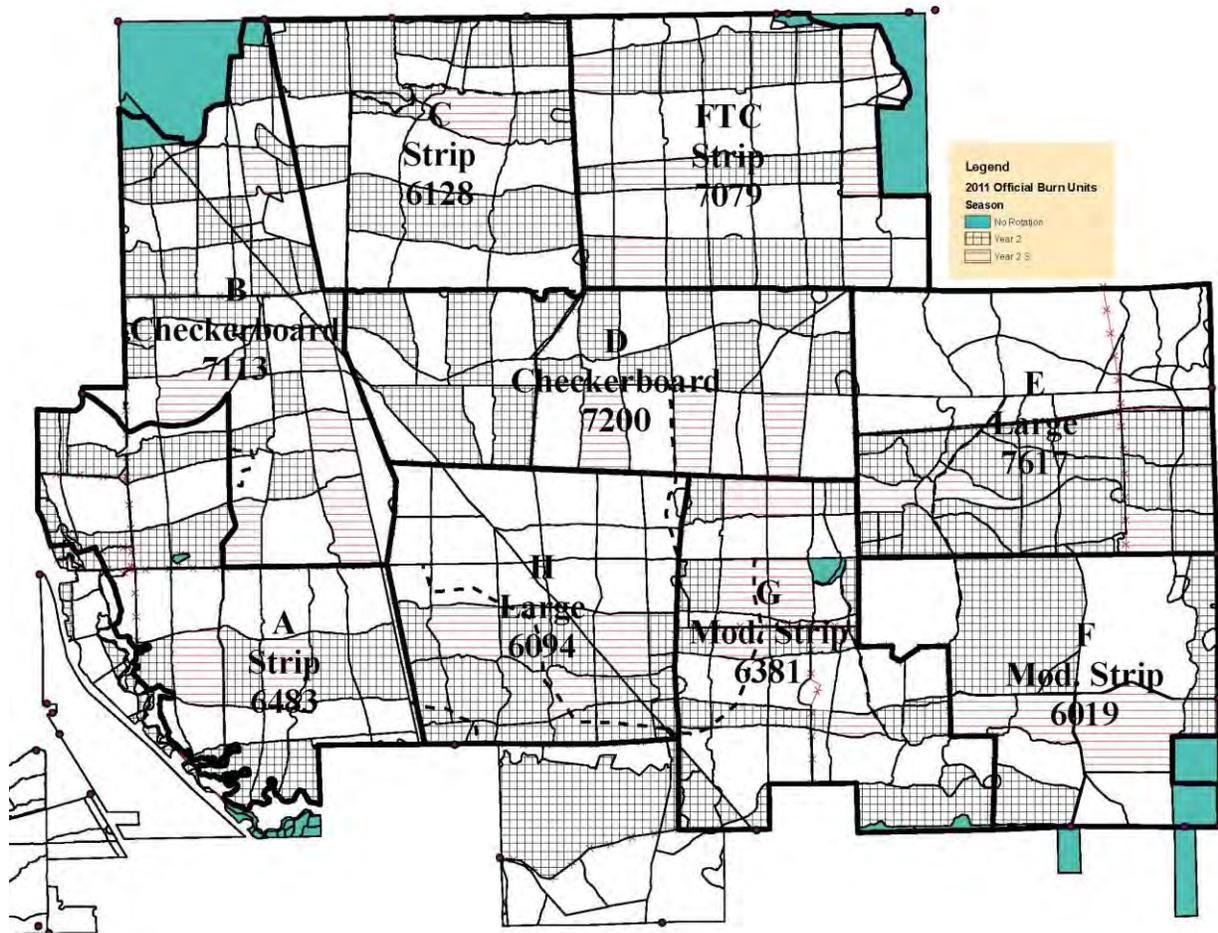


Figure 3. BWWMA Burn Units Year 2

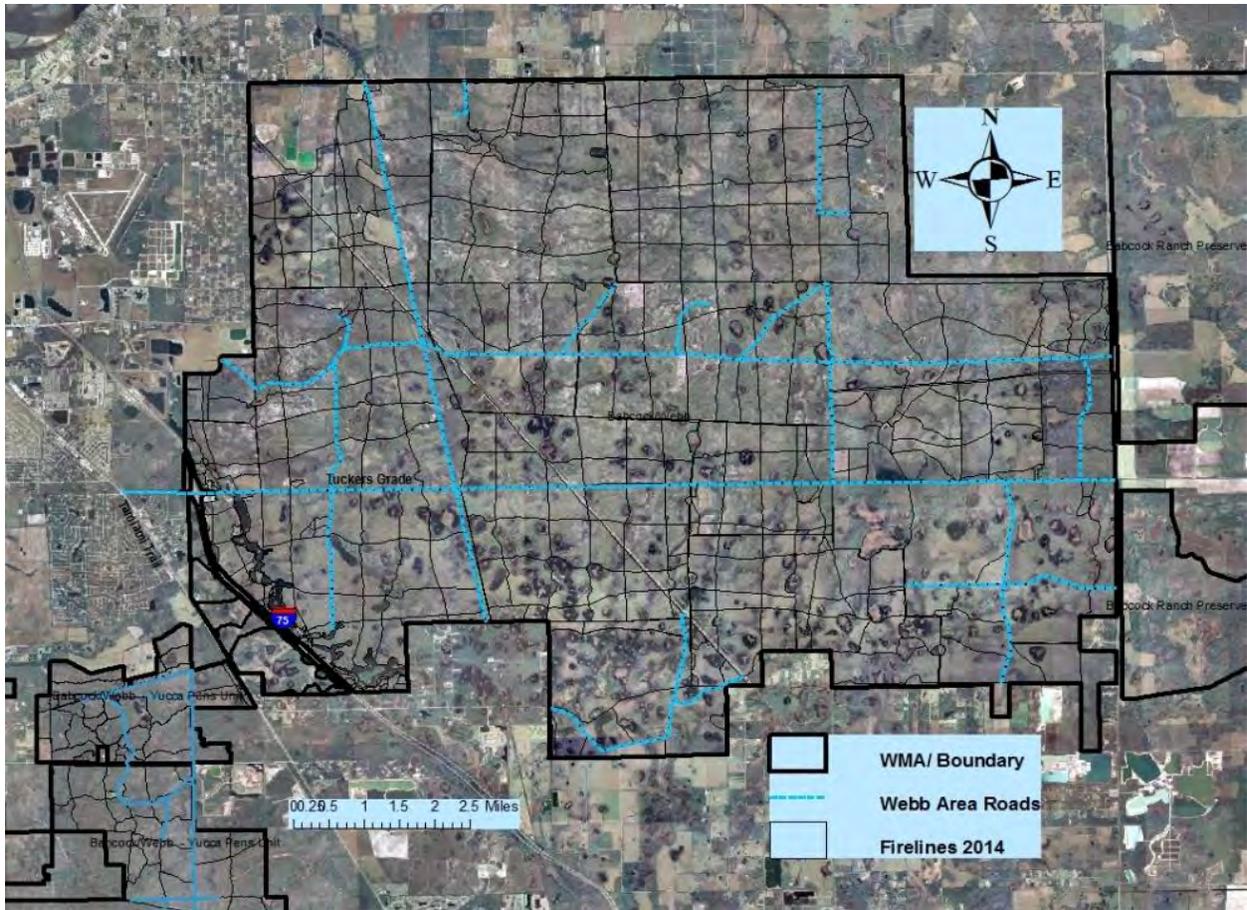


Figure 4. BWWMA Fire lines

Babcock/Webb Yucca Pens Unit

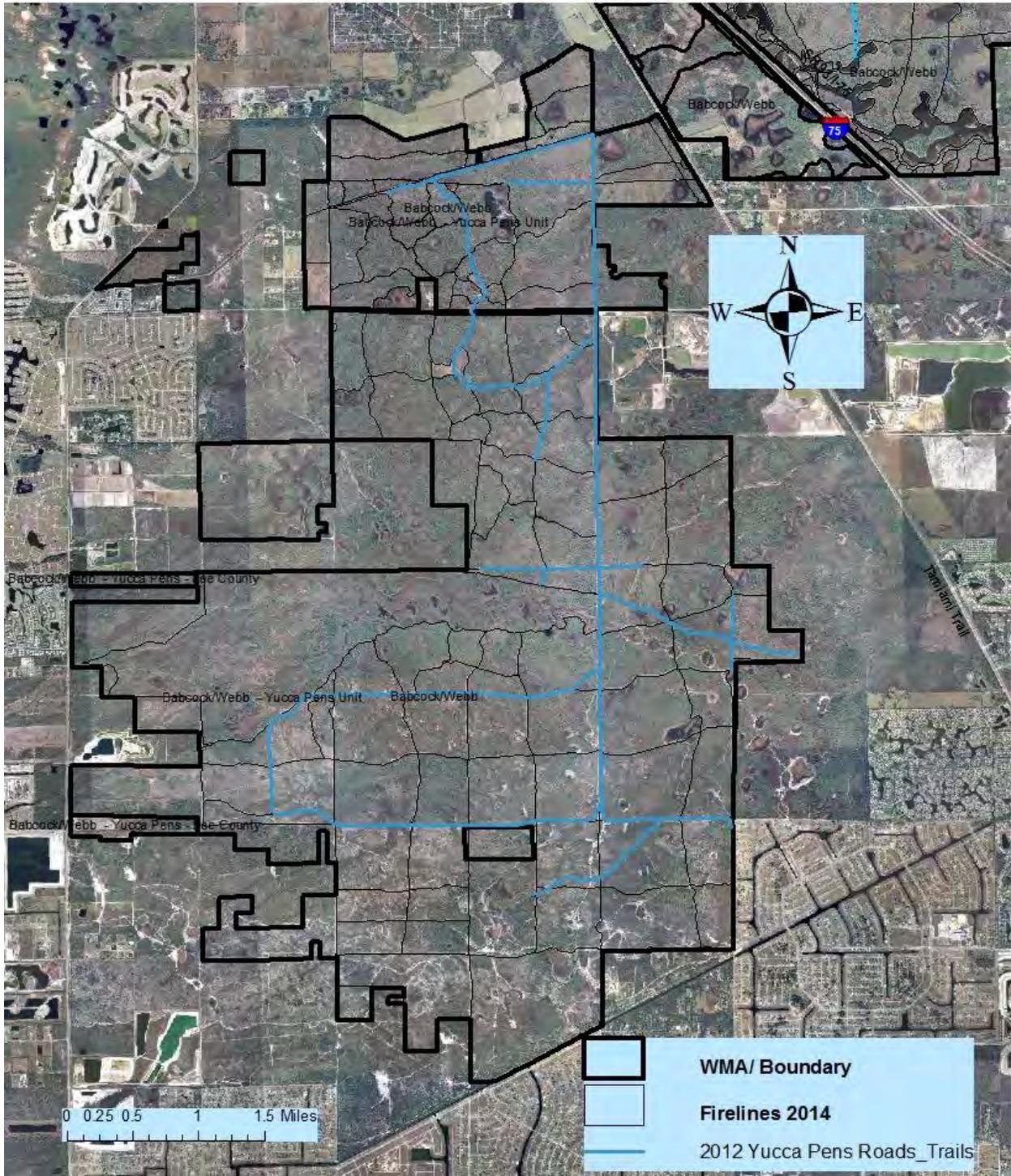


Figure 5. YPU Fire lines

Appendix 1. Day of Burn Checklist

PRE-BRIEFING

- ___ Assemble past and current weather conditions
- ___ FFS forecast attached
- ___ Obtain permit (941-751-7629/Bradenton or 239-694-5579/Lee) Landowner number 9675
- ___ Rx burner number
Mike Kemmerer 19870419
Frank Lewis 19952610
Cason Pope 20013064
Joshua Birchfield 1358116
- ___ Call FFS in Bradenton or Fort Myers (see above) – inform them if there is a possibility of smoke on roads
- ___ Call Charlotte or Lee County Sheriff Dispatch (639-2101/239-477-1200) – inform them if there is a possibility of smoke on roads
- ___ Other emergency numbers
- ___ Set up photo points for site

BRIEFING

- ___ Predicted weather
- ___ Equipment (radios, vehicles etc.)
- ___ PPE (Nomex, hard hat, gloves etc.)
- ___ Burn objectives and strategies, listed species consideration

Appendix 2.

		BABCOCK/WEBB WMA PRESCRIBED BURNING PLAN			
		LANDOWNER: Florida Fish & Wildlife Conservation Commission			
		29200 Tucker Grade / Punta Gorda FL 33955			
		941-833-2555			
Landowner No.: 9675	County / Area	Charlotte – Lee / Webb – Yucca Pens		DOF Authorization #:	
Acres	Previous Burn Date	Nov – April /	Burn Purpose	Wildlife, Haz. Red.	
Burn Objectives: Reduce the palmetto/wire grass understory by 50%-70%, Keep crown scorch to less than 50%, Increase native grass for forage,					
STR					
Burn Unit Nam					
Prescribed Burner #/ Customer#	Mike – 19870419/1305637 ; John – 19870418/1305636 ; Frank – 19952610/1306048; Cason – 20013064/1306237 ; Heath - 2009-4003/1358115; Josh - 2009-4004/1358116				
STAND DESCRIPTION					
Overstory Type & Size	South Florida Slash Pine	Height to Bottom of Crown	20 Ft.		
Understory Type & Size	Palmetto/Wiregrass – Palmettos low growing – with interspersed ponds				
Dead Fuels: Description and Amount					
PREBURN FACTORS					
Manpower & Equipment:					
Smoke Sensitive Areas (Map Locations):					
Special Precautions					
Hours to Complete	Passed Smoke Screening System				
Adjacent Landowners to Notify					
IMPORTANT NUMBERS		✓	CHECK BOX AFTER CALLING PRIOR TO BURN		✓
DOF - Rick - 941-737-9053			POWER LINES		Smoke
DOF - Punta Gorda - 941-575-5737			FPL - Reggie Gross - 941-628-1428	Highway Patrol - 239-278-7100	
Myakka - 941-751-7627 or 7629			Seminole - Jeff Conaway - 800-321-6274 x1216 or 727-963-2844	State Roads – 239-656-7800 (41, I-75, 31)	
Caloosahatchee - 239-690-3502/3503				County Rds. –	
Charlotte Dispatch - 941-639-0013				Charlotte – 204-2732 or 204-2739	
Lee County SO - 239-477-1000				Lee – 239-694-7600	
Cape Coral Disp. - 239-574-3223					
WEATHER FACTORS		DESIRED RANGE		PREDICTED	ACTUAL
Maximum Temperature		85°F			
Minimum Relative Humidity		35%			
Surface Wind Speed & Dir.		Minimum 6mph Maximum 17 Direction site dependent			
Dispersion Index		Webb: 35-68 Yucca Pens: 45-68			
Minimum Mixing Height		1600 ft			
Transport Wind Speed & Direction		Minimum 9mph; Direction site dependent			
Build-up		Acceptable Range			
Spread		Acceptable Range and Combination			
Drought Index		Acceptable Range			
Fine Fuel Moisture		10% Minimum			

FIRE BEHAVIOR		DESIRED RANGE		ACTUAL	
Fire Type		Backing, Flank, Spotheads &/or Head			
Best Month to Burn		Year round		Date Burned:	
Flame Length		4 - 12 feet			
Rate of Spread		1 - 7 chains per hour			
Inches of Litter to Leave		0			
EVALUATION:			Immediate		
Any Escapes:		Acreage:		Evaluation By:	
Objective Met:		Smoke Problems :		Date:	
% of Area With Crown Discoloration: 5-25%, 26-50%, 70%+			Insect/Disease Damage:		
Live Crown Consumption:			Tree Mortality:		
Adverse Publicity:			% Understory Kill:		
Technique Used OK:			Other Adverse Effects:		
Remarks:			Remarks:		

BURN CHECK LIST

Fire Boss: Check each item to indicate compliance								
<input type="checkbox"/>	All prescription requistes met							
<input type="checkbox"/>	Authorization obtained							
<input type="checkbox"/>	Adjacent landowners notified within past seven days of plan to burn							
<input type="checkbox"/>	Local contacts made day of the burn to advise (FHP,SO,Fire Dept., media etc.)							
<input type="checkbox"/>	Smoke screening performed and documented							
<input type="checkbox"/>	All equipment required on scene and fully operational							
<input type="checkbox"/>	Each crew member has proper personal gear and clothing							
<input type="checkbox"/>	Smoke on the Highway signs in place, if needed							
<input type="checkbox"/>	Test burn performed and fire behavior within expectations							

CREW BRIEFING

<input type="checkbox"/>	Objectives of burn							
<input type="checkbox"/>	Exact area of burn							
<input type="checkbox"/>	Hazards disscussed							
<input type="checkbox"/>	Crew assignments made							
<input type="checkbox"/>	Ignition technique and patern, Holding(s) method							
<input type="checkbox"/>	Location of extra equipment, fuel water, vehicle keys							
<input type="checkbox"/>	Authority and communications							
<input type="checkbox"/>	Contingencies covered including escape routes or procedures							
<input type="checkbox"/>	Sources of nearest assistance, Nearest phone and emergency numbers							
<input type="checkbox"/>	Specical intructions regarding smoke management, contact with the public and others							
<input type="checkbox"/>	Questions							
<input type="checkbox"/>	Crew members given opportunity to decline participation							

Prescription Made By:							
Title:					Date:		
Certified Burn Manager Signature							

10 BWWMA Recreation Master Plan

PENDING COMPLETION

11 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.

Establishment of Apiary Sites on WMA/WEA

During the development of an individual WMA/WEA Management Plan, apiaries will be considered under the multiple-use concept as a possible use to be allowed on the area. "Approved" uses are deemed to be in concert with the purposes for state acquisition, with the Conceptual State Lands Management Plan, and with the FWC agency mission, goals, and objectives as expressed in the agency strategic plan and priorities documents. Items to consider when making this determination can also include:

- Were apiaries present on the area prior to acquisition?
- Are there suitable available sites on the WMA/WEA?
- Will the apiary assist in pollination of an onsite FWC or offsite (adjacent landowner) citrus grove or other agricultural operation?

For those WMA/WEAs that have not considered apiaries in their Management Plan, upon approval of this policy Regional Staff will work with the Conservation Acquisition and Planning (CAP) staff and THCR Section leadership to determine if apiaries are an approved use on the area. If apiaries are considered an approved use then a request will be made to the Division of State Lands to allow this use as part of an amended Management Plan. This request will be made through the THCR's Section Leader's office and coordinated by the CAP.

Determination of apiary site locations on WMA/WEAs should be done using the following guidelines:

- Apiary sites should be situated so as to be at least one-half mile from WMA/WEA property boundary lines, and at least one mile from any other known apiary site. Exceptions to this requirement must be reviewed by the Area Biologist and presented to the THCR Section Leader for approval.
- Site should be relatively level, fairly dry, and not be prone to flooding when bees would normally be present.
- Site should be accessible by roads which allow reasonable transfer of hives to the site by vehicle.
- If a site is to be located near human activity, such as, an agricultural field, food plot, wildlife opening, campsites, etc., or if the site may be manipulated by machinery at a time when bees would be present, then the apiary site should be located at a minimum of 150 to 200 yards from the edge of that activity. This will ensure minimal disturbance to the bees and minimize incidents with anyone working in the area.

- It is preferable to have apiary sites located adjacent to or off roads whenever possible. If traditional apiary sites were located on roads and the Area Biologist determines that the site will not impact use of the road by visitors then it will be allowed.
- FWC Area Biologist shall select apiary site(s) and the site(s) selected should not require excessive vegetation clearing (numerous large trees, dense shrubs) or ground disturbance (including fill).

WMA/WEA Staff Responsibilities

Area Biologist on WMAs/WEAs with approved apiary sites will forward a GIS shapefile depicting all the apiary site polygon(s), including a name or number with coordinates for each apiary site, to the THCR Contract Manager.

Area Biologist will monitor each apiary site no less than once a year to determine if the beekeeper is abiding by the contract requirements. If violations are noted, staff should bring them to the attention of the beekeeper for correction. If violations continue staff should notify the THCR Contract Manager who will determine if or what additional action is warranted.

Area Biologist will establish and maintain firelines around the apiary site to ensure the apiary site is ready when a planned burn is scheduled.

Area Biologist will advise the beekeeper of burn plans, road work, gate closures, or other site conditions and management activities that may affect the beekeeper's ability to manage or access the apiary site.

Area Biologist is not responsible to ensure access roads are in condition suitable for beekeepers to access their hives with anything other than a four wheeled drive vehicle. (The site of the apiary may be high and dry, but the roads accessing them may be difficult to impossible to get a two wheeled drive vehicle into during extreme weather, e.g., heavy rainfall events.)

Apiary Wait List and Apiary Application

An electronic waiting list for apiary sites will be maintained by the THCR's Contract Manager for each WMA/WEA. To be placed on the waiting list an interested beekeeper must submit an apiary application form to the contract manager (See Enclosed Application Form). Each applicant will be considered based on the following criteria:

- Proof of a valid registration with the FDACS/DPI.
- Proof of payment of outstanding special inspection fees for existing sites.
- A validated history of being an apiary manager.
- Three references that can attest to the applicant's beekeeping experience.

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

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

Contracts

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

Pricing of Apiary Site(s)

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

Pricing examples:

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

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

Bear Depredation Control at Apiary Site(s)

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

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

SUBJECT MATTER REFERENCES

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

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

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

Attachments

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

Sample Apiary Site Application Form W/Mission Statement

Best Management Practices for Maintaining European Honey Bee Colonies

Sample of Random Selection Process Procedure

APPROVED:

Division Director or Designee

DATE: _____

APIARY AGREEMENT

AGREEMENT FOR APIARY ACTIVITIES ON STATE LANDS

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

WITNESSETH

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

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

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

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

4. The parties mutually agree:

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

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

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

This Area Intentionally Left Blank

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

USER SIGNATURE

Date: _____

Witness

Witness

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

Mike Brooks, Section Leader
Terrestrial Habitat Conservation and
Restoration

Date: _____

Approved as to form and legality

Commission Attorney

Date: _____

AGREEMENT
ATTACHMENT 1

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

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

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

Understanding Electric Fencing

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

Components of Electric Fencing

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

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

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

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

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

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

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

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

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

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

Recommended Electric Fence to Deter Black Bears

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

Materials:

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

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

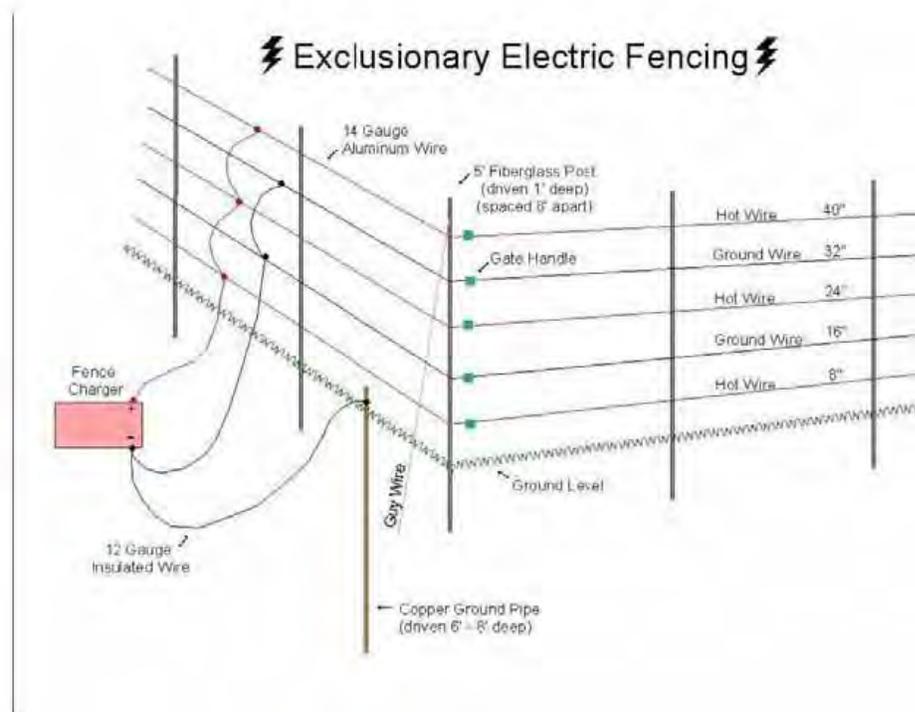
corresponding loop on the first corner post. Drive in the remaining 16 posts to the same depth at 8-foot intervals between corner posts. Secure each of the five wires to each of the posts with additional wire. Attach four plastic electric fence signs (one on each side) to the top wire of the fence. Attach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

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

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

LITERATURE CITED

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



AGREEMENT
ATTACHMENT 2

Place Holder for Map

Of

Apiary Locations

At

WMA/WEA

APIARY SITE APPLICATION FORM

Florida Fish and Wildlife Conservation Commission

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

Name _____ Telephone Number _____

Mailing Address _____

City or Town _____ County _____ Zip Code _____

Physical Address (If Different from Mailing Address) _____

Company Name: _____

Email Address _____

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

WMA/WEA _____ County _____ # of Sites _____

WMA/WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

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

Member of Beekeepers Association: Yes ___ No ___

Number of Years a Member _____

Name of Beekeepers Association: _____

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

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

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

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

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

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

MISSION STATEMENT

Management

Of

Florida Fish and Wildlife Conservation Commission's

Wildlife Management Areas

And

Wildlife and Environmental Areas

The mission of the Florida Fish and Wildlife Conservation Commission (FWC) is to manage fish and wildlife resources for their long-term well-being and the benefit of the people. To aid in accomplishing this mission, one of FWC's management goals is to manage fire-adapted natural communities on our Wildlife Management and Environmental Areas (WMA/WEA) to support healthy populations of the plants and animal's characteristic of each natural community. In order to achieve this goal various habitat management techniques are used. These include prescribed burning, applications of herbicides and mechanical treatment of vegetation. These management efforts will take place at various times and locations on each of the FWC's WMA/WEAs. Staff on each WMA/WEA will work with and make users aware of these activities when necessary. Users must be aware and accept that these activities are necessary for the proper management of the area.

Note: This document is included as an attachment with each Application and executed Contract.

FDACS/DPI's BMP

Florida Department of Agriculture & Consumer Services

BEST MANAGEMENT PRACTICES FOR

MAINTAINING EUROPEAN HONEY BEE COLONIES

1. Beekeepers will maintain a valid registration with the Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI), and be current with any and all special inspection fees.
2. A Florida apiary may be deemed as European Honey Bee with a minimum 10% random survey of colonies using the FABIS (Fast African Bee Identification System) and/or the computer-assisted morphometric procedure (i.e., Universal system for the detection of Africanized Honey Bees (AHB) (USDA-ID) or other approved methods by FDACS on a yearly basis or as requested.
3. Honey bee colony divisions or splits should be queened with production queens or queen cells from EHB breeder queens following Florida's Best Management Practices.
4. Florida beekeepers are discouraged from collecting swarms that cannot be immediately re-queened from EHB queen producers.
5. Florida Beekeepers should practice good swarm-prevention techniques to prevent an abundance of virgin queens and their ready mating with available AHB drones that carry the defensive trait.
6. Maintain all EHB colonies in a strong, healthy, populous condition to discourage usurpation (take over) swarms of AHB.
7. Do not allow any weak or empty colonies to exist in an Apiary, as they may be attractive to AHB swarms.
8. Recommend re-queening with European stock every six months unless using marked or clipped queens and having in possession a bill of sale from an EHB Queen Producer.
9. Immediately re-queen with a European Queen if previously installed clipped or marked queen is found missing.
10. Maintain one European drone source colony (250 square inches of drone comb) for every 10 colonies in order to reduce supercedure queens mating with AHB drones.
11. To protect public safety and reduce beekeeping liability, do not site apiaries in proximity of tethered or confined animals, students, the elderly, general public, drivers on public roadways, or visitors where this may have a higher likelihood of occurring.
12. Treat all honey bees with respect.

RANDOM
SELECTION PROCESS
FOR VACANT APIARY SITE

When an apiary site becomes available the following procedure is used to randomly select the next apiarist (beekeeper) for an available apiary site on a WMA or WEA. Only those who have been evaluated and deemed qualified to be an apiarist on a WMA/WEA through the Apiary Application process will be eligible for this selection process. The steps below will be followed by the THCR Contract Manager when a site becomes available to be filled by a qualified apiarist:

1. The THCR Contract Manager will maintain an "Apiary Wait List Folder" on the THCR SharePoint for each WMA/WEA with apiary sites.
2. A wait list is either created or updated when an Apiary Application(s) is received by the THCR Contract Manager from a qualified apiarist.
3. Upon receipt of an apiary site application, the THCR Contract Manager will review the WMA/WEA folder to see if there is an "Apiary Wait List".
4. If a list exists then the qualified applicant will be added to the list.
5. When an apiary site becomes available if there are more than one qualified apiarist then these apiarists will be contacted by certified letter to determine their interest.
6. The letter will request a response within 10 working days to make them eligible for the random drawing.
7. If there is no response or is negative then that apiarist will not be included in the random drawing and the name will be removed from the waiting list*.
8. If only one apiarist responds positively to the certified letter then the available site will be awarded to that interested apiarist.
9. If there are no apiarists on a wait list or all responses are negative then apiarists who currently have site(s) under Agreement and where not on the waiting list will be contacted to see if any have interest in the available site. If more than one responds then the random drawing process will be used to determine who will be awarded the site.

10. Steps to be performed by the THCR Contract Manager to execute the random selection for an available apiary site are listed below:

- a. The names of each interested apiarist will be noted on a 1" X 2" piece of paper and folded in half.
- b. The pieces of paper will be inserted into a "black film canister" which has a snap top and placed into a container and stirred up prior to the selection.
- c. A non-biased person will be selected to reach into the bowl (which will be held above the selection person's eyesight) and randomly select one of the canisters.
- d. The canister will be opened by the person performing the selection and the name is read aloud for those in attendance. Everyone in attendance will sign a witness sheet.
- e. The apiarist whose name is selected will be awarded the available site.
- f. A new Agreement will be developed by the THCR Contract Manager.

*A new apiary application must be submitted once requestor's name is removed from a waiting list.

12 DHR Management Procedures and Master Site File List

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

Environmental Resource Analysis

Cultural Resources

Analysis Shape Type: Polygon

Analysis Timestamp: 10222014 11:24:58

Shape Name: Unnamed polygon centered at -81.898521 °, 26.828857 °

Boundary Area: 82614.17 acres

Buffer Area: 0 acres

Total Area: 82614.17 acres

Cultural Resources										
Florida Sites										
SITE NAME	SITEID	SITETYPE1	SITETYPE2	SITETYPE3	SITETYPE4	SITETYPE5	SITETYPE6	HUMANREMN	Total Area (acres)	Percent of Area
OIL WELL ROAD	CH00066	Campsite (prehistoric)	Land-terrestrial	Prehistoric midden(s)	Artifact scatter-low density (< 2 per sq meter)				1.21	0 %
TOTAL:									1.21	0 %
Florida Structures										
No Records Found										
Historical Cemeteries										
No Records Found										
Historic Bridges										
No Records Found										
National Register of Historic Places										
No Records Found										
Resource Groups										
SITE NAME	SITEID	Total Area (acres)		Percent of Area						
Bermont Road	CH02062	38.49		0.05 %						
James Loop Road	CH02059	2.54		0 %						
Seaboard Air Line	CH02055	55.74		0.07 %						
Seminole Gulf Railway	CH00649	22.08		0.03 %						
SR 31	CH02159	25.48		0.03 %						
Tuckers Grade	CH02158	60.89		0.07 %						
		TOTAL:		214.68		0.26 %				

Field Survey		
TITLE	Total Area (acres)	Percent of Area
Cultural Resource Survey of the Punta Gorda Wastewater Land Application Site	721.64	0.87 %
Archaeological Reconnaissance of City of Punta Gorda's Proposed Force Main Route	7.44	0.01 %
An Archaeological and Historical Survey of the Hardee Power Station Transmission Line.	367.26	0.44 %
An Amendment to the Report on the Archaeological and Historical Survey of the Hardee Power Station Transmission Line	0.31	0 %
Cultural Resource Assessment Survey of the Southwest Florida Pipeline Company Corridor, Hillsborough, Polk, DeSoto, Charlotte, and Lee Counties, Florida	33.93	0.04 %
A Cultural Resource Assessment Survey of the Southwest Florida Pipeline Company Corridor Realignment, DeSoto, Charlotte, and Lee Counties, Florida	51.59	0.06 %
Annual Progress Report of the Cooperative Agreement Between the Florida Department of Transportation and The Division of Archives, History, and Records Management, Florida Department of State, 1976	143.02	0.17 %
Cultural Resource Survey and Evaluation Report of the Florida Gas Transmission Company Phase IV Expansion	8.10	0.01 %
An Archaeological and Historical Survey of the Proposed Fort Myers Tower Location in Charlotte County, Florida	300.77	0.36 %
Cultural Resource Assessment Survey Burnt Store Acres, Lee County, Florida	15.96	0.02 %
A Cultural Resource Assessment Survey SR 31 from Lee County Line to CR 74, Charlotte County, Florida	149.61	0.18 %
A Phase I Archaeological Assessment of the Bermont Road Parcel, Charlotte County, Florida	1.61	0 %
An Addendum to the Cultural Resource Predictive Model, The Babcock Ranch Community, Charlotte and Lee Counties, Florida	6.75	0.01 %
Cultural Resource Assessment Survey I-75 PD&E Study from SR 78 to North of Kings Highway Lee and Charlotte Counties, Florida	51.35	0.06 %
Phase I Cultural Resource Survey of the Residences at Burnt Store East Property, Charlotte County, Florida	10.60	0.01 %
Phase II of the Survey of Historic Resource, Charlotte County, Florida	73,500.93	88.97 %
Cultural Resource Assessment Survey Bermont Road Excavation, Charlotte County, Florida	5.78	0.01 %
TOTAL:	75,376.66	91.24 %

13 FWC Agency Strategic Plan

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

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

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

Strategies:

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

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

Strategies:

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

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

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

Strategies:

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

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

Strategies:

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

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

Strategies:

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

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

Strategies:

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

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

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

Strategies:

1. Expand and promote the Florida Youth Conservation Centers Network through leveraging FWC programs and staff, and developing public and private partnerships and sponsorships.

2. Develop and deliver standardized youth conservation curricula and fishing, hunting, boating and wildlife viewing outdoor activity programs, and assist with adapting programs and curricula to meet the needs of diverse communities.
3. Foster stewardship and shared responsibility for fish and wildlife conservation through conservation education programs.
4. Expand marketing and outreach to reach diverse audiences and engage all staff in priority outreach initiatives.

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

Strategies:

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

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

Strategies:

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

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

Strategies:

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

Theme Four – Responsive Organization and Quality Operations

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

Strategies:

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

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

Strategies:

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

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

Strategies:

1. Address emerging biological, social and economic trends, anticipate impacts and take advantage of opportunities to accomplish FWC's mission.

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

14 Land Management Uniform Cost Accounting Terms

Land Management Uniform Cost Accounting Council

Uniform Land Management Cost Categories and Subcategories

1. Resource Management

- a. Exotic Species Control. -- Invasive exotic plant and animal removal activities and costs for inventorying, planning, preparing, executing, evaluating, monitoring and reporting. Also includes equipment, chemicals, protective clothing and supplies. Includes nuisance native feral animal and plant control.
- b. Prescribed Burning. -- Prescribed burning activities and costs for assessing, planning, preparing, executing, evaluating and reporting. Also includes equipment, protective clothing and supplies.
- c. Cultural Resource Management. -- Management activities and costs for assessing, planning, executing, evaluating and reporting, and for all maintenance, restoration or monitoring activities for prehistoric and historic sites, features and collection objects.
- d. Timber Management. -- Activities and costs related to the establishment of a stand of potentially merchantable timber, harvest of merchantable timber, and cultural treatments intended primarily to improve the growth and overall health of a stand of merchantable timber. Also includes activities and costs related to the cutting of merchantable timber in natural community and habitat restoration projects.
- e. Hydrological Management. -- Hydrological management and restoration activities and costs for assessing, monitoring, planning, preparing, executing, evaluating and reporting. Includes water level management, repair, removal or back-filling of ditches, canals, berms and dams. Also includes water quality and water quantity monitoring.
- f. Other. -- All other resource management activities and costs not captured in other specific subcategories. Examples include natural community and habitat restoration through other techniques; plant, animal or biological community survey, monitoring and research; listed species management; technical assistance; and evaluating and commenting on resource impacts to parks.

2. Administration

- a. Central Office/Headquarters. -- Headquarters units conducting general administration of land under management by the agency. Includes upper management direction, administration and fiscal, budget, personnel, purchasing and record keeping required for operations oversight and specific programs. Includes all duties unless they specifically relate to other categories or subcategories.
- b. Districts/Regions. -- Sub-state administrative districts or regions conducting general administration of the properties under their management. Includes all duties, unless they specifically relate to other categories or subcategories. General operating costs of district or region administrative facilities are included.

c. Units/Projects. -- Conducting general administration duties at a specific management unit (state park, state forest, state wildlife management area, etc.). Includes supervisory duties, fiscal and record keeping duties, and any other duties that do not specifically relate to other categories or subcategories. General operating costs for the property, such as utilities, telephones and garbage collection, are included.

3. Support

a. Land Management Planning. -- Developing land management plans required by Sec. 253.034, F.S. Includes researching and compiling plan information, materials and maps, coordinating planning activities, conducting review activities (internal reviews, public meetings, advisory group meetings, ARC, etc.), and promulgating draft plans and final plans.

b. Land Management Reviews. -- Planning, organizing and conducting land management reviews by teams created under Sec. 259.036, F.S. Includes preparing and responding to land management review reports. Also includes similar work conducted as part of internal agency land management reviews.

c. Training/Staff Development. -- Staff training and development costs incurred in any facet of the agency's land management activities.

d. Vehicle Purchase. -- Acquisition of any vehicle purchased primarily for land management purposes or to support any category of land management activity by the agency.

e. Vehicle Operation and Maintenance. -- Costs of operating and upkeep of any vehicle used by the agency to support any category of land management activity.

f. Other. -- Any other support activity or cost not captured by other categories or subcategories.

4. Capital Improvements

a. New Facility Construction. -- Use of Fixed Capital Outlay (FCO) or other budget authority for all new facility design and construction activities. Includes new roads, parking and all other infrastructure.

b. Facility Maintenance. -- Use of Fixed Capital Outlay (FCO) or other budget authority for all repairs or renovations to existing facilities, roads or other infrastructure. Also includes ADA accessibility improvements and renovations.

5. Visitor Services/Recreation

a. Information/Education Programs. -- Interpretive, environmental education and marketing programs that explain or promote the agency's mission or instill in visitors an understanding and appreciation for Florida's natural and cultural resources and their proper use and care. Includes signs, brochures, maps and other public information materials that are produced or disseminated.

b. Operations. -- Includes the non-administrative and non-support costs involved in providing public access to lands. Includes all actions required to manage visitor activities in a way to ensure safe and enjoyable use by the public. Includes routine maintenance, cleaning and other work required to provide safe and efficient utilization of facilities and resources that support visitor use and recreation. Includes protection activities required by staff to safeguard natural and cultural resources, facilities, material, staff and visitors.

6. Law Enforcement

The provision of all activities for enforcing criminal, conservation and boating laws on land, freshwater and marine environments and all costs associated with these services. Includes the provision of uniform patrol. Includes overt and covert criminal investigations. Includes regulation of commercial wildlife trade. Also includes the direction and administration of all law enforcement programs and activities, and all associated costs.

Land Management Uniform Accounting Council and FWC Activity Code Groupings

Resource Management

Exotic Species Control

- 210 Exotic species control
- 211 Exotic plant control (mechanical)
- 212 Exotic plant control (chemical)

Prescribed Burning

- 205 Prescribed burning
- 206 Prescribed burning C growing season (April 1 to September 30)
- 207 Prescribed burning C dormant season (October 1 to March 31)
- 208 Firebreaks

Cultural Resource Management

- 201 Cultural resource management

Timber Management

- 202 Timber management

Hydrological Management

- 215 Hydrology management
- 216 Dams, dikes, levees
- 217 Canals
- 218 Water level management
- 194 Lake restoration

Other

- 185 GIS
- 186 Biometrics
- 200 RESOURCE MANAGEMENT
- 203 Tree and shrub planting
- 213 Wildlife management
- 214 Listed Species management
- 219 Upland restoration
- 282 Herbaceous seeding
- 283 Clearings
- 289 Native vegetation management (mechanical)
- 290 Native vegetation management (chemical)
- 221 Animal surveys
- 228 Inland aerial surveys
- 235 Vegetation and plant surveys
- 250 MONITORING AND ASSESSMENTS
- 252 Biomedical monitoring
- 253 Ecological monitoring
- 256 Habitat monitoring analysis
- 263 Nest box monitoring
- 264 Population demographics
- 295 Biological data collection, analysis, and reporting
- 275 Permits and authorizations
- 276 Commission rule development and review
- 277 Relocation
- 278 CITES tags
- 281 Other resource management
- 284 Feeding/watering
- 285 Nest structures
- 286 Population control
- 287 Stocking enhancements/population augmentation
- 288 Nuisance animal complaints

- 293 Mortality investigations
- 294 Program coordination and implementation C inter- and intra-agency coordination and program implementation at the section, bureau, or division level
- 296 Habitat protection technical assistance
- 750 URTD assessment
- 789 Site Preparation – GCR
- 790 Irrigation – GCR
- 791 Seed Collection – Hand
- 792 Seed Collection – Mechanical
- 793 Herbicide Maintenance Treatment

Administration

Central Office/Headquarters

- 100 ADMINISTRATION C administrative tasks, including preparation of forms, word processing, photocopying, filing, and other clerical/secretarial duties.
- 104 Budget/purchasing/accounting

Districts/Regions

See Location code

Units/Projects

See Location code

Support

Land Management Planning

- 103 Meetings C includes workshops, conferences, staff, and other meetings.
- 204 Resource planning

Land Management Reviews

- 209 Land Management Reviews
- 101 Project inspection C field inspections of projects.

Training/Staff Development

- 150 PERSONNEL MANAGEMENT C recruitment, hiring, training, counseling, and supervising.

Vehicle Purchase

- 128 New Vehicle and Equipment Purchase

Vehicle Operation and Maintenance

- 923 FEM C vehicles/equipment

Other

- 140 REPORT WRITING/EDITING/MANUSCRIPT PREPARATION
- 141 Grant applications
- 180 SYSTEMS ADMINISTRATION AND MANAGEMENT
- 182 Data management
- 184 Metadata development and management
- 187 IT
- 188 Web development
- 721 Geospatial analysis techniques
- 191 Stamp design coordination
- 226 Human dimensions surveys

Capitol Improvements

New Facility Construction

- 910 New facility construction C buildings/structures
- 912 New construction C roads/bridges
- 913 New construction C trails
- 914 New construction C fences

Facility Maintenance

- 920 Facility and equipment maintenance (FEM) C buildings/structures

- 921 FEM C utilities
- 922 FEM C custodial functions
- 925 FEM C boating access
- 926 FEM C roads/bridges
- 927 FEM C trails
- 928 FEM C fences

Visitor Services/Recreation

Information/Education Programs

- 145 Technical bulletin

Operations

- 311 Boundary signs
- 312 Informational signs
- 320 Outreach and education C attending or developing educational or informational materials or events for the public
- 327 Becoming an Outdoor Woman C enhancement
- 331 Wings Over Florida
- 341 Public use administration (hunting)
- 342 Public use administration (non-hunting)
- 350 Customer service support C disseminating written or verbal information or assistance to the public
- 700 STUDIES
- 740 EVALUATIONS AND ASSESSMENTS

Law Enforcement

- 191 Stamp design coordination
- 194 Lake restoration
- 200 RESOURCE MANAGEMENT
- 201 Cultural resource management
- 202 Timber management
- 203 Tree and shrub planting
- 204 Resource planning
- 205 Prescribed burning
- 206 Prescribed burning C growing season (April 1 to September 30)
- 207 Prescribed burning C dormant season (October 1 to March 31)
- 208 Firebreaks
- 209 Land Management Reviews
- 210 Exotic species control
- 211 Exotic plant control (mechanical)
- 212 Exotic plant control (chemical)
- 213 Wildlife management
- 214 Listed Species management
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- 216 Dams, dikes, levees
- 217 Canals
- 218 Water level management
- 219 Upland restoration
- 221 Animal surveys
- 226 Human dimensions surveys
- 228 Inland aerial surveys
- 235 Vegetation and plant surveys
- 250 MONITORING AND ASSESSMENTS
- 252 Biomedical monitoring
- 253 Ecological monitoring
- 256 Habitat monitoring analysis
- 263 Nest box monitoring

264	Population demographics
275	Permits and authorizations
276	Commission rule development and review
277	Relocation
278	CITES tags
281	Other resource management
282	Herbaceous seeding
283	Clearings
284	Feeding/watering
285	Nest structures
286	Population control
287	Stocking enhancements/population augmentation
288	Nuisance animal complaints
289	Native vegetation management (mechanical)
290	Native vegetation management (chemical)
293	Mortality investigations
294	Program coordination and implementation C inter- and intra-agency coordination and program implementation at the section, bureau, or division level
295	Biological data collection, analysis, and reporting
296	Habitat protection technical assistance
311	Boundary signs
312	Informational signs
320	Outreach and education C attending or developing educational or informational materials or events for the public
327	Becoming an Outdoor Woman C enhancement
331	Wings Over Florida
341	Public use administration (hunting)
342	Public use administration (non-hunting)
350	Customer service support C disseminating written or verbal information or assistance to the public
700	STUDIES
721	Geospatial analysis techniques 740 EVALUATIONS AND ASSESSMENTS
750	URTD assessment
789	Site Preparation – GCR
790	Irrigation – GCR
791	Seed Collection – Hand
792	Seed Collection – Mechanical
793	Herbicide Maintenance Treatment
910	New facility construction C buildings/structures
912	New construction C roads/bridges
913	New construction C trails
914	New construction C fences
920	Facility and equipment maintenance (FEM) C buildings/structures
921	FEM C utilities
922	FEM C custodial functions
923	FEM C vehicles/equipment
925	FEM C boating access
926	FEM C roads/bridges
927	FEM C trails
928	FEM C fences

Fiscal year 2014 Projects: 7202

Activity Title	Staff Days	Salary	FuelCost	Other	Total
100 Administration	80.00	\$16,927.20	\$1,460.00	\$20,400.00	\$38,787.20
103 Meetings	0.00	\$0.00	\$0.00	\$0.00	\$0.00
104 Budget/purchasing/accounting	0.00	\$0.00	\$0.00	\$0.00	\$0.00
128 New Vehicle and Equipment Purchases	0.00	\$0.00	\$0.00	\$0.00	\$0.00
182 Data management	10.00	\$2,115.90	\$182.50	\$100.00	\$2,398.40
200 Resource Management	22.00	\$4,654.98	\$401.50	\$0.00	\$5,056.48
203 Tree and shrub planting	10.00	\$2,115.90	\$182.50	\$35,000.00	\$37,298.40
204 Resource planning	75.00	\$15,869.25	\$1,368.75	\$3,000.00	\$20,238.00
206 Prescribed burning - growing season	90.00	\$19,043.10	\$1,642.50	\$11,000.00	\$31,685.60
207 Prescribed burning - dormant season	220.00	\$46,549.80	\$4,015.00	\$27,000.00	\$77,564.80
208 Firebreaks	57.00	\$12,060.63	\$1,040.25	\$4,000.00	\$17,100.88
212 Exotic plant control (chemical)	110.00	\$23,274.90	\$2,007.50	\$414,800.00	\$440,082.40
218 Water level management	35.00	\$7,405.65	\$638.75	\$131,000.00	\$139,044.40
219 Upland restoration	0.00	\$0.00	\$0.00	\$0.00	\$0.00
221 Animal surveys	91.00	\$19,254.69	\$1,660.75	\$84,400.00	\$105,315.44
235 Vegetation and plant surveys	8.00	\$1,692.72	\$146.00	\$200.00	\$2,038.72
282 Herbaceous seeding	73.00	\$15,446.07	\$1,332.25	\$80,000.00	\$96,778.32
289 Native vegetation management (mechanical)	68.00	\$14,388.12	\$1,241.00	\$93,000.00	\$108,629.12
294 Program coordination and implementation	0.00	\$0.00	\$0.00	\$0.00	\$0.00
295 Biological data collection, analysis, and reporting	27.00	\$5,712.93	\$492.75	\$2,100.00	\$8,305.68
311 Boundary signs	20.00	\$4,231.80	\$365.00	\$1,000.00	\$5,596.80
312 Informational signs	20.00	\$4,231.80	\$365.00	\$6,000.00	\$10,596.80
339 Range safety operations	10.00	\$2,115.90	\$182.50	\$87,000.00	\$89,298.40
341 Public use administration (hunting)	15.00	\$3,173.85	\$273.75	\$14,000.00	\$17,447.60
342 Public use administration (non-hunting)	50.00	\$10,579.50	\$912.50	\$26,000.00	\$37,492.00
920 FEM -- buildings/structures	75.00	\$15,869.25	\$1,368.75	\$46,000.00	\$63,238.00
922 FEM -- custodial functions	108.00	\$22,851.72	\$1,971.00	\$4,000.00	\$28,822.72
923 FEM -- vehicles/equipment	97.00	\$20,524.23	\$1,770.25	\$68,100.00	\$90,394.48
926 FEM -- roads/bridges	125.00	\$26,448.75	\$2,281.25	\$326,300.00	\$355,030.00
928 FEM -- fences	22.00	\$4,654.98	\$401.50	\$7,000.00	\$12,056.48
All totals	1,518.00	\$321,193.61	\$27,703.50	\$1,491,400.00	\$1,840,297.11

15 2012 NRCS BWWMA Prescribed Grazing Plan

Prescribed Grazing Plan

Prepared for



Babcock - Cecil Webb WMA

Charlotte County, Florida

*In cooperation with
Charlotte Soil & Water Conservation District
And
United States Department of Agriculture
Natural Resources Conservation Service*

Table of Contents:

1. Definition
2. Purpose
3. General Description
4. Objectives
5. Livestock Forage Inventory
6. Livestock Forage Inventory Map
7. Annual Grazing Schedule
8. Plan Map
9. Recommended Grazing Heights
10. Recommendations For Grazing Buffer Areas
11. Operations and Maintenance
12. Contingency Management Plan

1. Definition:

Prescribed grazing is a controlled harvest of vegetation with grazing and browsing animals. Prescribed grazing will be used on lands where grazing animals are managed.

For this project, prescribed grazing will be used as a tool to assist in the restoration and maintenance of a portion of the wildlife management area, in conjunction with Brush Control, Pest Management, Prescribed Burning and other practices needed to restore wildlife habitat, natural hydrology, and native plant communities. The grazing plan will be adjusted as needed to address resource concerns and the restoration objectives.

2. Purpose:

This practice will be applied as part of a conservation management system to accomplish the following objectives:

- Maintain a stable and desired plant community, improve or maintain the health and vigor of selected plants.
- Maintain or improve animal health and productivity.
- Maintain or improve water quality.

Note: This plan will be reviewed yearly by the owner/operator. If the number of livestock (10% or more) or the forage condition changes the plan may need to be revised.

3. General Description:

The Babcock-Cecil Webb WMA is located in Charlotte County. The property is leased and being managed as cow/calf grazing units. The principal forage species in the Mesic and Wet (South Florida) Flatwoods is Wiregrass (*Aristida beyrichiana*). Other plant communities include Freshwater Marshes and Sloughs, and Wet and Dry Prairie.

Pastures 2 continuous, in its current condition are capable of producing enough forage to support **309 animal units (AUs)**. The system in its present condition can support an average of **294 cows**, with an average weight of 1000 lbs., and **11 bulls**, with an average weight of 1350 lbs with a suggested 20:1 Cow/Bull ratio.

Pastures 2 rotational, in its current condition are capable of producing enough forage to support **244 animal units (AUs)**. The system in its present condition can support an average of **232 cows**, with an average weight of 1000 lbs., and **9 bulls**, with an average weight of 1350 lbs with a suggested 20:1 Cow/Bull ratio.

Pasture 3 continuous, in its current condition are capable of producing enough forage to support **308 animal units (AUs)**. The system in its present condition can support an average of **293 cows**, with an average weight of 1000 lbs., and **11 bulls**, with an average weight of 1350 lbs with a suggested 20:1 Cow/Bull ratio.

Pastures 3 rotational, in its current condition are capable of producing enough forage to support **153 animal units (AUs)**. The system in its present condition can support an average of **145 cows**, with an average weight of 1000 lbs., and **6 bulls**, with an average weight of 1350 lbs with a suggested 20:1 Cow/Bull ratio.

The Yucca Pens pastures in their current condition are capable of producing enough forage to support **207 animal units (AUs)**. The system in its present condition can support an average of **197 cows**, with an average weight of 1000 lbs., and **7 bulls**, with an average weight of 1350 lbs with a suggested 20:1 Cow/Bull ratio.

One animal unit (AU) is one mature cow of approximately 1,000 pounds and a calf up to weaning, usually six (6) months of age, or their equivalent. To estimate animal units for Heifers and Bulls use the following AU values.

Table 1: Animal Unit Equivalent Guide

Species	Average Weight (pounds)	Animal Unit Equivalent (AUE)	---- Forage Consumed (pounds) ----		
			Day	month	year
Cow, dry	950	0.92	24	727	8,730
Cow with calf	1,000	1.00	26	790	9,490
Bull, mature	1,500	1.35	35	1,067	12,811
Cattle, 1 year old	600	0.60	15.6	474	5,694
Cattle, 2 year old	800	0.80	20.8	632	7,592
Deer, white-tailed, mature	150	0.15	3.9	118	1,423

4. Objectives:

The objectives of the land managers are to improve or maintain the natural ecological communities on wetland and upland sites through maintenance. Grazing and other activities will minimize impacts to other resources, specifically water quality. The objectives of the prescribed grazing plan are to improve and/or maintain an optimum level of the native forages and assist in the reduction of biomass. The proposed grazing plan considers animal health (domestic and native) by using a stocking rate that will provide the needed forage and browse for the animals while protecting the natural resources of the site. The recommended initial stocking rate is based on a comprehensive forage inventory conducted on the Wildlife Management Area in October of 2011. The proposed grazing plan also considers minerals and other supplements needed by the animals. The type and suggested season for providing the needed supplements will be shown on the grazing schedule. The profitability of the site as a Cow/Calf operation was not taken into account in this plan and will be to the land user to determine.

5. Livestock Forage Inventory:

Livestock Forage Inventories are estimates of available forage in each pasture. These estimates are then used to project stocking rates and feed requirements annually. The following Livestock Forage Inventory was evaluated at the time of the development of this plan in October 2011. Forage availability will vary due to climatic conditions and management of grazing system. The forage inventory should be evaluated on a regular basis to ensure proper forage requirements of the livestock are met.

The main forage is Wiregrass in Native areas. Some of the Rangeland plants are listed in Table 4. These plants are good indicators to help you manage the grazing periods.

Forage Inventory Identified the following conditions/ concerns:

- The project area encompasses approximately **44,000** acres.
- The sustainable annual carrying capacity of the project area is estimated at approximately **1220.6** Animal Units (AU) in the existing conditions. The carrying capacity of the site is expected to change with the implementation of the land management practices such as brush management and prescribed burning. These changes may significantly increase or decrease the amount of forage produced.
- Overall vegetative conditions and plant species indicate that the project area is stocked at or below the sustainable carrying capacity.
- A high number of wildlife utilizes the area including Turkey, White-tailed deer, Wading birds and other species.
- Pastures and Rangeland areas are in good condition and show no signs of being overgrazed.

The Prescribed Grazing Plan contains 10 items which should be implemented annually in order to achieve the desired results.

Grazing Management Specifications:

The following actions will be taken to ensure this grazing system will meet the intended objectives. In the event that one or more of these actions cannot be achieved, the landowner will request assistance from the local NRCS office to make adjustments.

- 1. Rotational Grazing System** – Actions will be to promote a rotational grazing system and obtain uniform distribution of animals across the area in order to maintain and improve the health and vigor of the plant community. The grazing management system will involve the project area along with additional pasture owned or managed by the Lessee. Grazing animals will be moved to a different grazing unit as forage conditions indicate. When it is not possible grazing animals will be relocated to another site, to ensure no negative impacts to plant health.

The livestock manager will maintain records of the rotational grazing system for the life of the lease agreement. The records will include the number of animals in the herd, the date animals are moved into a field, the date animals are moved out of a field, and observations of key forage plants. Table 1 illustrates how the information may be recorded.

Table 1: Example of Grazing Record

Field No.	No. of AU	Date In	Cow BCS ¹	Date Out	Cow BCS ¹	No. Days	Forage Observations and Management Notes
1	30	12/31/04	4	1/20/05	4	21	Cows grazing sloughs and marshes. No rain, Began feeding protein and energy supplement 16%protein at 5 pounds per head per day.
3	30	1/20/05	4	2/10/05	4	21	Moved cows to unit 3, Still feeding supplement. Maidencane holding up well, Rained 2"
4	30	3/1/05	4	5/30/05	4	90	Cows moved to unit 4, Cows grazing burned area. Stopped feeding supplement on April 1,

¹ BCS – Body Condition Score, basically a description of the fatness of a cow. A numerical scale from 1 to 9 is used to describe varying degrees of fatness. Animals with a BCS of 1 are extremely thin and animals with score of 9 are excessively fat. The best range of scores is 5 to 7. For additional information refer to the IFAS publication “*Effect of Body Condition on Rebreeding.*” publication number AS-51.

The maximum length of the grazing periods will be dependent upon the forage type and amount of forage available. The following table shows the recommended length of the grazing period. Also included in the table are specific conditions which must be met in order to extend the grazing period.

Grazing heights for native forage plants is dependent upon the species and the time of year the plant is grazed. For Native Grasses, **remove no more than 50% (by weight) of the plant in any grazing event** This will provide proper use of the forage while maintaining sufficient plant material to, provide wildlife habitat, protect the soil resource, and maintain the health of the plant community.

Grazing periods should be kept relatively short to prevent the plants from being grazed before they have the opportunity to recover from the last grazing event. This will depend on the size of the herd and the area to be grazed. Use the forage heights shown in the previous table to determine the length of the grazing periods.

Table 2: Length of Grazing Periods

Length of Grazing Period		Conditions Necessary to Extend the Grazing Period
Ideal	Maximum Recommended	
7-21Days	35 Days	Average height of Key Native Forages is above the Min. Grazing Height to End Grazing and the Degree of Use has not exceeded the limit for the season. Average height of Bahiagrass is above 2" and/or sufficient hay is being provided to meet animal requirements (15-20 lbs. day).

A rest or recovery period will be provided following grazing events to allow the plants to recover from the effects of grazing. Recovery periods should be long enough to allow the forages to reach the *minimum height to begin grazing* prior to the next grazing event. Because the rest periods are based on the growth rate of the plants, the length of the rest period will vary. The recommended rest periods are shown in Table 3.

Table 3: Rest Periods Based on Forage Growth Rate

Forage Species	Forage Growth Rate		
	<i>Fast</i> (June 1-Sept 1)	<i>Moderate</i> (Mar 1-June 1 and Sept 1 - Nov 1)	<i>Dormant</i> (Nov 1- Mar 1)
Wiregrass	28-35 days	35-45 days	45-60 days or more
Maidencane	28-35 days	35-45 days	45-60 days or more
Chalky bluestem	28-35 days	35-45 days	45-60 days or more

2. **Proper Grazing Use** – The degree of use allowable on rangeland, native pasture, and land used by wildlife will be applied as follows:
 - a. The degree of use is limited to 50 % (by weight) of the current year’s growth of the key forage species when the grazing occurs during the current growing season. The growing season is considered to be the period from March 1 to October 31.
 - b. The degree of use is limited to 65% by weight of the current season’s growth when the grazing is limited to the dormant season. In this situation, utilization should be measured prior to the beginning of the new growing season.
3. **Stubble Height** – Livestock will be managed in a manner that will avoid grazing key forage plants below the recommended stubble height. Cattle will be moved to a new pasture when more than 75 % of the key forage plants have been grazed to or below the recommended stubble height. Refer to Table 4 for the key forage species found in the project area along with recommended heights to maintain healthy stands of forage.

Table 4: Key Forages and Grazing Heights for Key Forages

Forage Species	Plant Community	Minimum Height To Begin Grazing	Minimum Height to End Grazing
----------------	-----------------	---------------------------------	-------------------------------

Limpogress	Pasture	24"	10"
Bahia grass	Pasture	6"	2"
Wiregrass	South Florida Flatwoods	14"	8"
Purple bluestem and/or	Wet Prairie (Slough)	14"	8"
Chalky bluestem	Dry Prairie	14"	8"

4. **Nesting Period** – Cattle will be rotated through the grazing units in a manner that provides a 4 to 6 week ungrazed period during the prime nesting season. This will allow wildlife the opportunity to nest without disruption. The prime nesting season occurs between February 1 and June 30. This deferment from grazing will also prevent stress on native grasses and forbs during the early portion of the growing season when soil moisture is generally limited. During this period the animals will be moved to other pastures owned or managed by the Lessee. If necessary, hay and supplemental feed will be provided when forage is limited.

5. **Deferment Period** - A deferment from grazing will be provided following all land management actions. A grazing deferment requires the complete removal of all livestock for a specified period of time. The minimum deferment periods shall be consistent with the following guidance and the individual conservation practice specifications. Longer deferment periods may be needed if the vigor of the desirable plants is low prior to the treatment or if the vegetation does not recover as quickly as expected. The required deferment for selected practices is:
 - a. Prescribed Burning - The deferment period shall be a minimum of 30 consecutive days during the growing season.
 - b. Brush Management - The deferment period for this practice will be 90 consecutive days during the period of June 1 through October 1, unless only spot treatment was applied.
 - c. Pest Management - The deferment period for this practice shall be in accordance with all herbicide label instructions.

6. **Supplemental Feed** - Supplemental feed will be provided to livestock at the landowner's expense during periods when forage growth and quality is low. Supplemental feeding stations should be located at least 200 feet from ponded water, and should be moved monthly to ensure animals do not create large areas devoid of vegetation. Plant tissue tests should be used to identify nutritional deficiencies. As a general rule the manager will need to provide:
 - a. Protein and energy supplements from October through April. If more than 20 % of the herd has a body condition score below 4, hay and supplemental feed will be provided. This will prevent degradation of wildlife food and cover resources by hungry livestock.
 - b. Minerals should be provided free choice throughout the year.

7. **Weed Prevention** - All Hay, and supplemental feed brought into the project area will be free of weed seed.
 - a. Hay should be obtained from fields that were free of common, noxious, and invasive plants.
 - b. All grains and other supplemental fees used should be certified free of noxious and/or invasive plants.

8. **Feeding Areas** - All hay and supplements will be fed to domestic animals on upland areas that are a minimum of 200 feet away from wetlands, streams, and ditches.

9. **General Maintenance** – All general maintenance of existing structure (i.e. Fence, Watering facilities, etc.) shall be maintained at the landowner’s expense to ensure grazing and animal health is properly maintained.
 - a. Watering Facilities should be maintained and cleaned regularly to ensure water is clean and free of aquatic plants, water should be maintained 2 inches below trough edge to ensure water is contained within trough.
 - b. Fences will be maintained to ensure animals are confined in the approved grazing unit, general maintenance involving repair or replacement of post, line post and wire will be at the landowner’s expense and must be maintained through the life of the lease.

10. **Portable Feeders** - Use portable feeders to provide protein and minerals.
 - a. Move supplement feeders at least once every 90 days or when more than 20 % of the area within a 100 foot radius around the feeder has become denuded.
 - b. Supplement feeders should be moved at least 500 feet from the prior location when practical.

11. **Plan Review** - The livestock owner will schedule annual reviews with the local NRCS office to ensure the plan meets the goals of the WMA.

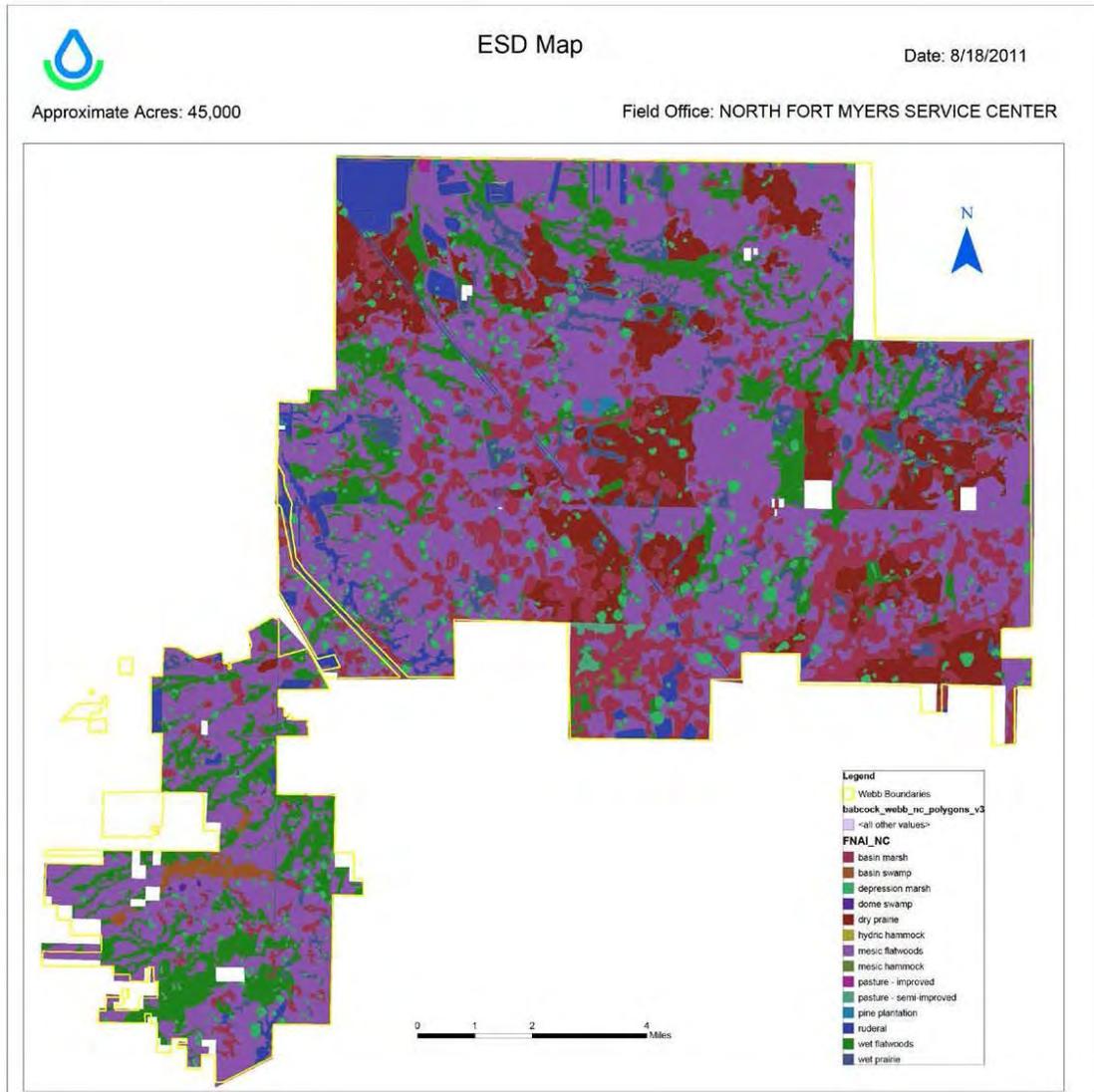
Cooperator: Webb WMA

Technician: Ken L. - Jack C.

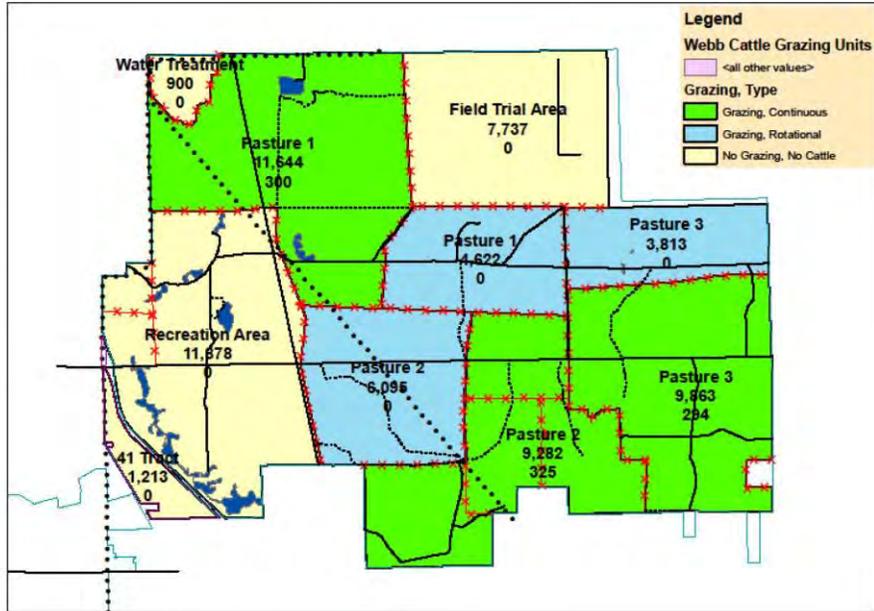
Date: Oct. 2011

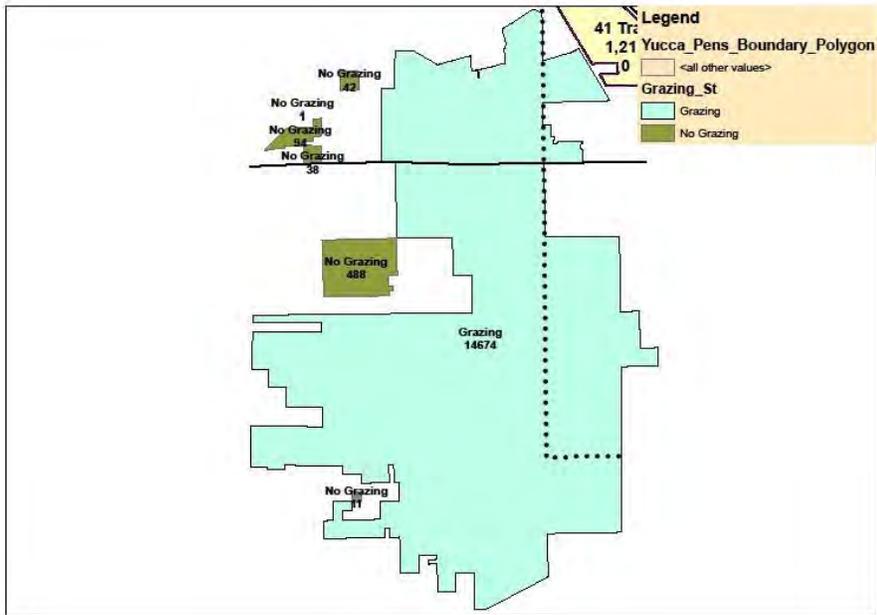
Field Name or Number and Kind of Forage	RANGELAND				PASTURE AND CROPLAND				AVAILABLE FORAGE	
	Ecological Community or Range Site	Condition Class (E, G, F, P)	Acres (Ac.)	Suggested Stocking Rate (Acre/AU)	Growing Period (months)	Fertility Level (lbs.N) (Ac.)	Acres	Suggested Stocking Rate (AUM/Ac.)	Animal Unit Month (AUM)	Animal Unit Year (AU)
Pasture 2, continuous 9282 ac	SFFW	F	9282	30					3712.8	309.4
Pasture 2, rotational 6095 ac	SFFW	F	6095	25					2925.6	243.8
Pasture 2, Total AU's 15377 ac	553.2									
Pasture 3, continuous 9863 ac	SFFW	F	9863	32					3698.6	308.2
Pasture 3, rotational 3813 ac	SFFW	F	3813	25					1830.2	152.5
Pasture 3, Total AU's 13676 ac	460.7									
TOTAL			29053				0		12167.3	1013.9
Forage production will vary between years depending on precipitation and temperatures.										
Notes:										

6. Livestock Forage Inventory Map:



8. Plan Map





9. Recommended Grazing Heights and Length of Grazing Periods:

Grazing animals can rapidly and substantially alter the productivity and amount of forage in each pasture because of grazing preferences and animal distribution. Overgrazing adversely affects wildlife habitat, plant growth, water, soil conservation, and plant persistence. Animals prefer improved pasture forages like the one listed below and avoid plants that are coarse and hard to digest. During the late spring, summer and early fall cattle tend graze upland areas and avoid grazing in wetlands such as sloughs and marshes if adequate forage is available. However, limited availability of forage plants on upland areas may induce more grazing of the wetland plants in some seasons, and could result in overgrazing. Under-grazing results in forage waste, reduced quality, and reduced tiller development. Therefore, the number of animals on a specific area must be balanced with available forage to achieve the goals and objectives for this site. This will require monitoring of the forage availability on a regular basis and adjusting the stock density as needed to maintain a unique balance of desirable forage and important wetland vegetation. See Tables 2, 3, 4.

10. Adjustments to the Grazing System:

Adjustments in the grazing management system will be necessary during and after management activities, such as planting, prescribed burning or pest management. The adjustments will provide a suitable period for the vegetation to recover from the management activity or as dictated by pesticide label restrictions. A deferment from grazing means the complete removal of **all** domestic animals for the duration of the deferment.

If buffer areas are developed around specific wetlands or other areas within the Ranch during the restoration process, livestock grazing may be permitted during dry periods of the year. This will help to utilize available forages within the buffer and control woody vegetation. Stocking rates should be adjusted to assure that grazing is complete within one week. The minimum grazing heights listed in Section 9 for corresponding grasses shall not be exceeded.

When prescribed burning is applied, grazing shall be deferred as follows:

Improved pasture areas	30-60 days during the growing season (Mar1-Oct1)
Flatwoods and Wet/Dry Prairie	30-90 days during the growing season (Mar1-Oct1)
Fresh Water Marsh and Slough	30-90 days during the growing season (Mar1-Oct1)

Areas that have been disturbed and planted to native vegetation shall be deferred from grazing for a minimum of 1 complete growing season following planting or until the grass is well established and produces seed. Native grass plantings generally require 2 complete growing seasons to become well established. The deferment shall continue until a NRCS Rangeland or Grazing Land Specialist has provided approval. Temporary fences may be used to protect small areas during the deferment period.

Areas that have been mechanically treated and/or planted, will be provided a deferment period to allow herbaceous plants to recover. The deferment will be a minimum of 90 consecutive days during the period of March 1 to December 1, unless only spot control was applied.

If herbicides used to control common weeds and invasive species the grazing management will be adjusted to meet the requirements (if any) listed on the herbicide label. Cattle will not be allowed to re-enter the area for the duration shown on the herbicide label.

11. Operation and Maintenance:

The location of mineral and supplement feeders will be moved routinely to evenly distribute grazing animals throughout the pasture. The herd will be rotated to a fresh pasture when the average stubble height falls below the recommended minimum grazing height (See Section 9). When possible, the grazing period should be 14 days or less and the pastures allowed a recovery period of 21 days or until the forage reaches the recommended height to begin grazing (See Section 9).

12. Contingency Management Plan:

Forage supplies will be evaluated weekly to determine if forage supplies and quality are adequate to meet livestock demand. When the forage is not adequate, the grazing system will be adjusted or supplemental feed will be supplied.

13. Record Keeping Plan:

Records of grazing rotations need to be maintained and provided to ensure pastures are adequately grazed through the year. Forage enclosures may help producers establish a baseline of forage amount removed during a grazing season. A grazing sick and recorded grazing height for a pasture on date in and out can also help to insure grazing pastures are not over and/or underutilized.

16 Arthropod Control Plans: Charlotte and Lee counties

* Lee County Arthropod Control Plan pending



CHARLES H. BRONSON
COMMISSIONER

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

Chapters 388.4111, F.S. and 5E-13.042(4)(b), F.A.C.
Telephone: (850) 922-7011

For use in documenting an Arthropod control plan for lands designated by the State of Florida or any political subdivision thereof as being environmentally sensitive and biologically highly productive therein.

Name of Designated Land:
Fred C. Babcock-Cecil M. Webb Wildlife Management Area

Is Control Work Necessary: Yes No

Location:
29200 Tucker Grade, Punta Gorda, FL 33955, Charlotte County

Land Management Agency:
Florida Fish and Wildlife Conservation Commission

Are Arthropod Surveillance Activities Necessary? Yes No

If "Yes", please explain:

Which Surveillance Techniques Are Proposed?
Please Check All That Apply:

- | | | |
|--|--------------------------------------|--|
| <input type="checkbox"/> Landing Rate Counts | <input type="checkbox"/> Light Traps | <input type="checkbox"/> Sentinel Chickens |
| <input type="checkbox"/> Citizen Complaints | <input type="checkbox"/> Larval Dips | <input type="checkbox"/> Other |

If "Other", please explain:
None at this time.

Arthropod Species for Which Control is Proposed:
None

Proposed Larval Control:
None

Proposed larval monitoring procedure:

Are post treatment counts being obtained: Yes No

Biological Control of Larvae: None

Might predacious fish be stocked: Yes No

Other biological controls that might be used:

Material to be Used for Larvaciding Applications:

(Please Check All That Apply.)

- Bti
- Bs
- Methoprene
- Non-Petroleum Surface Film
- Other, please specify:

Please specify the following for each larvacide:

Chemical or Common name:

Ground Aerial

Rate of application:

Method of application:

Proposed Adult Mosquito Control: None

Aerial adulticiding Yes No

Ground adulticiding Yes No

Please specify the following for each adulticide:

Chemical or common name:

Rate of application:

Method of application:

Proposed Modifications for Public Health Emergency Control: Arthropod control agency may request special exception to this plan during a threat to public or animal health declared by State Health Officer or Commissioner of Agriculture.

Proposed Notification Procedure for Control Activities:
None

Records:

Are records being kept in accordance with Chapter 388, F.S.:

Yes No

Records Location:

How long are records maintained:

Vegetation Modification: None

What trimming or altering of vegetation to conduct surveillance or treatment is proposed?
None

Proposed Land Modifications: None

Is any land modification, i.e., rotary ditching, proposed:
No

Include proposed operational schedules for water fluctuations:
NA

List any periodic restrictions, as applicable, for example peak fish spawning times.
NA

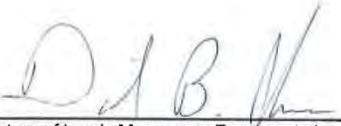
Proposed Modification of Aquatic Vegetation:
None

Land Manager Comments:

No vegetation modifications will be done for arthropod control.

Arthropod Control Agency Comments:

At this time, we do not need to conduct any arthropod control on the Fred C. Babcock-Cecil M. Webb Wildlife Management Area.


Signature of Lands Manager or Representative 12/11/14
Date


Signature of Mosquito Control Director / Manager 12/3/14
Date

DACS-13668 07/08

17 Letters of Compliance: Charlotte County and Lee County Comprehensive Plans



Charlotte County Government

"To exceed expectations in the delivery of public services."

www.CharlotteCountyFL.gov

January 9, 2015

Jennifer Tucker
Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Land Conservation and Planning
620 South Meridian Street
Tallahassee, FL 32399

Subject: Fred C. Babcock – Cecil M. Webb Wildlife Management Area Management Plan 2014-2024

Dear Ms. Tucker:

Thank you for granting the County the opportunity to review the Management Plan for the Babcock-Webb WMA. After review, we find that the Management Plan is consistent with Charlotte 2050, the Charlotte County comprehensive plan.

If you have any questions about or comments on this letter, please feel free to contact me at 941.764.4934.

Sincerely,

Matthew T. Trepal
Principal Planner

COMMUNITY DEVELOPMENT

Inspections | Code Compliance | CEB
Permitting | Licensing | CILB
Plans Review | Right of Way & Stormwater
Comprehensive Planning | Zoning
18400 Murdock Circle | Port Charlotte, FL 33948-1074
Phone: 941.743.1201 | Fax: 941.764.4907



John E. Manning
District One

Cecil L. Pendergrass
District Two

Larry Kiker
District Three

Brian Hamman
District Four

Frank Mann
District Five

Roger Desjarlais
County Manager

Richard Wm. Wesch
County Attorney

Donna Marie Collins
Hearing Examiner

January 20, 2015

Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Land Conservation and Planning
Farris Bryant Building
620 South Meridian St.
Tallahassee, FL 32399-1600

Attn: Jennifer Tucker

Re: Babcock-Webb WMA Management Plan
Compliance with Lee County Comprehensive Plan

Dear Ms. Tucker:

Lee County Planning and Environmental Sciences staffs have reviewed the proposed Babcock-Webb WMA Management Plan for compliance with the Lee County Comprehensive Plan, the Lee Plan. Most of that portion of the Wildlife Management Area located in Lee County has been designated Conservation Upland and Conservation Wetland by the Lee Plan.

Staff finds that the proposed Management Plan is consistent with and furthers the Goals, Objectives and Policies of the Lee Plan.

Please feel free to contact me at 239-533-8309 or oconnops@leegov.com if you have any questions.

Sincerely,

DEPARTMENT OF COMMUNITY DEVELOPMENT
LEE COUNTY, FLORIDA
Division of Planning

A handwritten signature in blue ink that reads "Paul O'Connor".

Paul O'Connor, AICP, Director

P.O. Box 398, Fort Myers, Florida 33902-0398 (239) 533-2111
Internet address <http://www.lee-county.com>
AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER