

***Three Forks Conservation Area  
Brevard County, Florida  
Grazing Management Plan***



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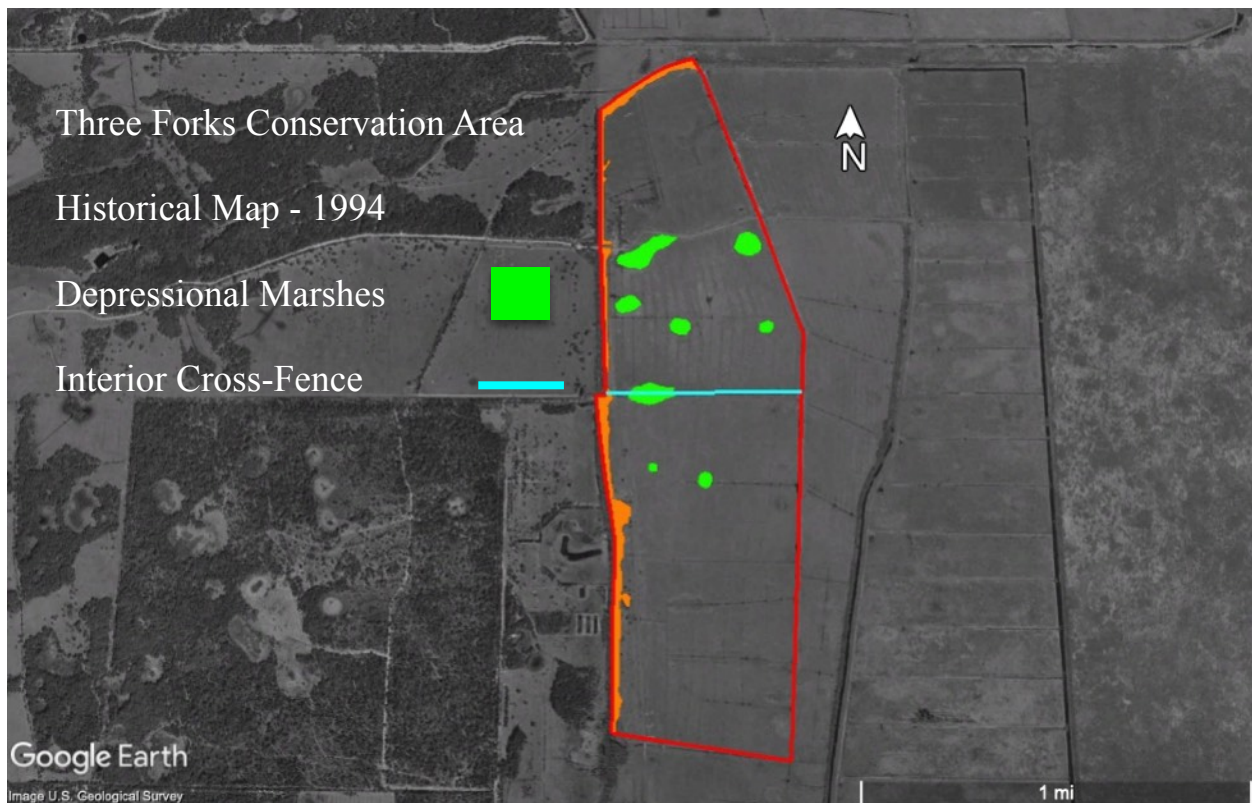
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## General Property Description

The Three Forks Conservation Area is located along the western floodplain of the upper reach of the St. Johns River. This grazing lease consists of 561 acres of formerly improved pasturelands. Historically extensive field ditches were installed to drain the hydric soils to allow for domesticated forages such as bahiagrass (*Paspalum notatum*) and hemarthria (*Hemarthria altissima*) to thrive. For more information on the soils present on this property refer to Appendix I.

In an effort to improve the water quality entering the St. John River, the ability of the land to drain to a level observed in the 1994 aerial photo shown below has been curtailed. As a result of current land management objectives and resulting hydric conditions, the eastern side of the property appears to be too wet to sustain bahiagrass pasture. However, hemarthria along with desirable native forages such as blue maidencane, maidencane, cutgrass and purple bluestem are capable of producing significant forage under these conditions.

On the Conservation Plan Map, located on page 6 of this plan, describes the property into four major land cover - land use types referred to as Improved Pasture, Semi-Improved Pasture, Marsh and Mesic Hardwood Forests. See Appendix II for a more detailed information on the characteristics of these grazing land areas.



Areas identified as Improved Pasture on Three Forks Conservation Area is shown in the photo to the right having an excellent stand of bahiagrass forage present. On a vegetative transect collected on the property at a similar site yielded 82% of the area dominated by bahiagrass, with balance consisting of 10% soft rush, 4% sedges, 2% carpetgrass and 2% annual forbs species.



Looking southward on the Three Forks Conservation Area, this photo demonstrates a contrasting line that can be observed between the Improved Pasture on the right (west side of property) and the Semi Improved Pasture's weedy landscape on the left (east side of property). In the semi improved areas, bahiagrass is less prevalent with more dogfennel, sea myrtle and hemarthria grass dominating.



In areas of the Semi Improved Pasture that transitions into Marshes, tall areas of sea myrtles becomes the dominant shrub. Prescribed burning and roller chopping would be beneficial to the wildlife habitat and improve the carrying capacity for livestock in these areas.

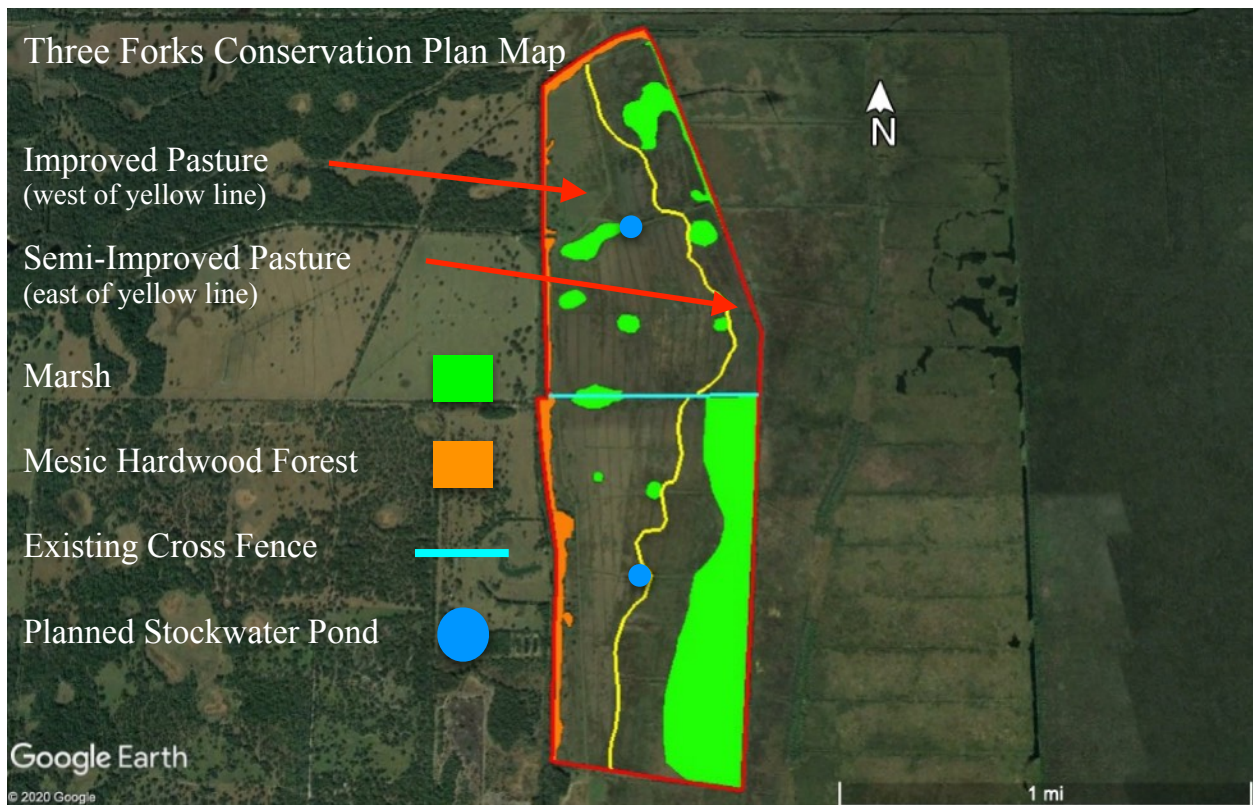


## Goals & Objectives

The objective of this grazing management plan is to provide guidance and recommendations to SJRWMD land management staff and the grazing lessee on methods and techniques that will support livestock grazing as an effective land management tool on the There Forks Conservation Area. This grazing management plan will focus on methods, tools, and techniques that will provide a low-density livestock enterprise while supporting SJRWMD land management goals for the property.

Use of recognized grazing management principles will encourage livestock grazing as a low cost and functional land management tool. The judicious use of supporting practices such as cross-fencing, stockwater development, prescribed burning and brush/weed management will be considered where applicable.

The objective of this grazing management plan will be to recommend the appropriate use of existing forage resources in a manner that will meet livestock daily requirements. The ability to apply livestock grazing for the benefit of natural resource management requires having the right stock density, controlling the length of grazing duration and allowing for enough time between grazing events for recovery of key forage plants. By periodically moving portable livestock supplemental feeding stations, e.g., mineral feeders, will encourage better livestock distribution and promote effective grazing land management.



**To achieve land management goals & objectives the following must be accomplished:**

1. Maintain “cow-tight” boundary fences.
2. Ensure quality stockwater is available at all times.
3. Control shrubs and herbaceous weeds where needed.
4. Enhance grazing management by cross-fencing and/or movement of supplements.
5. Maintain grazing records to assist with annual grazing plan revisions.
6. Revise the annual grazing management plan in a timely manner incorporating SRJWMD management and lessee inputs.

**Soils**

Review of the county-level published soil survey for the Three Forks Conservation Area is an important part of inventorying the natural resources and for making forage production predictions. The USDA - NRCS Soil Survey recognizes 6 different soil map units within this 561 acre parcel. Soils provide valuable information pertaining to present and former natural ecological communities, their ability to growth native and domestic forages, and to manage for better wildlife habitat.

In **Appendix I** of this management plan is a list of soils found on the property and their soil map symbols, soil names and native plant communities correlated to each soil. Native plant communities are divided into frequent fire/fire dependent, infrequent fire/fire sub-climax and those that experience rare or no fire/climax communities. Following this table of information is a soil map of the property.

**Grazing Management & Supporting Practices**

USDA - NRCS conservation practice Prescribed Grazing - Code 528, is the application of managing the harvesting of vegetation with grazing and/or browsing animals. This practice combined with Prescribed Burning - Code 338, Firebreak - Code 394, Brush Management - Code 314, Herbaceous Weed Control - Code 315, Fence - Code 382, Integrated Pest Management - Code 595 and Watering Facility - Code 614 should be incorporated within this grazing management plan to ensure healthy livestock, sustainable forage resources and desirable wildlife habitats.

**Fencing**

Interior cross-fencing provides the ideal method of controlling livestock grazing and allows the ranchers to graze and defer grazing as needed. Due to Florida’s poor soil nutritional qualities, a complete mineral supplement should be provided for livestock throughout the year. In lieu of crossing fencing to control livestock access, movement of mineral feeders every 1 - 2 weeks will improve livestock grazing distribution and assist the rancher in applying better grazing management. See **Appendix V** of this management plan for USDA - NRCS constructions specifications for barbwire fencing.

## **Stockwater Development**

Beef cattle consume 12 - 15 gallons of water daily for optimum performance. Having stockwater located in such a manner that will aid in livestock distribution will result in less stress on the cattle, less trailing and trampling of forages and promote better forage utilization.

Livestock water is commonly provided in two ways, 1) excavated stockwater ponds or 2) installed troughs and well using a submersible solar pump. Stockwater ponds when large enough can provide suitable livestock water. The minimum size of each stockwater pond should be 1/4 acre in size, 10 foot maximum depth, having one end of the pond's sides sloped at 4:1 for cattle access, and having the remaining three sides sloped at 2:1. Using these dimensions, approximately 2,433 cubic yards of material will be required to be excavated to create a 1/4 acre stockwater pond.

Surface water available from existing perimeter and field ditches could offset the need for installing stockwater ponds or other sources of water. If these are to be considered, adequate access points need to be created for the livestock and assurances that these sources will retain water during extended dry periods is essential.

The most desirable stockwater is generated from a well and trough system. This ensures the best quality water available to livestock and minimizes livestock diseases and other pathogens. Larger troughs provide good storage and adequate linear head-space for cattle to have access to good quality water when needed. See **Appendix VI** in this management plan for more information on stockwater development alternatives.

## **Brush Management**

The dominant woody plant requiring brush management on this property is sea myrtle (*Baccharis spp.*) which can reach 12 feet in height or greater. Areas where sea myrtle has encroached into wetlands should be managed with prescribed burning in an effort to diminish woody biomass. Sea myrtle encroachment into semi improved pasture areas could be controlled by roller-chopping. Defer grazing a minimum of 30 days during the active grazing season following chopping and burning to allow for forage recovery.

## **Herbaceous Weeds**

Herbaceous weeds observed within the Three Forks Conservation Area included, dogfennel, ragweed, West Indian marshgrass and tropical soda apple. Dog fennel and ragweed are common pasture weeds that need to be mowed prior to seed set if at all possible. Good grazing management will stimulate desirable forage species to compete effectively with these common weeds once they have been mowed.

Category I invasive species observed on the property include West Indian marshgrass and tropical soda apple. West Indian marshgrass (*Hymenachne amplexicaulis*) is native to central and south America and produces vast amounts of biomass and seed in wetland areas.



Fortunately, West Indian marshgrass is readily consumed by cattle as a forage source, thus cattle grazing will greatly assist in controlling this species.

Tropical soda apple (*Solanum viarum*) commonly referred to as TSA, is native to South America and is a highly aggressive invasive species that needs to be controlled immediately upon discovery. This thorny leaved plant produces round fruit containing up to 400 seeds each that are readily consumed by hogs, deer and cattle. Seeds that pass through the animal are deposited within a fertile medium that accelerates their spread of this species throughout the pasture and under the shade of hammocks. University of Florida recommends spot spraying the entire plant with Milestone at .5 - .8 oz per 2.5 gallons plus a .25% non-ionic surfactant and use of a color marker to avoid double spraying the same plant twice. GrazonNext HL (triclopyr) is also recommended at .5 - 1% solution with .25 % non-ionic surfactant and a color marker when spot-spraying TSA.



**Prescribed Burning**

Prescribed burning is often used to reduce biomass accumulation, retard woody brush encroachment, minimize wildfire threats and to mimic natural ecological functions that fire provides to Florida’s fire-dependent ecological communities such as freshwater marshes found on the grazing lease. Other than to assist with woody shrub control as discussed under brush management, prescribed burning is typically not recommended on Improved Pasture and should be restricted to fire dependent natural areas and the Semi Improved Pasture area when woody shrubs control is needed.

**Grazing Height Tolerances**

To sustain and optimize forage species production, grazing utilization needs to be maintained within proper stubble heights or grazing tolerances of the species consumed. Following these guidelines will ensure rapid recovery and regrowth of forages following grazing periods, improved forage quality and sustain forage productivity.

<b><i>Forage Species</i></b>	<b><i>Begin Grazing</i></b>	<b><i>Begin Resting</i></b>
Bahiagrass	6 - 8 inches	2 - 3 inches
Hemarthria	18 - 24 inches	10 - 12 inches
Bluestems	12 - 14 inches	6 - 8 inches
Maidencane	24 - 26 inches	10 - 12 inches
Blue Maidencane	10 - 12 inches	4 - 6 inches

### Animal Unit Equivalents (AUE's)

Animal Unit Equivalents are used to develop a unit of measure across multiple classes of livestock based upon the animal's body weight. AUEs assists in preparing livestock forage inventories and estimates of livestock carrying capacity based upon the ability of each pasture to produce forage. Animal unit day (AUD), animal unit month (AUM) and animal unit year (AUY) estimates the amount of forage available to sustain a 1000 pound cow with calf-at-side for 1, 30 and 365 days respectively.

Livestock Class	Average Weight (pounds)	Animal Unit Equivalent	Forage Consumed *		
			AUD	(Pounds) AUM	AUY **
<b>Cow w/ calf</b>	<b>1000</b>	<b>1.0</b>	<b>26</b>	<b>790</b>	<b>9490</b>
<b>Dry Cow</b>	<b>900</b>	<b>0.9</b>	<b>24</b>	<b>730</b>	<b>8760</b>
<b>Bull</b>	<b>1500</b>	<b>1.5</b>	<b>39</b>	<b>1187</b>	<b>14,235</b>

\* Forage consumed based upon daily intake of 2.6% of livestock body weight.

\*\* AUY assumes calf-at-side is restricted to 6 months

### Livestock Forage Inventory

The livestock forage inventory estimates the current livestock carrying capacity for the Three Forks Conservation Area. In the following table the grazing lease area is described by the forage yield potential from the Improved and Semi Improved Pasture and Marsh areas. In columns 3, 4 and 5 are carrying capacity estimates in acres per animal unit (Ac./AU), animal unit months (AUMs) and total animal units (AU's), or the total number of livestock estimated that can be supported on the property over a 12 month period.

Three Forks Grazing Areas	Acres	Ac/AU	AUMs	Total AUs
<b>North Pasture</b>				
<b>Improved</b>	<b>165.2</b>	<b>6</b>	<b>336</b>	<b>28</b>
<b>Semi- Improved</b>	<b>64.9</b>	<b>9</b>	<b>84</b>	<b>7</b>
<b>Marsh</b>	<b>26.2</b>	<b>12</b>	<b>24</b>	<b>2</b>
<b>South Pasture</b>				
<b>Improved</b>	<b>119.2</b>	<b>6</b>	<b>240</b>	<b>20</b>
<b>Semi-Improved</b>	<b>72.7</b>	<b>9</b>	<b>96</b>	<b>8</b>
<b>Marsh</b>	<b>91.0</b>	<b>12</b>	<b>96</b>	<b>8</b>
<b>Total Grazing Area</b>	<b>539.2</b>		<b>876</b>	<b>73</b>

## Annual Grazing Plan

Livestock forages, both native and introduced provide the essential resources critical to the health and productivity of livestock. The interaction of the cattle upon the landscape, i.e., grazing, trampling, trampling, controlling of invasive plant species and cycling of nutrients contribute greatly to the health and ecological functions of the property. The goal of this annual grazing plan is to improve the forage resource base while benefiting wildlife habitat values.

The following grazing schedule provides a guide to the lessee to manage livestock within the estimated carrying capacity and to provide strategic rest-periods or deferments to ensure adequate recovery of desirable forage species. To assist the rancher to meet land management goals and objectives, adjustments to the livestock forage inventory and this grazing management plan should be done annually based upon forage utilization monitoring and grazing records kept by the lessee. See **Appendix III** in this management plan for more information on creating grazing management records and use of the USDA-NRCS form developed for collecting this information.

## Annual Grazing Schedule

Pasture	AUM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
North Pasture	444												
South Pasture	432												
Livestock Supplements	X - Protein Y - Mineral H - Hay	X Y H	X Y H	X Y H	X Y H	Y	Y	Y	Y	Y	Y	Y	Y

Grazing Periods - Green Blocks

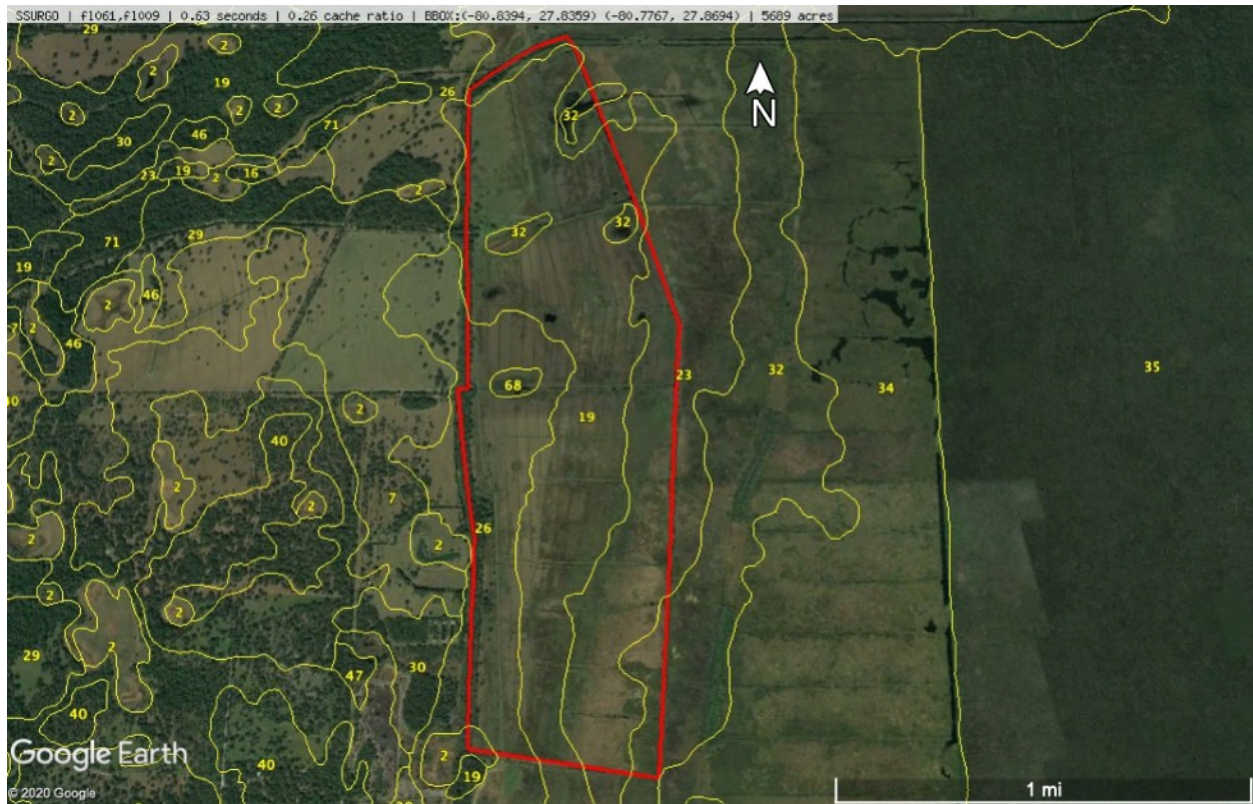
Resting Periods - White Blocks

This grazing schedule is provided as a guide to meet livestock forage requirements, while optimizing forage yields. Bahiagrass on the average will generate a full growth cycle within ~ 30 days following grazing or mowing during the active growing months from May until the onset of cooler nights and shorter days. Once bahiagrass produces seedhead, its productivity and forage quality diminishes rapidly. Therefore, during the active growing months of the year it is advantageous to graze the forage to its grazing tolerance height and defer grazing for ~ 30 days before re-grazing the pasture.

Consequences of weather, markets and other unexpected factors may cause the lessee to deviate from the grazing schedule for short periods of time. However, the overall concept of applied grazing management by providing key deferment periods to promote desirable grassland health and vigor should always be part of the overall management philosophy.

## Appendix I: Soils

Soil Map Symbol	Soil Map Name	Fire Dependent (Frequent Fire)	Fire Sub-Climax (Infrequent Fire)	Climax (Rare or No Fire)
2	Anclote Sand (frequently ponded)	Marsh	Cypress Swamp	Swamp Forest
19	Riviera Sand	Wet Prairie	Mixed Pine/Hydric Forest	Hydric Forest
23	Floridana Sand	Wet Prairie	Mixed Pine/Hydric Forest	Hydric Forest
26	Holopaw Sand	Wet Prairie	Mixed Pine/Hydric Forest	Hydric Forest
32	Mico Mucky Peat (drained)	Marsh	Cypress Swamp	Swamp Forest
68	Tomoka Muck, (drained & frequently ponded)	Marsh	Cypress Swamp	Swamp Forest



## **Appendix II: Grazing Land Resources & Natural Ecological Communities**

**Improved Pasture** - These areas are dominated by domesticated forage species that have been introduced from the Mediterranean such as in hemarthria or South America as in bahiagrass. Due to the fact that these introduced species have not evolved with the naturally low nutrient conditions and acidic soils of Florida, soil amendments such as fertilizer and buffering of the soil to elevate its low pH to acceptable levels is required to create desired growing conditions. On hydric soils such as those common to Florida, forage such as bahiagrass require drainage to encourage its production. When soil amendments are eliminated and/or soil moisture conditions not controlled to desirable levels, domesticated forages are stressed and replaced with native or exotic weeds better able to tolerate growing conditions, e.g., dog fennel.

**Semi-Improved Pasture** - These areas were formally converted from natural/native landscapes or from farm fields to improved pasture that have lost the dominance of its planted forage species either due to lack soil nutrients, desired soil moisture conditions, or poor grazing management, or all of the above. When the desired formerly planted forage species (e.g., bahiagrass or hemarthria) is reduced to less than 50% of the total plant composition we characterize the pasture as Semi Improved. It still has the introduced forage plant present as part of the forage resource, but native or other exotic species have taken over the plant community. When this happens the livestock producer has two choices, either clear the area and replant the desired forage species, or lessen the expected stocking rate and graze within the limitations of the pasture. With the recruitment of desirable native forages such as maidencane, blue maidencane and bluestems, this can be the most ecologically feasible solution on areas dominated by hydric soils.

**Marshes** - These native ecosystems are found in isolated depressions throughout the conservation area and in larger expanses along the eastern boundary of the property. These areas under natural conditions are dominated by maidencane and cutgrass, which are considered desirable native forage resources along with other desirable wetland species. These seasonal wetlands provide multiple benefits to the landscape such as nutrient sinks, ideal habitat for wading birds and variety of other wildlife, and native grazing resources for cattle.

### Appendix III: Grazing Records

It is recommended that the lessee use the USDA-NRCS FL-ECS-3 form for keeping grazing records. Animal Unit Day information can be analyzed to determine if modifications are needed to make adjustment to the annual grazing plan.

U.S. Department of Agriculture  
Natural Resources Conservation Service

FL-ECS-3  
9/2000

#### RANGELAND AND PASTURELAND STOCKING ASSESSMENT RECORDS

PASTURE NO. : \_\_\_\_\_ ACRES: \_\_\_\_\_ YEAR: \_\_\_\_\_

1. Date In: _____ Date Out: _____ Animal Units: _____ Animal Unit Days _____	8. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____
2. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____	9. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____
3. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____	10. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____
4. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____	11. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____
5. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____	12. _____ Date Out _____ Animal Units _____ Animal Unit Days _____
6. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____	13. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____
7. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____	14. Date In _____ Date Out _____ Animal Units _____ Animal Unit Days _____

Animal Unit Days (AUD) = No. Days x Animal Units

TOTAL AUD(s): \_\_\_\_\_

Animal Units Month(s) (AUM) =  $\frac{\text{AUD(s)}}{30(\text{days})}$

TOTAL AUM(s) \_\_\_\_\_

AUM(s) per Acre =  $\frac{\text{Total AUM(s)}}{\text{No. Acres}}$

AUM(s) per Acre \_\_\_\_\_

Dates and Amounts of Fertilizer: \_\_\_\_\_

Date of: First Frost: \_\_\_\_\_ Last Frost \_\_\_\_\_

Monthly Rainfall: J : \_\_\_\_\_ F \_\_\_\_\_ M \_\_\_\_\_ A \_\_\_\_\_ M \_\_\_\_\_ J \_\_\_\_\_ J \_\_\_\_\_ A \_\_\_\_\_ S \_\_\_\_\_ O \_\_\_\_\_ N \_\_\_\_\_ D \_\_\_\_\_

Yearly Rainfall Total \_\_\_\_\_

## Appendix IV: Monitoring Plan

**Vegetative Transects - Plant Composition:** A T-Post is placed in the ground to establish a permanent reference point. From the T-Post a line intercept transect is established for 50 - 100 meters depending on the site location. At 1 - 2 meter intervals, the nearest rooted plant is tallied to assess the plant composition of the pasture. Monitoring the plant composition is important all types of pastures and rangelands and helps determine the trend of desirable species, are they increasing or decreasing over time. Ideal times to collect this information is at the end of the growing season.

**Grazing Utilization:** Grazing exclosure cages provide an opportunity to evaluate the forage utilization levels by the livestock. Once cattle have entered the tract, periodically monitoring grazing exclosure cages during the grazing season will assist in recognizing areas that are being over-grazed and under utilized. Moving mineral feeders or other supplements to areas under utilized will improve animal performance and the overall carrying capacity of the grazing lease.

Cages need to be placed over good examples of desirable forage species. During the evaluation process, compare forage species within the exclosure cage to grazed forage of the same species outside the cage. The percent difference of the plant height or weight of the vegetation outside the cage compared to forage inside the cage provides an estimate of the forage utilization by the livestock.

The rule-thumb for proper grazing utilization is to never graze more than 50% of the available forage by weight. This ensures enough leaf-area remains following grazing to support rapid regrowth of forage and to maintain a strong plant vigor of desirable forage plants.

Below is a grazing exclosure cage design that has worked well in Florida to determine forage utilization rates on grazed pasture and rangelands.



## Appendix V: Barbwire Fence Guidance

**This information should be used as guidance or for reference purposes, unless USDA-NRCS cost-sharing is a consideration. Please refer to SJRWMD performance measures and construction specifications for all practices under consideration.**

This sheet lists the minimum requirements to meet Florida Fence Standard (FL 382) for barbwire fence *if USDA Food Security Act costing-sharing is a consideration*. Variances in fence design may be allowed if requested. All variances requests shall be submitted to the State Rangeland Management Specialist or an individual with proper job approval authority for approval. All barbed wire fences will be installed using braces that meet Florida NRCS specifications for braces. Please note, SJRWMD may have standards that exceed the following.

### Wire and Spacing

Use only new wire composed of two twisted strands of minimum class 3 galvanized 15.5 gauge high tensile steel barbwire.

### Number of Wires

Interior cross fence - 3 wires (minimum) to manage movement of larger livestock such as cattle and horses.

Boundary fence - 4 wire (minimum) are required for boundary fences and next to highways.

### Fence and Wire Height and Placement

Cattle and Horses-

- The minimum top wire height for 4 and 5 wire fences is 42 inches above ground level.
- The minimum top wire height for 3 wire fences is 38 inches above ground level.
- Install wires with a minimum of 10-12 inches spacing between the top 2 wires.

Note: Inline fence wire spacing shown below are recommendations only.

WIRE HEIGHT AND SPACING OF WIRES IN INCHES (“)			
Number of Line Wires	5 Strand	4 Strand	3 Strand
Boundary Fence Top Wire Height (minimum)	46	46	<b>Not Acceptable</b>
Boundary Fence Bottom Wire Height (minimum)	6	12	<b>Not Acceptable</b>
Recommended Inline Fence Wire Spacing (inches)			
Cattle and Horses	6, 16, 26, 36, 46	16, 26, 32, 44	16, 26, 38
To Allow For Wildlife Movement	<b>Not recommended</b>	18, 24, 30, 42	18, 26, 38



## LINE POSTS MATERIALS, POST SPACING AND INSTALIATION DEPTH

- **Steel** - Use only new, painted or galvanized T or U posts.
- **Wood**- Treated with 0.4 lbs/ft<sup>3</sup> of chromate copper arsenate (CCA type A, B or C or equivalent). Minimum size, 3" top-diameter X 6.5' length.
- **Post Spacing** - The maximum distance between line posts is 16 feet without the use of stays, or 30 ft. with a minimum of 1 stay between posts.
- **Installation** - Drive or bury wood posts at least 24 inches into the ground in sandy or loamy soils. Install posts to a 42 inch depth in muck soils. If post holes are dug, backfill by tamping the soil around the post at every 4 in. depth.
- **Fastening** - Attach wires to the side of the post receiving the most livestock pressure. Drive staple diagonally to the wood's grain and at a slight downward angle (upward if the pull is up) such as in low places to avoid splitting posts and loosening of staples. Space should be left between staple and post to permit free movement of wire.
- **Wood posts** - Use 1.5 inch (minimum), 9 gauge (minimum), class 3 galvanized staples.
- **Steel posts** - Use manufactured clips or wire posts.

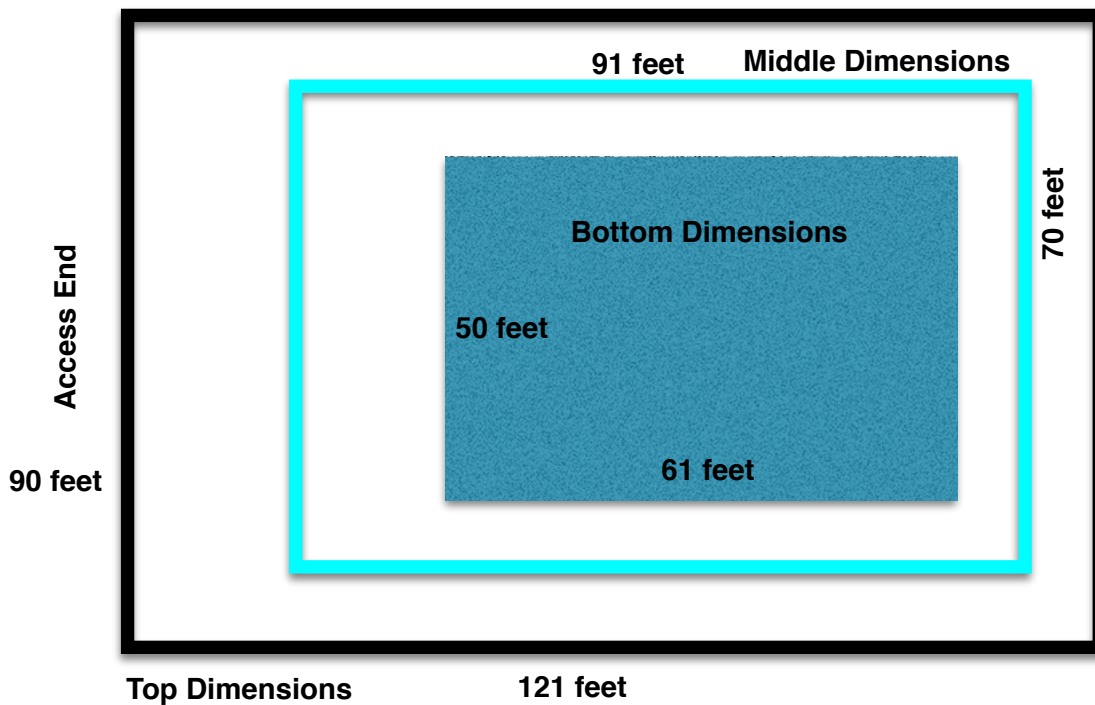
## Appendix VI - Stockwater Development Alternatives

### Stock Pond Design (1/4 Acre)

Access end sloped 4:1

Other sides sloped 2:1

Total volume excavated: 2,433 yds<sup>3</sup>



### Solar Stockwater Systems

Solar stockwater systems with large troughs positioned on a level, solid foundation provides the best quality water for livestock. Solar submersible pumps are cost-effective and can deliver water from shallow wells.

Automatic shutoff valves maintain desired water levels in the trough while keeping water readily available for the animals. Having an overflow outlet directing water away from the trough and its foundation is important to minimize washouts around the trough and its base.

