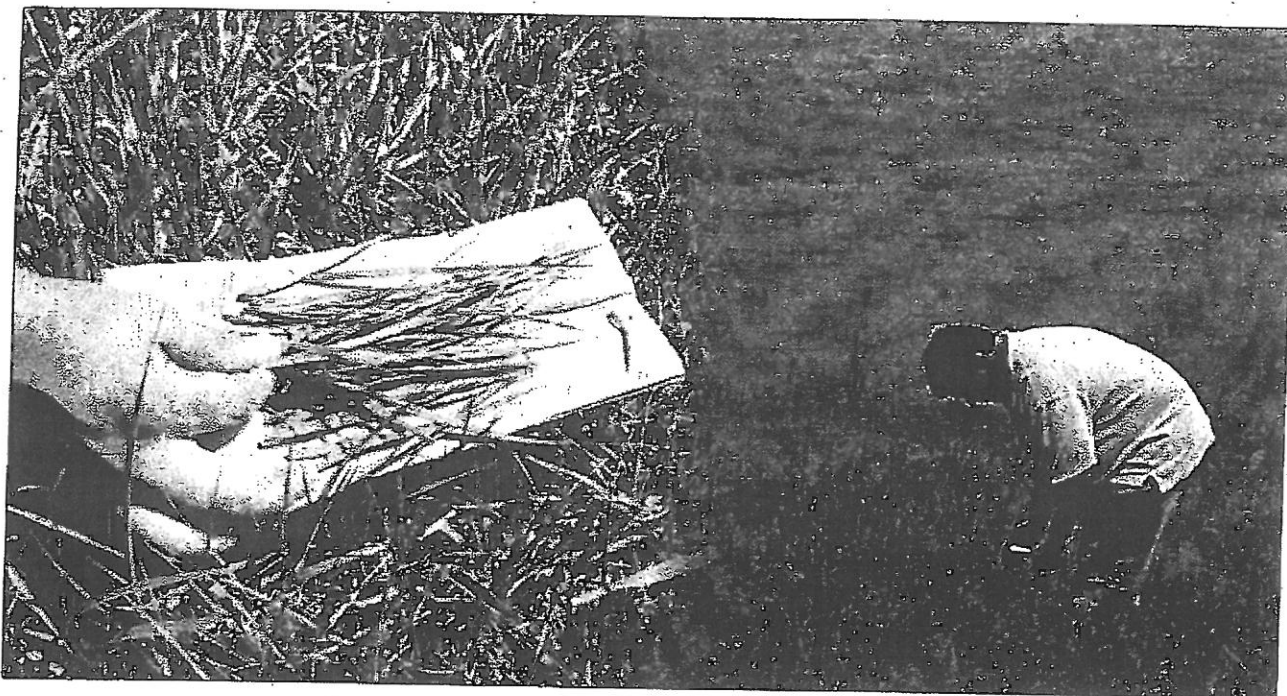


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1.0 NUTRIENT MANAGEMENT

Nutrient management for livestock operations requires a systematic management approach that includes several different, yet related, practices. It is arguably the most important category of BMPs in this manual. It includes managing plant nutrients for optimum forage yields and managing feeding practices to deliver proper nutrition for the animal. It also includes proper animal waste management to protect waterbodies. Nutrient management considers the amount, source, form, placement, and timing of fertilizer application materials. All potential sources of plant nutrients, such as organic and synthetic fertilizer inputs, as well as nutrient reserves within the soil, are identified, inventoried, and addressed.

One of the first steps in developing a sound fertilization management program involves a basic knowledge of soils. Many of Florida's soils naturally contain the required amount of phosphorus, assuming the pH levels are within the range to make this nutrient available. As such, soil testing and analysis is considered to be a cornerstone of any nutrient management program. For most ranches, soil testing should be conducted at a minimum of once every three to five years, or whenever phosphorous fertilizer is used. Nitrogen, which is not analyzed as part of a routine soil test, is a critically important macronutrient for vegetative growth. Plant tissue testing, which can detect plant nitrogen levels, can

be used in conjunction with soil testing to diagnose the overall effectiveness of a fertilization program. Tissue testing is especially useful to help a grower fine-tune their fertilizer application program.

Proper animal nutrition and feedstock management for environmental protection must consider the type, blend, and amount of feed to obtain maximum nutrition and animal health. Moreover, supplemental feed, its content and proximity to a waterbody, must also be considered, as it can secondarily affect nonpoint source pollution. In addition, animal waste management is a final consideration in developing an overall nutrient management budget. The principle goal of this BMP is to minimize nutrient loss to the environment because the offsite transport of nutrients to surface waters from various sources has caused most of the water quality impairment issues in Florida's watersheds.

Working Definition:

Nutrient management consists of fertilizer management, animal nutrition, feedstock management, and animal waste management.

1.1 Fertilizer Management

- ✓ 1. Use a soil test from a lab using the Mehlich-1 or another method approved by the UF-IFAS Extension Soils Testing Laboratory to deter-

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mine P fertilization rate. Analyze the need for tissue testing based on the soil test results.

- ✓ 2. If planting legumes or fertilizing with manure or wastewater residuals, use the Nutrient Budget Worksheet in Appendix 5 to determine whether supplemental fertilizer is needed.
- ✓ 3. Follow UF-IFAS-recommended rates in SL-129 for the particular forage. The criteria to determine phosphorus application on established bahiagrass pastures are: a tissue analysis < 0.15 percent phosphorus, soil pH \geq 5.5, and soil analysis is *very low (less than 10 ppm)* or *low (10 to 15 ppm)* for phosphorus. If using organic materials or manure, adjust the rate of supplemental fertilizer materials based on the product's nutrient content analysis.
- ✓ 4. Time fertilizer applications with plant growth to maximize nutrient uptake and to minimize leaching and runoff.
- ✓ 5. Prevent spreading fertilizer material in streams, sinkholes, or wetlands by maintaining at least a 50 foot setback from these features.
- Maintain records of fertilizer application. Records should include soil test analysis, date of application, fertilizer formulation, application rate, location and acreage, and worksheet results.

1.2 Residuals or Biosolids Application

- ✓ 1. Abide by all applicable regulations in FDEP Rule 62-640, F.A.C., for residuals application, and/or Florida Department of Health (FDOH) Rule 64E-6, F.A.C., for septage application.
- ✓ 2. Request the calcium carbonate equivalency and nutrient analysis of the product, expressed as a dry weight, for residuals or septage treated by lime stabilization. Use this analysis to determine what amount to apply without adversely affecting soil pH. This is especially important when applying the product to bahia grass, since it is an "acid loving" plant.
- ✓ 3. Obtain a copy of the FDEP Agricultural Use Plan from the hauler/applicator when applying residuals or septage, and abide by all grazing restriction and setback requirements.

1.3 Animal Nutrition and Feedstock

- ✓ 1. If using a high amount of supplemental feed, manage your operation so that nutrients in

feed will not lead to high rates of nutrient loads from waste. Keep in mind that livestock generally excrete 60 to 85% of the phosphorus fed to them.

- ✓ 2. Locate any confined feeding areas away from watercourses, wetlands, sinkholes or excessively sloped terrain. Ensure that filter strips or other conservation buffers are maintained between feeding areas and adjacent features.
- ✓ 3. Locate supplemental feeding and mineral stations at least 100 feet away from watercourses, streams, wetlands, wells or sinkholes.

1.4 Animal Waste Management

- ✓ 1. Manage livestock distribution to reduce any concentrated accumulation of wastes that could lead to nutrients contaminating ground water or surface waters.
- ✓ 2. Use onsite concentrated manure sources, if available, as a fertilizer supplement in accordance with soil test results. This will recycle nutrients and reduce the need for inorganic fertilizers.

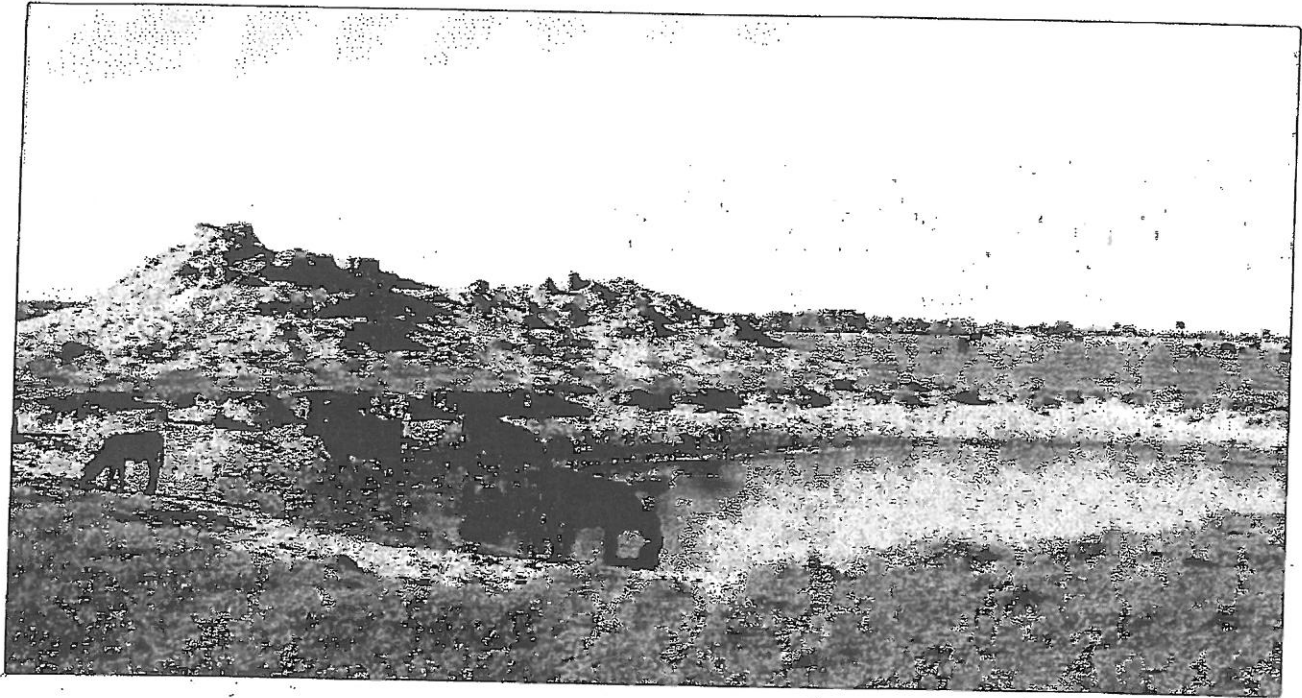
Operation and Maintenance:

- Maintain and calibrate fertilizer application equipment properly.
- Do not mix or load fertilizers near environmentally sensitive areas.
- Store fertilizers properly and in a safe location.

References:

- (1) USDA-NRCS Nutrient Management, Code 590, FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg/>
- (2) Beef Cattle Production Best Management Practices, LSU Ag Center, http://www.lsuagcenter.com/en/crops_livestock/livestock/beef_cattle/production_management/Beef+Cattle+Production+Best+Management+Practices.htm
- (3) Standardized Fertilization Recommendations for Agronomic Crops, UF-IFAS Fact Sheet SL-129, <http://edis.ifas.ufl.edu/SS163>
- (4) USDA-NRCS Waste Utilization, Code 633, FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg/>
- (5) USDA-NRCS Feed Management, Code 592, FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg/>

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2.0 ALTERNATIVE CATTLE WATER SOURCES

Beef cattle, like humans, need a reliable source of freshwater in order to survive. Water requirements are influenced by several factors, including rate of gain, pregnancy, lactation, activity, type of diet, feed intake, and air temperature. These requirements are generally met by water originating from wells, surface waters, upland ponds, and natural isolated wetlands, as well as moisture found in feed. Limiting water intake can depress animal performance more quickly than any other nutrient-related deficiency. Domesticated animals can live about 60 days without food, but only seven days without water.

On average, a beef cow's estimated daily intake of freshwater is between 11 and 15 gallons per day, depending upon the time of year and whether lactating cows are present. Hot weather can nearly double the daily water intake requirements, compared to winter months. Lactation can also increase the water intake needs significantly, since water intake during the latter stages of pregnancy can be 30% to 50% higher than normal.

Nonpoint source pollution problems on cattle operations can occur in the vicinity of watering sites and supplemental feed and/or loafing areas, where animals tend to congregate most often. Using stagnant sources of surface water alone can also pose health hazards to livestock. Cattle liver fluke and Leptospirosis are waterborne diseases that can infect other members of the herd. Therefore, providing

fresh water and strategically locating supplemental feed facilities away from perennial streams and major discharge canals will help keep livestock out of critical watercourses. Artificial shade structures may also be used to encourage the use of upland sites for shading and loafing. These planning considerations are essential components to avert water quality problems related to livestock distribution. This is especially important when stocking rates are increased and pasture rest periods are minimized. Ultimately, careful planning and site-specific decisions involving alternative cattle water sources can have a significant role in protecting water quality and can preclude the need to install costly exclusion fencing adjacent to natural watercourses.

Working Definition:

Alternative cattle water sources are strategically located freshwater sources such as upland excavated ponds, artesian wells, watering troughs, and/or other surface water sources that provide adequate drinking water away from sensitive water resources.

2.1 Water Needs Inventory

- ✓ 1. Inventory existing water sources and average herd size to ascertain the estimated water use (daily intake of water), to ensure that a 7-day supply of water is always available in herd management areas.

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- ✓ 2. Review water management district records on regional well water quality data, particularly with regard to total dissolved solids and sulfates, as this may affect animal health.

2.2 Upland Pond Construction Criteria

- ✓ 1. Construct new ponds by embankment or excavation, keeping the pond size between $\frac{1}{4}$ and 2 acres, and locating it at least 50 feet away from wetlands, or further based on water management district requirements. Keep side slopes no steeper than a one-to-one horizontal to vertical ratio.
- ✓ 2. Construct cattle access areas with a minimum slope of three-to-one horizontal to vertical ratio.

2.3 Other Watering Sources

- ✓ 1. Locate watering troughs and associated shade facilities to keep cattle away from perennial streams or watercourses as much as possible.
- ✓ 2. Construct troughs or tanks with a stable base to reduce health hazards to livestock.
- ✓ 3. For piped withdrawals of non-regulated surface water sources, extend pipe at least 100 feet landward from the waterbody.

Operation and Maintenance:

- Maintain all wells, troughs, and other associated structures in good working order.
- If you suspect the animals are affected by a water-borne illness, carefully monitor animal health and conduct water quality sampling and analysis.
- Clean watering troughs frequently with dilute bleach.

References:

- (1) USDA-NRCS Pond, Code 378; Watering Facility, Code 614; Pipeline Code, 516; and Livestock Shade Structure, Code 717, FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (2) Beef Cattle Production Best Management Practices, LSU Ag Center, http://www.lsuagcenter.com/en/crops_livestock/livestock/beef_cattle/production_management/Beef+Cattle+Production+Best+Management+Practices.htm
- (3) Livestock and Water, North Dakota State University, AS-954, <http://www.ag.ndsu.edu/pubs/ansci/livestoc/as954w.htm>
- (4) Water for Livestock Using Solar Generated Electricity, UF-IFAS Fact Sheet EES-97, <http://www.p2pays.org/ref%5C08/07682.pdf>

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3.0 PRESCRIBED GRAZING

Before land was deeded to private ownership, historical ranching in Florida consisted of native range grazing practices. The knowledge and wisdom gained by early cowboys driving cattle over a vast expanse is still evident today. Some operations still practice the age-old art of native range grazing, whereby natural grasslands, scrublands, and savannas provide adequate forage for low-density stocking rates. In these operations, livestock are normally grazed at a rate of one *animal unit* to more than six acres, depending on the condition of the range site. Given today's financial constraints, grazing systems generally fall under the **prescribed grazing** category. All grazing systems have advantages and disadvantages. The requirements of a grazing system and the goals of the ranch manager should be matched to provide environmentally and economically sound options.

The potential for non-point source pollution from rangeland livestock depends primarily on stocking rate, length of grazing period, season of use, manure deposition sites and location. Normally, well-managed pastures and rangeland present little to no water quality problems from cattle excrement alone. In this scenario, most of the available phosphorus from excrement decomposition is re-used in the system via the phosphorus cycle. Problems may occur in cases where animals congregate for feeding, watering, and resting in close proximity

to surface waters; however, most of the problems associated with high phosphorus discharge are generally linked to soil erosion and sediment transport stemming from these activities. To counter this, pasture and rangeland water quality can be effectively managed by proper distribution of cattle, along with the strategic placement of supplemental feeding, mineral stations, and alternative water sources away from surface waters. Installing fences and subdividing large pastures to exert more control over the frequency and timing of grazing can also improve grazing distribution. Poor grazing management will lead to nutrient losses and invasion of undesirable plant species. Good planning and management on pastures, using rotational grazing principles, can effectively sustain the herd and prevent pollution problems.

Working Definition:

Prescribed grazing is managing the harvest of vegetation with grazing and/or browsing animals.

3.1 Prescribed Grazing Guidelines

- ✓ 1. Manage forage grazing of pastures or **paddocks** based on established stubble heights to maintain plant vigor, prevent soil erosion, and maintain soil moisture levels. Base prescribed grazing schedules on the rate of plant growth, available forage and

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utilization, not on calendar dates. Carefully monitor available forage to ensure it is adequate to meet animal demand.

- ✓ 2. Use rotational grazing or other measures to give concentrated areas time for re-growth between grazing periods, and to achieve a more even manure distribution across the pasture.
- ✓ 3. Incorporate a flash grazing system in established wetland exclusion areas to manage the existing vegetation without degrading the resource.
- Maintain grazing records by pasture, and develop a contingency plan for floods and droughts in order to adjust the required grazing demands.

Note: Do the Advanced-Level BMP Needs Assessment to determine whether to implement the BMPs below.

3.2 Level II - Comprehensive Prescribed Grazing

- ✓ 1. Initiate grazing only after the predominant forages have reached acceptable plant height(s), and rotate or remove livestock when grazing results in minimum leaf length(s) per NRCS recommendations in Code 528. Plan the rest periods for predominant forages based on the season of the year.

- ✓ 2. Incorporate cross-fencing to subdivide larger pastures so that rotational grazing is more effective.

- Keep records on stocking numbers, grazing days, and length of rest periods for each pasture or field.

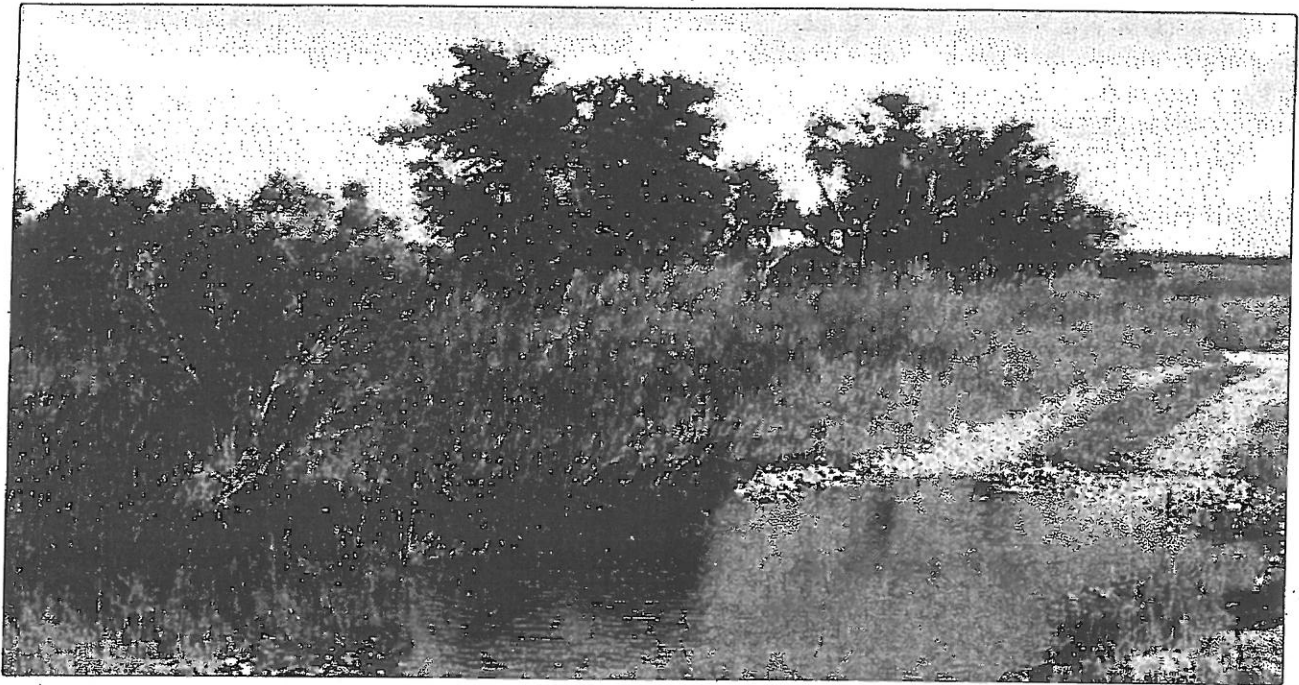
Operation and Maintenance:

- Maintain all fences, wells, troughs and other associated structures in good working order.
- Review and revise grazing management plans as needed, or at least annually.

References:

- (1) USDA-NRCS Prescribed Grazing, Code 528; Pasture and Hayland Planting, Code 512; Range Planting, Code 550; FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (2) Beef Cattle Production Best Management Practices, LSU Ag Center, www.lsuagcenter.com/en/crops_livestock/livestock/beef_cattle/production_management/Beef+Cattle+Production+Best+Management+Practices.htm
- (3) National Management Measures for the Control of Nonpoint Pollution from Agriculture, EPA Document No. 841B03004, <http://www.epa.gov/nps/agmm/>

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4.0 SEDIMENT AND EROSION CONTROL MEASURES

Some farm practices may inadvertently affect the quality of water discharged offsite. Removal of natural vegetation and topsoil increases the potential for soil erosion, which can change runoff characteristics and result in loss of soil and increased turbidity and sedimentation in waterbodies. Sediments along with sorbed nutrients and pesticides may be carried in runoff, and can negatively affect adjacent surface waters.

The first step in preventing erosion and sediment transport is to limit the amount of land that is cleared of vegetation. When clearing vegetation to develop new pastures, re-vegetation should occur as quickly as possible to limit erosion. Whenever possible, land clearing activities should be planned and conducted during the dry season. The second step in preventing erosion and sediment transport involves the use of BMPs, as discussed below. However, keep in mind that installing some of these may require technical assistance.

Whenever ranchers are conducting activities that create a significant risk to water resources, they should use the most appropriate BMPs based on site-specific conditions. The use of more common erosion-control practices (e.g., vegetation, mulch, land leveling) and sediment control devices (e.g., silt fences, check dams, sediment traps) should be employed in progression. Consider using the more passive erosion control measures first, in order to

prevent sediment transport. If more protection is needed, sediment control devices can be used next to capture sediment-laden water and allow enough time for larger particles to settle out. By following these practices, ranchers can prevent erosion and sedimentation impacts, which will not only protect the water resources, but also will ensure long-term productivity of agricultural farmland.

Working Definition:

Sediment and erosion control measures are permanent or temporary practices to prevent sediment loss from fields, attenuate water flow, and/or trap and collect debris and sediments in runoff water.

4.1 General Erosion and Sediment Control Measures

- ✓ 1. Minimize the amount of vegetation that is cleared when doing construction work.
- ✓ 2. Perform land clearing during the dry season.
- ✓ 3. Vegetate new road banks and other disturbed areas within 14 days of construction. As an alternative to seeding, consider using bermudagrass plugs, sprigs, or sod.
- ✓ 4. Use rock crossings when constructing roads across streams and creeks that have low-flow conditions.
- ✓ 5. Manage livestock to prevent significant erosive trails from developing.

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If more protection is needed to control particulate matter, use the two BMP groups below to enhance the level of protection for your operation. They are listed and used progressively (least to most protective) to provide an increasing level of protection.

4.2 Silt Fences

- ✓ 1. Use silt fences when protection is needed for 3 months or less. They can intercept and detain small amounts of sediment and can decrease the velocity of water under sheet-flow conditions. Use them during construction activities and install them at property boundary lines when a discrete point of discharge exists. Silt fences must be properly trenched in, backfilled and compacted in accordance with the Florida Stormwater, Erosion, and Sediment Control Inspector's Manual referenced below.

Note: Do the Advanced-Level BMP Needs Assessment to determine whether to implement the BMPs below.

4.3 LEVEL II - Check Dams

- ✓ 1. Install check dams in drainage ditches that have defined flow and experience recurring sedimentation problems. Install them downstream from the disturbed area, perpendicular to the direction of flow. These devices can be created using a variety of materials such as rock, rip rap, or sand bags. Space check dams so that the bottom of the uphill dam is the same height as the top of the downstream dam, or implement BMP 4.4 below.

4.4 LEVEL II - Sediment Traps

- ✓ 1. Install sediment traps within canals or near cowpens when conditions warrant. Clean out traps periodically, as sediment will accumulate.
- ✓ 2. Maintain or replace associated flashboard riser water control structure(s) when a drainage outlet exists, and you have experienced significant recurring erosion problems.

4.5 LEVEL III - Grade Stabilization Structures

- ✓ 1. Remove all vegetative debris and other objectionable material so that it will not interfere with the construction or proper functioning of the grade stabilization structure.
- ✓ 2. Vegetate disturbed areas within 14 days of construction. As an alternative to seeding, use plugs or sprigs for quick cover.
- ✓ 3. Fence the area around the structure to exclude livestock, which can cause erosion and sedimentation problems at the structure.

- ✓ 4. Install structures during dry conditions, and properly de-water the site beforehand.
- ✓ 5. Place fill in horizontal layers, not to exceed four inches in thickness, and compact the fill. Spread or dispose excess fill material in a manner not to interfere with the functioning of the structure.
- ✓ 6. Make provisions to prevent damage from overtopping the structure, and to divert excess flows away from the structure. On structures with drainage areas of 3 acres or less, overtopping of the structure is permitted only if damage will be minor.
- ✓ 7. On pipe island-type or side-inlet drainage structures where the effective height is less than 10 feet and the vertical drop is less than 10 feet from natural ground to normal water level, ensure that earth embankments at or around the structures have side slopes no steeper than 2 horizontal to 1 vertical.
- ✓ 8. Contact USDA-NRCS or FDACS for technical assistance and/or structure design guidance.

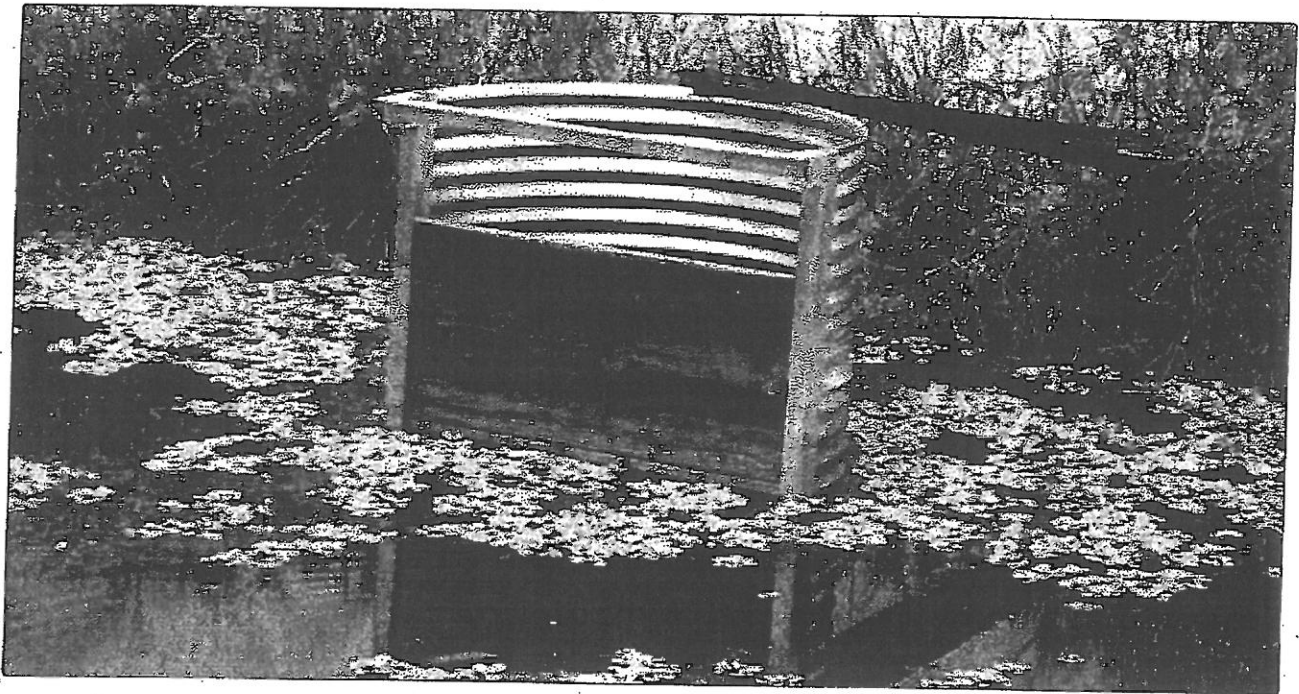
Operation and Maintenance:

- Remove any sediment deposits on screens when they reach one half the height of the barrier.
- Keep heavy equipment off of newly vegetated areas until they are established.
- Consider reusing sediment basin water for routine irrigation needs, so long as water volumes and quality warrant.

References:

- (1) USDA-NRCS Sediment Basin, Code 350; Fence, Code 382; Grade Stabilization Structure, Code 410; Animal Trails and Walkways, Code 575; Water and Sediment Control Basin, Code 638; Structure for Water Control, Code 587; FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (2) Farming for Clean Water in South Carolina: A Handbook of Conservation Practices, <http://www.epa.gov/owow/nps/bestnpsdocs.html#agriculture>
- (3) The Florida Stormwater, Erosion, and Sediment Control Inspector's Manual, FDEP, <http://www.dep.state.fl.us/water/nonpoint/docs/erosion/erosion-inspectors-manual.pdf>
- (4) USDA Planning and Design Manual for the Control of Erosion, Sediment, and Stormwater, <http://www.abe.msstate.edu/csd/p-dm/index.php>
- (5) National Management Measures for the Control of Nonpoint Pollution from Agriculture, EPA Document No. 841B03004, <http://www.epa.gov/nps/agmm/>

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5.0 WATER RESOURCES MANAGEMENT

Florida receives an average of 53 inches of rain per year. However, rainfall amount varies across the state by region, season, and year. Average rainfall tends to decrease as you move toward the central and southeastern parts of the state, and increase as you move toward the northwestern part of the state. In general, rainfall tends to occur more frequently during the summer months in Florida, especially in the central and southern areas of the state.

Water management and nutrient loading to surface waters are linked. For most cattle operations in Florida, key water resources management issues involve:

1. Properly planning for water supply needs for irrigation of forage and/or supplemental cattle watering.
2. Following good construction practices if using swales, ditches and/or canals for drainage in improved pastures.
3. Evaluating the potential to install or manage existing water control structures to hold water onsite, as much as possible.

All three of the above items affect the hydrologic conditions and runoff potential of pastures. Ranches typically have lower nutrient concentrations, but may experience higher volume discharges, due to large land areas. Leaving boards in water control

structures will reduce the volume of discharge and sediments, and improve water quality.

Alteration of the land, which may include construction of impervious surfaces such as roads, driveways, parking lots and agricultural structures increases stormwater runoff during rainfall events. Soil compaction in high-traffic areas can reduce soil permeability and increase stormwater runoff. Improper stormwater management leads to onsite and offsite flooding, increased pollutant loading to surface and ground waters, erosion and sedimentation, and the loss of valuable fresh water resources. The need to address these stormwater impacts has led to the implementation of a comprehensive stormwater management program that is implemented cooperatively by FDEP and the water management districts to minimize flooding and stormwater pollution. All new development activities, and some agricultural activities, especially those that alter onsite hydrology, are required to obtain an Environmental Resource Permit (ERP). Some farms may already have an ERP or other WMD surface water management permit that incorporates onsite stormwater management requirements.

While cow/calf operations generally do not lead to stormwater problems, there may be individual farm circumstances that create the need for specific stormwater management practices. Appendix 10 contains guidance and planning considerations to

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address these circumstances. The construction of a stormwater management system (e.g., retention or detention pond) may require an ERP or other WMD surface water management permit. Therefore, please check with your WMD before beginning construction of any stormwater management system.

Working Definition:

Water resources management includes good planning and water use practices, and strategic placement of water control structures to manage surface water resources effectively.

5.1 Water Supply

- ✓ 1. Know the quantity and quality of the irrigation water source.
- ✓ 2. Determine the general water requirements for primary forage grasses in improved pastures. Crop water requirements refer to the actual water needs for evapotranspiration (ET) and plant growth, and generally depend on crop-specific and climatic factors. Adjust irrigation amounts to forage plant needs.

5.2 Ditch Construction And Maintenance

- ✓ 1. Follow appropriate grades and plans during ditch excavation. Deposit *spoil* material in a manner so it cannot be reintroduced into the ditch or canal. Keep in mind that ditches have an engineered limit or *conveyance capacity* that governs how much water the ditch can store or convey.
 - ✓ 2. Use appropriate setback distances when constructing drainage ditches close to wetlands to avoid *hydraulic drawdown* impacts.
 - ✓ 3. Protect canal or ditch banks from erosion in areas subject to high water velocities, using *rip-rap*, concrete, headwalls, or other buffering materials. Take the appropriate steps to prevent livestock from damaging ditch banks.
 - ✓ 4. Selectively control broadleaf vegetation on ditch banks to maintain a vegetative cover that is compatible with existing pasture vegetation.
 - ✓ 5. Maintain all main ditch features regularly by removing unconsolidated sediments to retain the designed, cross-sectional area.
- Keep records of all ditch maintenance activities, and keep any records that relate to ditch design cross-sectional area.

5.3 Installation of Water Control Structures

- ✓ 1. If economically feasible, install water control structures at ranch outfalls, and/or the outfall of historically drained isolated or contiguous wetlands. Doing this will rehydrate these wetlands and provide onsite water quality treatment opportunities. A fixed weir is one device that may be used to help maintain *normal pool* water levels within these wetlands.
- ✓ 2. Maintain boards in all structures to reduce discharge volume, and especially use boards at the end of the dry season to keep the first flush of nutrients onsite.

Before installing new (non-replacement) water control structures, contact FDACS, USDA-NRCS, the applicable water control district and/or your water management district to see if technical assistance or permitting may be required.

5.4 Grassed Waterways

- ✓ 1. Install a grassed waterway to divert runoff from upland pasture areas around any concentrated areas such as cowpens that are near watercourses, streams, wetlands, or sinkholes. Design the grassed waterway in accordance with USDA-NRCS specifications.

Operation and Maintenance:

- Replace dilapidated water control structures with structures matching original specifications and use good sediment control measures.
- Routinely remove any accumulated aquatic weeds at the control structure(s) to maintain proper drainage and prevent secondary environmental impacts. Use a combination of physical control (e.g. floating barriers, screens, etc.), biological control (e.g. herbivorous fish), and chemical control (e.g. selective herbicides labeled for aquatic applications) to suppress and reduce aquatic weed problems.

References:

- (1) USDA-NRCS Irrigation Field Ditch, Code 388; Grassed Waterway, Code 412; Structure for Water Control, Code 587; Surface Drainage (Field Ditch), Code 607; and Surface Drainage (Main or Lateral), Code 608; FOTG-Section IV <http://www.nrcs.usda.gov/technical/efotg>
- (2) Design and Construction of Surface Drainage Systems on Agricultural Lands in Humid Areas, American Society of Agricultural and Biological Engineers, Standard EP 302.4,

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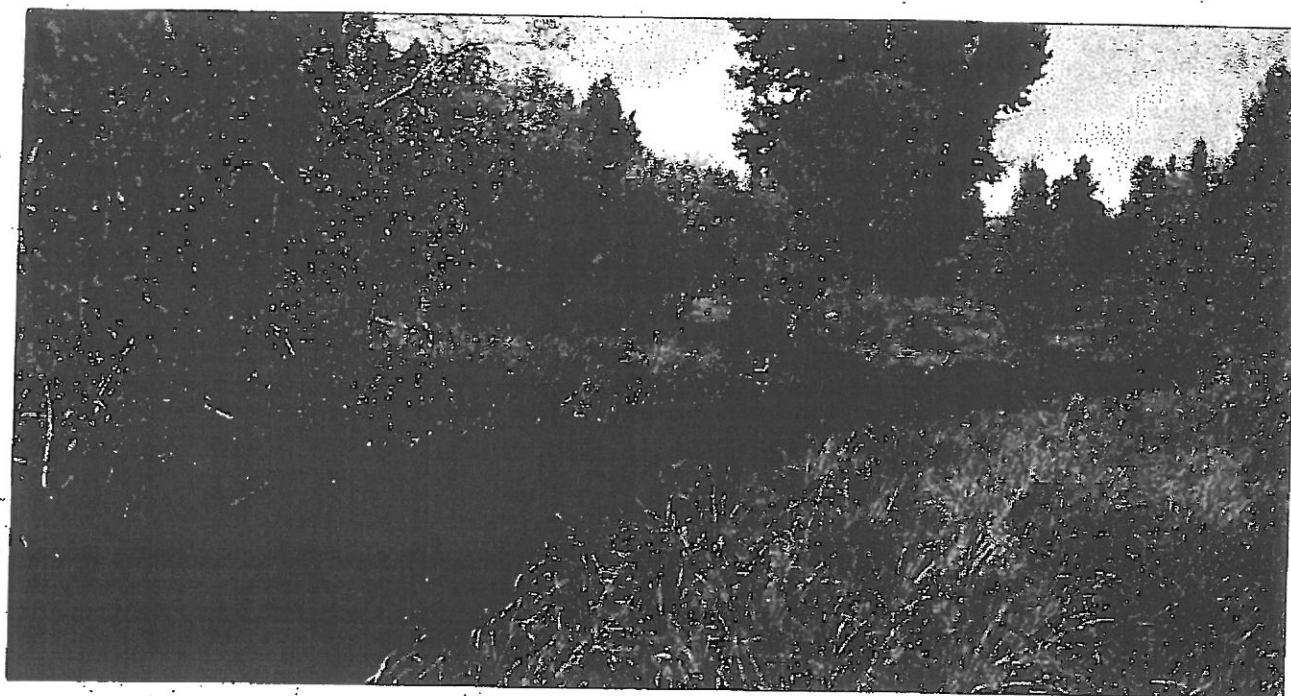
(3) American Society of Agronomy: Drainage for Agriculture, <http://www.agronomy.org>

(4) The Florida Stormwater, Erosion, and Sedimentation Control Inspectors' Manual, FDEP, <http://www.dep.state.fl.us/water/nonpoint/docs/erosion/erosion-inspectors-manual.pdf>

(5) National Management Measures for the Control of Nonpoint Pollution from Agriculture, EPA Document No. 841B03004, <http://www.epa.gov/nps/agmm/>

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6.0 CONSERVATION BUFFERS

For the purposes of this manual, conservation buffers include field borders, filter strips and *riparian* buffers. They are generally non-tilled areas and can be selectively used in cow/calf operations to provide an additional level of water quality treatment, especially near sensitive discharge areas. Field borders are strips of permanent vegetation, either natural or planted, at the edge or perimeter of fields. They function primarily to help reduce erosion from wind and water, protect soil and water quality, and provide wildlife habitat. Filter strips are areas of permanent vegetation between farm fields and adjacent to environmentally sensitive areas. Their main purpose is to decrease the velocity of runoff water and remove sediment particles before they reach surface waters. Riparian buffers are areas of trees, shrubs and/or grasses located adjacent to natural streams, which help reduce excessive amounts of sediment, organic material, nutrients, and pesticides in surface water sheetflow. Riparian buffers are most effective on highly sloped lands when positioned next to perennial or intermittent streams with high ground water recharge potential.

Working Definition:

Conservation buffers are permanently vegetated, non-cultivated areas that function to retain water and soil onsite to help reduce pollutants in surface water runoff.

6.1 Field Borders

- ✓ 1. When creating new improved pastures on previously idle land adjacent to urban areas, install or maintain field borders around the perimeter or, at a minimum, in areas where runoff enters or leaves the pasture.
- ✓ 2. Plant borders during the time of year that will assure the most success for survival, and consider using native species and/or overseeding the border with legumes for plant diversity and wildlife benefits.

6.2 Filter Strips

- ✓ 1. Install a filter strip to treat runoff from concentrated livestock areas, such as feed areas or cowpens that are directly adjacent to wetlands and sinkholes.
- ✓ 2. Design the filter strip based on peak discharge from the concentrated waste area, and generally base this calculation on a 2-year, 24-hour rainfall event. Construct the treatment area wide enough to convey the flow at a depth of 0.5 feet or less, with the length sufficient to provide at least 15 minutes of flow-through time.

6.3 Riparian Buffers

- ✓ 1. Install or maintain a riparian buffer or filter strip

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on pasture areas that exceed 1% slope and discharge directly to streams. Specifically:

- Maintain an existing riparian buffer as an alternative to fencing when conditions warrant. Refer to the Fence Installation BMP in this manual for more information.
- Locate and size any stream crossings to minimize impacts to riparian buffer vegetation and function. Refer to USDA-NRCS Stream Crossing, Code 578 for design criteria.
- Select shrub and tree species based on their compatibility in growth, water, and shade tolerance.

Contact FDACS, USDA-NRCS or a Technical Service Provider approved by the USDA-NRCS for assistance in properly designing the riparian buffer in accordance with USDA-NRCS Codes 390 and/or 391 in the Key References section below.

Operation and Maintenance:

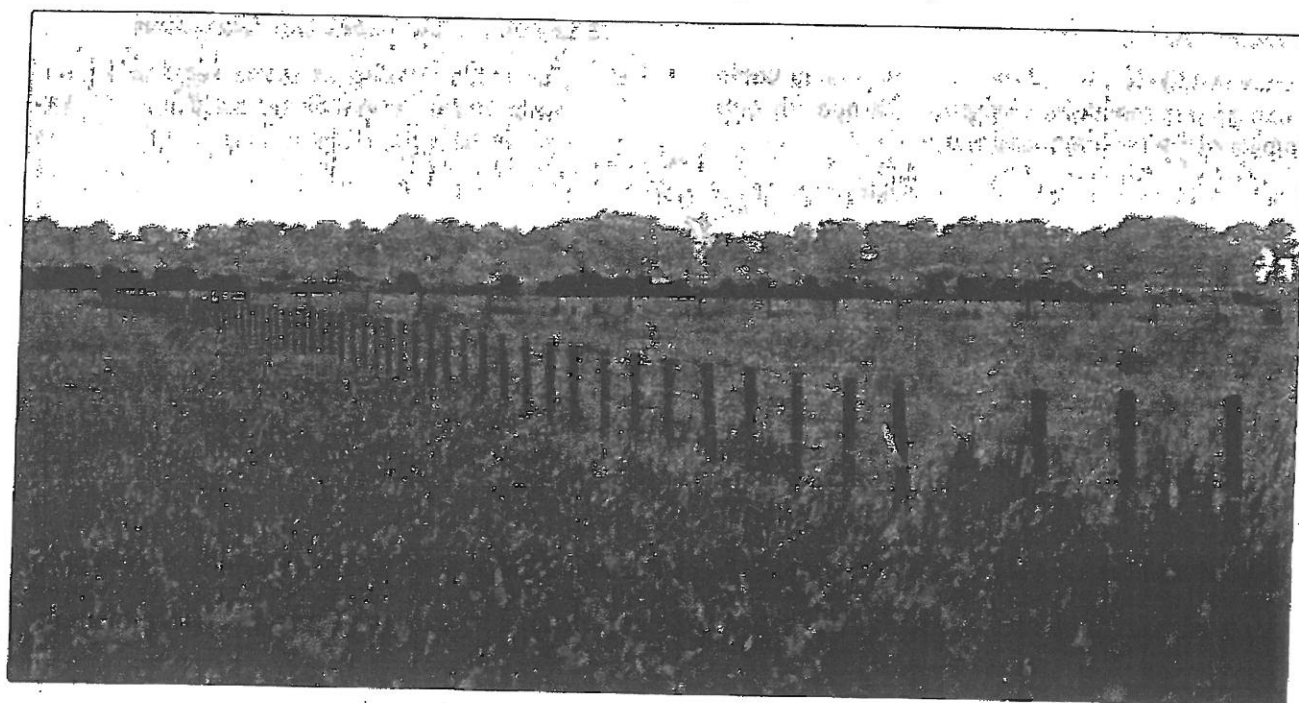
- Inspect conservation buffers periodically, and restore as needed in order to maintain their intended purpose.
- Do not overuse fertilizers, pesticides, and other chemicals in maintaining buffers.
- Repair rills and small channels that may develop across the buffers, and reseed as necessary.

- Use proper grazing or haying management practices to maintain the integrity of grassed waterways, if applicable.
- If rollerchopping, conduct these activities in accordance with USDA-NRCS guidelines and use prescribed burns as necessary to maintain the native vegetation within the buffer and to discourage the establishment of nuisance exotic vegetation.

References:

- (1) USDA-NRCS Field Border, Code 386; Riparian Herbaceous Cover, Code 390; Riparian Forest Buffer, Code 391; Filter Strip, Code 393; and Grassed Waterway, Code 412; FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (2) National Management Measures for the Control of Nonpoint Pollution from Agriculture, EPA Document No. 841B03004, <http://www.epa.gov/nps/agmm/>
- (3) General Specifications for Establishing Riparian Forest Buffers, USDA-NRCS FL Technical Note Forestry FL-17, <http://www.usda.nrcs.gov/>
- (4) Farming for Clean Water in South Carolina: A Handbook of Conservation Practices, <http://www.epa.gov/owow/nps/bestnpsdocs.html#agriculture>
- (5) Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Universal Soil Loss Equation, USDA Agricultural Research Service, Agricultural Handbook No. 703, <http://www.ars.usda.gov/Research/docs.htm?docid=5974>

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7.0 FENCE INSTALLATION

Fences are usually installed across pasture lands and around the perimeter to allow for rotation, deferment, and resting of grazing lands. Exclusion fencing is sometimes required adjacent to *perennial streams* to prevent cattle from entering these waters. This helps reduce the occurrence of animals standing in water, streambank erosion problems, and water quality degradation.

Nonpoint source pollution from rangeland livestock depends primarily on stocking rate, length of grazing period, season of use, concentrated manure deposition sites, and proximity of livestock to the nearest watercourse. Receiving waters, particularly areas that may be defined as *waters of the state* should be reasonably protected from point source discharges (via structures) resulting from livestock. This is especially true in summer time when livestock have a tendency to congregate in natural waterbodies or artificially dug watering areas to cool off. If the number of animals and frequency of occurrence are high, this may result in adverse stream bank damage, erosion, and/or nutrient and bacterial loadings. Livestock may also gravitate towards deep-water wetland habitats that have standing water during most of the year, such as swamps and marshes. Some of these wetlands may be hydrologically connected to downstream watercourses. Consequently, it is important to calculate your livestock's water needs and assess whether the

available water resources are adequate to provide a year-round freshwater supply for the herd without the resources being adversely affected.

Large-scale exclusion fencing may be logistically impractical or cost-prohibitive. Before installing exclusion fencing, ranchers should consider all alternative approaches. In many cases, exclusion of livestock from watercourses and associated riparian areas can be accomplished using riparian buffers and proper grazing management, and/or placing feed, water, and shade structures in upland areas. Ranchers dealing with this issue should first use all reasonable methods in the *Alternative Cattle Water Sources and Conservation Buffer (Riparian Buffer) BMPs* as an option to installing exclusion fencing.

Once fences are installed, it is very important to maintain them. Regular inspection of fences should be part of an ongoing management program. Inspection of fences after major storm events and wildfires is recommended to maintain their intended use. The location and construction of all fences and storage of fence materials should comply with local, state, and federal laws. Landowners are encouraged to consult with water management district staff and USDA-NRCS prior to conducting land clearing activities and associated fencing projects in surface waters or wetlands, to ensure that proper authorization is obtained, if needed.

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Working Definition:

Fence installation is a method of managing cattle in an area to maintain, or improve the quantity and quality of the natural resources.

7.1 General Fence Installation

- ✓ 1. Perform land clearing before fence installation. Minimize vegetation removal and soil disturbance.
- ✓ 2. Use compatible fencing material based on the site's soil and water properties, and construct fences or barriers so they are structurally adequate for their intended purpose.
- ✓ 3. Adjust stocking rates to ensure uniform grazing, or subdivide larger pastures using fencing.
- ✓ 4. Stabilize stream banks, then either: provide adequate alternative cattle water sources, such as watering troughs or upland excavated ponds; or install and maintain exclusion fencing to control cattle access when cattle graze in predominately improved pastures that contribute runoff to perennial streams.
- ✓ 5. As an alternative to fence installation, provide or maintain a riparian buffer to create a natural barrier landward of the stream when cattle graze in predominately native or semi-improved pastures that contribute runoff to perennial streams.

7.2 Fence Installation In Wetlands

- ✓ 1. When installing fences in wetlands, minimize the use of mechanical equipment, and keep the cleared area no wider than 12 feet on average on either side of the fence. Do not dredge or fill within the wetland.
- ✓ 2. Perform all work during the dry season, when there is no standing water in the wetland.

Note: Do the Advanced-Level BMP Needs Assessment to determine whether to implement the BMPs below.

7.3 LEVEL II - Livestock Use Exclusion

- ✓ 1. For cattle grazing in areas regulated by a water management district surface water permit, install and maintain exclusion fencing on each side of and across the ranch drainage canal at a minimum distance of 300 feet (or greater if required by permit) from outfall(s) that connect offsite to waters of the state. This distance only applies to the measurement taken from the outfall to a point upstream 300 feet.
- ✓ 2. For cattle grazing in areas not regulated by a water management district surface water permit, install and maintain exclusion fencing on each side of and across the ranch drainage canal at a minimum distance of 500 feet from outfall(s) that connect offsite to waters of the state. This distance only applies to the measurement taken from the outfall to a point upstream 500 feet.
- ✓ 3. Install and maintain permanent or temporary exclusion fencing along areas directly adjacent to perennial streams when these areas have significant rill or gully erosion.

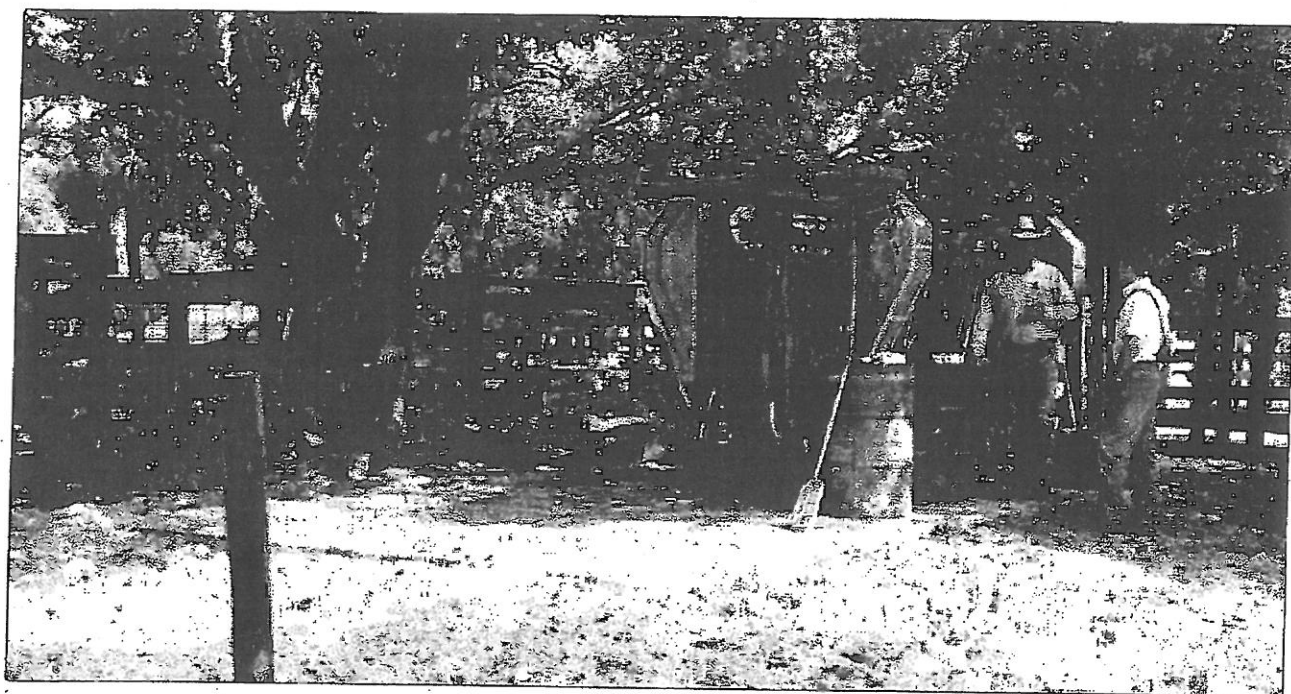
Operation and Maintenance:

- Maintain all fences, watering troughs, and shade structures in good working order to prevent animals from congregating in waterbodies.
- Repair rill and gully erosion when installing an exclusion fence.

References:

- (1) USDA-NRCS Fence, Code 382; and Use Exclusion, Code 472; FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (2) Beef Cattle Production Best Management Practices, LSU Ag Center http://www.lsuagcenter.com/en/crops_livestock/livestock/beef_cattle/production_management/Beef+Cattle+Production+Best+Management+Practices.htm
- (3) National Management Measures for the Control of Nonpoint Pollution from Agriculture, EPA Document No. 841B03004, <http://www.epa.gov/nps/agmm/>
- (4) Streamside Livestock Exclusion, Virginia Tech Cooperative Extension, Publication No. 442-766, <http://www.ext.vt.edu/pubs/bse/442-766/442-766.html>

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8.0 HIGH-INTENSITY AREAS

High-intensity areas, where livestock are confined or congregate for extended periods of time, can adversely impact both the environment and the animal's health. Feeding areas, holding or cow pens, watering troughs, and shaded or covered shelter areas may create high-intensity areas. Proper management of these areas will alleviate environmental concerns, support livestock health, and improve the overall aesthetics of the cow/calf operation.

Working Definition:

High-intensity areas are parts of a cow/calf operation used intensively by livestock for short periods of time, resulting in denuded ground cover.

8.1 High-Intensity Area Management

- ✓ 1. Locate new cowpens a minimum 200 feet away from watercourses, streams, wetlands, wells or sinkholes, and construct a berm to prevent runoff.
- ✓ 2. Direct runoff from high-intensity areas away from watercourses, streams, wetlands, wells or sinkholes using grassed waterways or swales. This can be used as part of a treatment train in conjunction with sediment traps.

Note: Do the Advanced-Level BMP Needs Assessment to determine whether to implement the BMPs below.

8.2 LEVEL II – Design Retrofits

- ✓ 1. Apply aggregate surfaces such as crushed rock or gravel in and around these areas to prevent erosion.
- ✓ 2. Install filter strips, conservation buffers, or berms/diversions to treat discharges into watercourses, streams, wetlands, wells or sinkholes.

Operation and Maintenance:

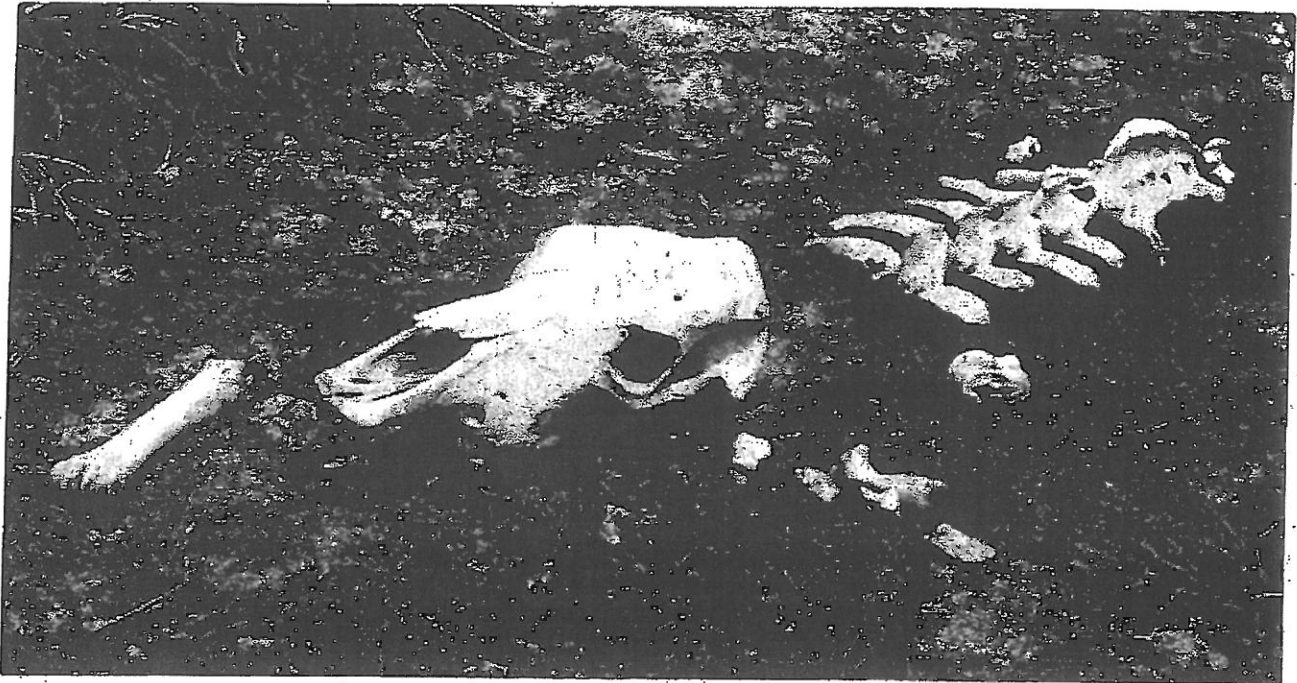
- Inspect fencing and structures regularly and make necessary repairs.
- Periodically clean or remove excess manure from these areas.
- Inspect these areas after severe weather events to ensure runoff has been properly contained or diverted.
- Use agronomic practices to re-vegetate denuded areas.

References:

- (1) USDA-NRCS Heavy Use Area Protection, Code 561; FOTG-Section IV <http://www.nrcs.usda.gov/technical/efotg>
- (2) Effect of Stocking Rate on Measures of Cow-Calf Productivity and Nutrient Loads in Surface Water Runoff, UF-IFAS AN-14, <http://edis.ifas.ufl.edu/>
- (3) National Management Measures for the Control of Nonpoint Pollution from Agriculture, EPA Document No. 841B03004, <http://www.epa.gov/nps/agmm/>

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9.0 ANIMAL MORTALITY

Animal carcasses contain microorganisms. Some of these organisms may be pathogenic (disease causing), either to animals of the same species or to different animal species. Proper management of animal carcasses will prevent the movement of pathogenic organisms to surface or ground water and therefore reduce the risk of transmitting diseases to healthy livestock. Proper management of carcasses will also protect surface waters from unwanted organic loads that can lower dissolved oxygen levels and kill fish. In addition, odor and nutrient enrichment problems can be prevented.

Carcass management will vary around the state, but viable alternatives include rendering, burning, burial, or hauling the carcass to an upland site away from other animals and water sources. Keep in mind that FDEP Rule, 62-701, F.A.C., for *Solid Waste Management Facilities* may apply if operators are faced with a catastrophic die-off of livestock, and have to dispose of these animals in accordance with state rule.

Working Definition:

Animal mortality BMPs involve the judicious management and disposal of dead animals to protect water quality and to provide increased protection to livestock and humans.

9.1 Sanitation And Disease Control Measures

- ✓ 1. Transport carcasses in a sanitary manner to prevent spreading infection.
- ✓ 2. Clean and disinfect any mechanical equipment surfaces that were in contact with the carcasses, especially if you suspect a more virulent disease organism to be the cause of death.
- ✓ 3. Report any of the dangerous diseases listed below to the State Veterinarian per the requirements in section 585.18, F.S.

Anthrax	Heartwater
Bont Tick infestation (Amblyomma)	Lumpy skin Disease
Bovine Piroplasmiasis (Cattle Tick Fever)	Peste des Petits Ruminants
Bovine Spongiform Encephalopathy	Pseudorabies (Aujeszky's Disease)
Brucellosis (B. abortus, B. suis)	Rabies
Southern Cattle Tick infestation (Boophilus)	Rift Valley Fever
Contagious Bovine or Caprine Pleuropneumonia	Rinderpest
Foot and Mouth Disease	Salmonella Enteritidis
	Scabies
	Screwworm infestation
	Tuberculosis
	Vesicular Stomatitis

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9.2 Disposal

- ✓ 1. Move carcasses to an upland area away from watercourses, streams, wetlands, wells, or sinkholes.
- ✓ 2. If a suitable site is available, locate any burial site at least 50 feet away from adjacent property owners, and at least 200 feet away from watercourses, streams, wetlands, wells or sinkholes. Identify this area on a map and keep the map handy for future reference.

9.3 Rendering And Incineration

- ✓ 1. Use a licensed rendering or incineration facility, if one exists locally.

Operation and Maintenance:

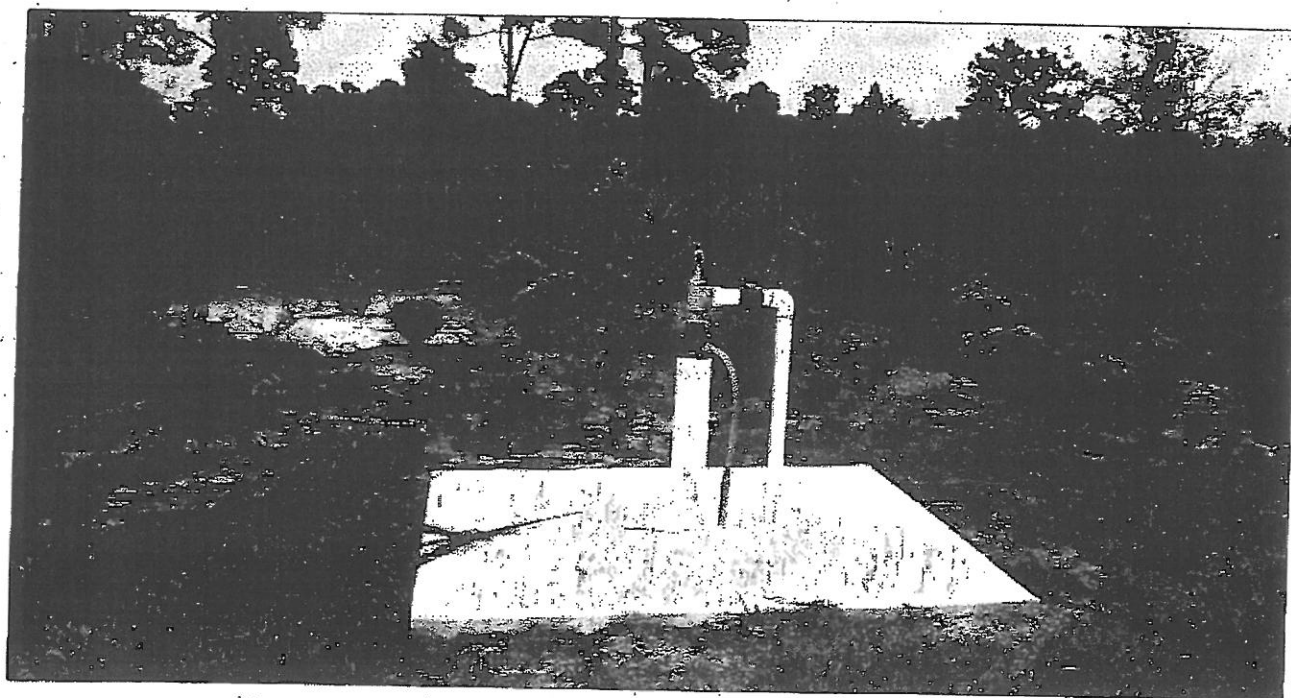
- Maintain soil stabilization practices until vegetation is re-established on top of burial sites.

- If composting, remember that animal carcasses are very high in nitrogen and have an average C:N ratio of 5:1. Because of this, they will likely require a supplemental carbon source to decompose properly.

References:

- (1) Beef Cattle Production Best Management Practices, LSU, http://www.lsuagcenter.com/en/crops_livestock/livestock/beef_cattle/production_management/Beef+Cattle+Production+Best+Management+Practices.htm
- (2) USDA-NRCS Animal Mortality Facility, Code 316; Composting Facility, Code 317; FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (3) Composting Animal Mortality, Minnesota Department of Agriculture, <http://www.mda.state.mn.us/animals/animals/composting.htm>
- (4) Chapter 585, Florida Statutes

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10.0 WELLHEAD PROTECTION

With the majority of Florida's water supply originating from underground sources, or *aquifers*, it is extremely important that ranchers make every effort to protect source waters. Successful wellhead protection ultimately involves the use of regulations and common-sense measures that address well placement and agricultural practices near wells. For new well construction, the initial focus should be on appropriate well location and sound well-construction practices. For all wells, it is important to conduct management activities near the wellhead that are aimed at reducing the potential for contamination. Wellhead protection is one of the most effective ways of protecting ground water quality and preventing human exposure to accidental contamination.

Working Definition:

Wellhead protection is the establishment of protection zones and safe land use practices around wells to protect source waters from accidental contamination.

10.1 Well Planning and Protection

- ✓ 1. Construct new wells up-gradient as far as possible from likely pollutant sources such as petroleum storage tanks, septic tanks, chemical mixing areas, and livestock confinement facilities.

- ✓ 2. Contact your regional water management district to see if the well requires a consumptive use or water use permit. Wells that serve public water systems must also meet the rule requirements of Chapter 62-521, F.A.C.
- ✓ 3. Cap or valve any existing *artesian* (flowing) wells, in accordance with water management district requirements.
- ✓ 4. For potable wells, exclude livestock within a 75-foot radius of the wellhead. This radius can be reduced if well construction records demonstrate well casing depths that extend through confining layers.

10.2 Well Construction and Operation

- ✓ 1. Use a licensed Florida water well contractor and drill new wells according to local government code and water management district well construction permit requirements.
- ✓ 2. At a minimum, surround new wells with a concrete slab approximately four (4) inches thick with a two (2) foot radius. Extend the casing above the ground surface a minimum of 12".
- ✓ 3. Retrofit existing functional wells with a concrete collar with a one (1) foot radius or fence to protect them from damage.

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- ✓ 4. Use backflow prevention devices at the well-head to prevent contamination.
- Maintain records of new well construction or modifications to existing wells. Proper records are important for future reference, in case problems arise with the well.

Operation and Maintenance:

- Try to maintain permanent vegetation within a 75-foot radius around wells.
- Inspect wellheads and pads regularly for leaks or cracks, and make any necessary repairs.
- Consider testing drinking water wells annually for coliform bacteria contamination to protect public health.

References:

- (1) USDA-NRCS Water Well, Code 642; and Diversion, Code 362; FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (2) Farm-A-Syst Program, <http://www.uwex.edu/farmasyst>
- (3) Aquifer Protection Program, SJRWMD, http://www.sjrwmd.com/technicalreports/pdfs/SP/SJ91-SP9_vol1.pdf
- (4) Water Well Permitting and Construction Requirements, FDEP Rule 62-532, F.A.C., <http://www.dep.state.fl.us/legal/Rules/rulelistnum.htm>

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11.0 WETLANDS AND SPRINGS PROTECTION

Wetlands and springs are important components of Florida's water resources. They often serve as spawning areas and nurseries for many species of fish and wildlife, perform important flood-storage roles, cycle nutrients in runoff water, contribute moisture to the hydrologic cycle, add plant and animal diversity, provide flash grazing opportunities, and offer valuable recreational opportunities for the public.

Wetlands are complex transitional ecosystems that provide a link between aquatic and terrestrial environments. Under Florida Law, "wetlands" are defined as areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas. They generally do not include longleaf or slash pine flatwoods with an understory dominated by saw palmetto.

Chapter 62-340, F.A.C., entitled "Delineation of the Landward Extent of Wetlands and Surface Waters" contains the methodology that must be used by all state and local governments in Florida to determine the boundary between wetlands and uplands and

other surface waters. The federal government (U.S. Army Corps of Engineers and USDA-NRCS) uses the "1987 Manual" to determine the boundary between uplands and waters of the United States, which includes wetlands in natural areas. The Food Security Act manual is used by USDA-NRCS to determine wetlands on agricultural lands. In most cases, the boundaries determined by both methodologies are the same or very close. Unauthorized impacts to wetlands may jeopardize USDA-NRCS cost-share benefits pursuant to the Food Security Act's Swampbuster provisions.

Springs, spring runs, and associated sinks are unique freshwater systems that emerge from the underlying limestone that is at or near the land surface. Springs are unique natural resource features and deserve special protection. Prior to substantial development in Florida, wetlands and spring systems once covered about half of the state's surface. That area has been greatly reduced, primarily because early water management efforts in Florida focused on draining wetlands to facilitate urban and agricultural lands development.

Working Definition:

Wetlands (defined in the glossary of this manual) are typically low landform areas with seasonal or permanent standing water that provide wildlife habitat and natural filtration. *Springs* are mostly

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clear surface waters that are naturally low in nutrients and originate from ground water that emerges to the land surface.

11.1 Wetlands Protection and Impact Avoidance

- ✓ 1. Use a county soil survey map to help identify "wetland" or hydric soil types and/or other depressional or frequently flooded areas.
- ✓ 2. Use preservation, practical design alternatives, or modifications to eliminate or reduce adverse impacts to wetlands and springs.
- ✓ 3. Maintain a minimum 25-foot vegetative buffer exterior to the landward extent of all wetlands that meet the state's delineation methodology. If you have a water management district permit (ERP, MSSW), you must follow the buffer requirements in the permit.
- ✓ 4. Obtain a USDA-NRCS wetland determination prior to conducting activities in a wetland. Failure to do so may jeopardize your federal cost-share eligibility.

11.2 Water Quality Treatment and Field Discharges

- ✓ 1. Minimize adverse water quality impacts to receiving wetlands by using pretreatment practices such as filter strips, conservation buffers, swales, or holding water onsite. This can substantially reduce pollutants, especially suspended solids, and allow the wetland to more naturally assimilate nutrients.
- ✓ 2. Rotate livestock through the wetland grazing system at an accelerated pace when excessive rainfall or mud becomes a persistent problem.

- ✓ 3. Use spreader swales or other means to encourage sheetflow through the wetland buffer prior to discharging water from existing pasture ditches.

11.3 Special Criteria for First and Second Magnitude Springs

- ✓ 1. Maintain a 100-foot vegetative buffer from springs, spring runs, and wet sinks.
- ✓ 2. Use split-applications for fertilizers on pasture areas that contribute surface water directly to springs, spring runs, and wet sinks.

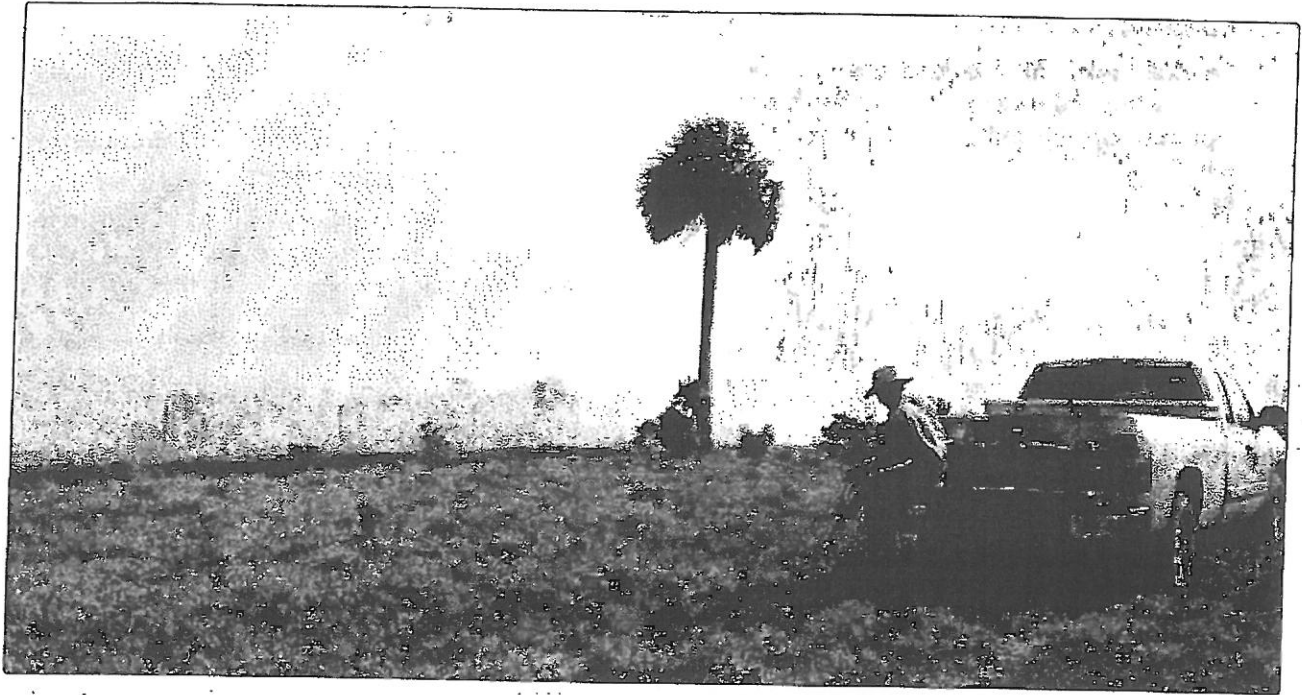
Operation and Maintenance:

- Limit the use of pesticides and fertilizers in and around wetlands and springs, and be careful to avoid spray drift impacts.

References:

- (1) USDA-NRCS Wetland Enhancement, Code 659; Prescribed Grazing, Code 528; Nutrient Management, Code 590; Filter Strip, Code 393; and Diversion, Code 362; FOTG-Section IV, 659, <http://www.nrcs.usda.gov/technical/efotg>
- (2) Water Management District's Environmental Resource Permitting Rule and Basis of Review, <http://www.dep.state.fl.us/water/waterpolicy/districts.htm>
- (3) Protecting Florida's Springs: Land Use Planning Strategies and Best Management Practices, Department of Community Affairs, www.dca.state.fl.us/fdcp/DCP/publications

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12.0 PRESCRIBED BURNING

Burning is a natural phenomenon in the flatwoods, marshes, and sloughs that make up the major rangeland areas in the state. Controlled use of fire is a valuable management tool, and is a natural component in forming plant communities and their structure. Prescribed burning suppresses many undesirable plant species to maintain their natural balance, and enhances the palatability and nutritional value of edible plants for wildlife and livestock. Reducing overpopulated brush and woody components in pastures and rangeland increases herbaceous vegetation, resulting in better forage and water-filtering capability. Furthermore, when prescribed burning is used to recycle accumulated litter and excessive brush in a beneficial way, the threat of wildfire is reduced.

Rangeland plant communities that depend upon periodic fires will quickly shift into transitional plant communities dominated by woody species when burning is suppressed. This shift will often reduce the usable area for wildlife and livestock. This is compounded as shading from woody plants inhibits the growth of grasses and other herbaceous plants. In addition, increased soil moisture uptake as a result of the woody plant overstory limits the available water needed for production of forage and ground water recharge.

Working Definition:

Prescribed burning is a cost-effective tool to reduce fuel buildup that can cause dangerous wildfire conditions, thus providing improved habitat for range management and increased protection to people, their homes, and the forest.

12.1 Burn Preparation

- ✓ 1. Develop and implement a burn prescription plan that includes emergency contingencies, or enlist the help of a Certified Prescribed Burn Manager to conduct prescribed burns. Courses are available for training in the basics and regulations of burning.
- ✓ 2. Ensure no burning bans are in effect, and that the proper permits, certification, and landowner permission are obtained prior to burning. Prescribed burns must be conducted in accordance with Florida Forest Service rules and section 590.125, Florida Statutes.
- ✓ 3. Use burning in conjunction with roller chopping when developing pastures in native areas that have an abundance of palmettos.
- ✓ 4. Burn only when weather conditions are favorable. Check wind conditions to ensure smoke from the burn will not adversely impact roadways or neighboring properties. Never leave a burn unattended.

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12.2 Construction Of Fire Lines

- ✓ 1. Carefully select fireline locations and avoid constructing them in wetlands. For firelines that are constructed with fencing through wetlands, follow the criteria in the "Fence Installation" BMPs.
- ✓ 2. Use alternatives to plowed firelines, such as harrowed strips, wet lines, or grass strips. Existing barriers such as roads, ditches or canals can also be used as firelines.
- ✓ 3. Construct firelines with the contour to minimize soil erosion.

12.3 Fire Safety And Control

- ✓ 1. Ensure that adequate fire equipment is on hand and that the fire does not burn too hot. An intense burn can overexpose the ground floor, leading to erosion and destruction of valuable habitat.
- ✓ 2. Ensure the fire is completely out before leaving the site.

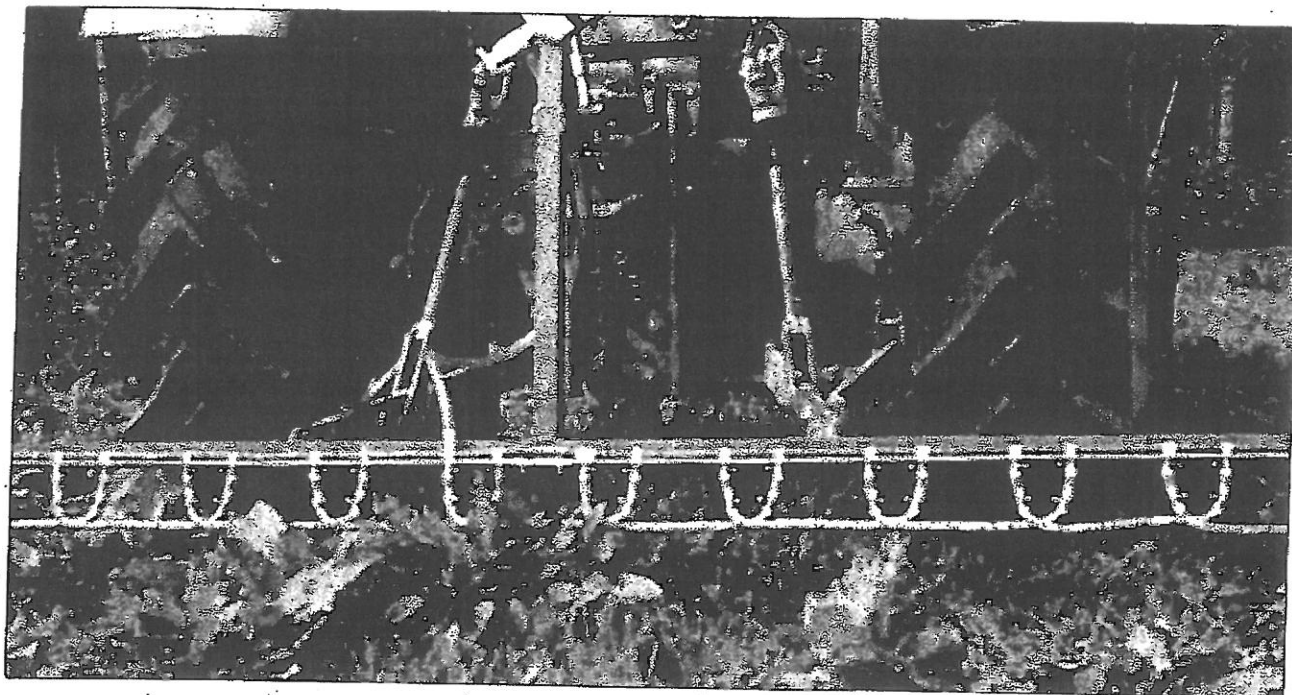
Operation and Maintenance:

- Maintain soil stabilization practices until vegetation is re-established.
- Check fence posts and other infrastructure for integrity after intense burns.
- Grazing should be deferred for 30-90 days after a burn during the growing season. This will help ensure that new growth is able to re-establish.

References:

- (1) USDA-NRCS Prescribed Burning Code 338, FOTG-Section IV, <http://www.nrcs.usda.gov/technical/efotg>
- (2) Prescribed Burning Fact Sheet, USDA-NRCS
- (3) BMPs for Prescribed Burning, South Carolina Forestry Commission, <http://www.state.sc.us/forest/rbpb.htm>
- (4) Wisconsin DNR Water Quality BMP Field Manual <http://www.wi.gov/forestry/usesof/bmp/bmptoc.htm>
- (5) Prescribed Burning Regulations in Florida, UF-IFAS FOR-67, <http://edis.ifas.ufl.edu/FR055>
- (6) Section 590.125, Florida Statutes

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13.0 INTEGRATED PEST MANAGEMENT AND PHARMACEUTICALS

Integrated pest management (IPM) is the approach of using scientific principles to manage problem pests. IPM does not mean that pesticides will be excluded. Instead, it means that pesticides are just one of many tools used to manage pests; however, pesticides should be used judiciously and only when needed. The goals of an IPM program are improved control of pests, more efficient pesticide management, more economical forage production, and reduction of potential hazards to humans and the environment through reduced pesticide exposure. IPM accomplishes these goals through the use of resistant plant species, improved cultural practices, biological control agents (parasitoids, predators), and selective use of pesticides. Although detailed IPM programs have not been developed for all types of cropping systems, IPM principles can be applied in many cases using applied science and logic. It is also important to predict economic losses and risks so the cost of various treatments can be compared to the potential losses.

Pharmaceutical misuse and waste handling, involving antibiotics and hormones, can have a negative impact on water quality and is an issue of increasing national concern. It is very important to use these products responsibly; therefore, follow all state and federal regulations and properly dispose of spent needles, expired or unused pharmaceuticals, and pharmaceutical containers.

Working Definition:

IPM is a broad, interdisciplinary approach to pest management using a variety of methods to systematically control pests.

13.1 General IPM Practices

- ✓ 1. Store pesticides in a roofed structure with a lockable door, at least 100 feet from surface waters.
- ✓ 2. When practical, construct a permanent mix/load facility with an impermeable surface, and locate it away from wells and/or surface waters. Where permanent facilities are not practical, use portable mix/load stations. When field mixing is necessary, loading activities should be conducted at random locations in the field with the aid of nurse tanks, if applicable. Use a check valve or air gap separation to prevent backflow into the tank when filling a sprayer.
- ✓ 3. Practice IPM and use all pesticides in accordance with the label. When applying a pesticide close to a stream, canal, pond or other sensitive waterbody, choose a pesticide with an active ingredient that has a lower toxicity to aquatic organisms.

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- ✓ 4. Rinse, recycle, or dispose of empty pesticide containers following federal, state, and/or local regulations.

13.2 Pharmaceutical Use and Disposal

- ✓ 1. Use FDA-approved products and only mix enough product to administer to affected cattle, which will result in little to no waste product.
- ✓ 2. Follow label and dosing instructions to ensure that the proper dose is administered.
- ✓ 3. Dispose of spent needles and unused pharmaceutical products in a responsible manner. Contact a veterinarian to obtain a puncture-proof container that is labeled "Biohazard". Dispose of spent needles in accordance with EPA guidelines and follow local solid waste regulations.

References:

- (1) Best Management Practices for Agrichemical Handling and Farm Equipment Maintenance, FDACS and FDEP. <http://www.floridaagwaterpolicy.com/BestManagementPractices.html>
- (2) Integrated Pest Management Program at the University of Florida. <http://ipm.ifas.ufl.edu/>
- (3) Use Management Practices to Protect Groundwater from Agricultural Pesticides, UF-IFAS, PI 1. <http://edis.ifas.ufl.edu/PI001>
- (4) Arsenic Contamination from Cattle-Dipping Vats, UF-IFAS, SL152. <http://edis.ifas.ufl.edu/SS205>
- (5) Management Practices to Protect Surface Water from Agricultural Pesticides, UF-IFAS, PI 22. <http://edis.ifas.ufl.edu/PI014>
- (6) Florida Cow-Calf and Stocker Beef Safety and Quality Assurance Handbook: Quality Control Points, UF-IFAS, Publication AN173. <http://edis.ifas.ufl.edu/AN173>
- (7) Disposal of Medical Sharps, EPA, www.epa.gov/osw/nonhaz/industrial/medical/disposal.htm

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APPENDIX 1. GENERAL BMP REFERENCES

The documents listed below are very good sources of information for producers to consult on agricultural and environmental issues.

General BMP References

- (1) *National Management Measures for the Control of Nonpoint Pollution from Agriculture*, U.S. Environmental Protection Agency, July 2003.

This manual provides guidance to States and the public regarding management measures that may be used to reduce nonpoint source pollution from agricultural activities. Chapter 4 deals with animal feeding operations and grazing management.

<http://www.epa.gov/nps/agmm/>

- (2) *Best Management Practices for Agrichemical and Farm Equipment Maintenance*, Florida Department of Agriculture and Consumer Services, Florida Department of Environmental Protection, February 2000.

This manual lists responsible handling and use of pest control products, and pollution prevention actions that can be implemented at farm maintenance areas that protect the environment.

<http://www.floridaagwaterpolicy.com/BestManagementPractices.html>

- (3) *Protecting Louisiana's Waters Using Best Management Practices*, Louisiana State University Agricultural Center, 2001.

This publication includes information on five main areas: nutrient management, pesticide management, soil and water management, pasture management and general farm BMPs.

<http://www.lsuagcenter.com/en/environment/conservation/bmps/Protecting+Louisianas+Waters+Using+Best+Management+Practices.htm>

- (4) *Protecting Florida's Springs: Land Use Planning Strategies and Best Management Practices*, Florida Department of Community Affairs and Florida Department of Environmental Protection, November 2002.

This guide provides an introduction on the hydrologic importance of springs, comprehensive planning strategies, other information to manage development impacts, and specific criteria for other industries.

<http://www.dca.state.fl.us/fdcp/DCP/publications>

- (5) *Beneficial Management Practices: Environmental Manual for Alberta Cow/Calf Producers*, Alberta Agriculture, Food and Rural Development, June 2004.

This manual was developed to inform and educate producers on beneficial management practices that can enhance soil, water, air and biodiversity. These BMPs protect the environment while keeping production practical and within the law.

[http://www1.agric.gov.ab.ca/\\$Department/dept-docs.nsf/all/epw8724](http://www1.agric.gov.ab.ca/$Department/dept-docs.nsf/all/epw8724)

University of Florida – Institute of Food and Agricultural Sciences References

- Standardized Fertilization Recommendations for Agronomic Crops*, UF-IFAS, Fact Sheet SL-129

This publication presents in abbreviated form the fertilization recommendations for agronomic crops based on soil tests performed by the UF/IFAS Extension Soil Testing Laboratory (ESTL). It contains the basic information from which ESTL soil-test reports and fertilization recommendations are generated.

<http://edis.ifas.ufl.edu/SS163>

- Integrated Pest Management Strategies*, UF-IFAS, Circular 1149

This circular describes the principles of integrated pest management (IPM) and advises strategies for implementation.

<http://edis.ifas.ufl.edu/LH080>

- Florida Crop/Pest Management Profile: Beef Cattle*, UF-IFAS, Circular 1259

This circular gives an overview of Florida's beef cattle industry and contains good information about pest control practices.

<http://edis.ifas.ufl.edu/PI043>

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USDA – Natural Resources Conservation Service References

All references below accessed at:
<http://www.nrcs.usda.gov/technical/efotg>

- (1) Conservation Practice Standard No. 314
(Brush Management)
- (2) Conservation Practice Standard No. 338
(Prescribed Burning)
- (3) Conservation Practice Standard No. 342
(Critical Area Planting)
- (4) Conservation Practice Standard No. 382
(Fence)
- (5) Conservation Practice Standard No. 393
(Filter Strip)
- (6) Conservation Practice Standard No. 412
(Grassed Waterway)
- (7) Conservation Practice Standard No. 472
(Use Exclusion)
- (8) Conservation Practice Standard No. 528
(Prescribed Grazing)

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APPENDIX 2. SETBACKS TABLE

Reference Table for Recommended Setbacks			
BMP #	Practice	Setback (Feet)	Hydrologic Feature Type
1.1.5	Fertilizer spreading	50	Wetlands, streams or sinkholes
1.3.3	Supplemental feeding and mineral stations	100	Watercourses, streams, wetlands, wells or sinkholes
2.2.1	Watering ponds	50*	Wetlands
2.3.3	Piped withdrawal of watercourses	100	Waterbody
8.1.1	New cowpens	200	Watercourses, streams, wetlands, wells or sinkholes
10.1.4	Livestock exclusion	75	Wellhead (potable wells)
11.1.3	Vegetative buffer	25	Wetlands
11.3.1	Vegetative buffer	100	Springs, spring runs, and wet sinks

* Check with the water management district to see if a greater setback is required.

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APPENDIX 3. CONTACT INFORMATION

EMERGENCY INFORMATION

Emergency Reporting Numbers

State Warning Point

Division of Emergency Management -
contact in case of oil or hazardous substance spill

24 hours/
Toll-Free

1-800-320-0519

Emergency Information and Follow-Up Numbers

State Emergency Response Commission

For follow-up reporting only.

For an emergency, call the State Warning Point.

Toll-Free

1-800-635-7179

State Warning Point Information Line

Monday - Friday,
8:00 AM - 5:00 PM

(850) 413-9900

DEP Emergency Response

Monday - Friday,
8:00 AM - 5:00 PM

(850) 245-2010

NON-EMERGENCY INFORMATION

Florida State Agency Numbers

Toll Free

Department of Agriculture and Consumer Services

Office of Agricultural Water Policy

(850) 617-1727

Division of Agricultural and Environmental Services

(850) 488-3731

Bureau of Pesticides

(850) 487-0532

Bureau of Compliance Monitoring

(850) 488-8731

Division of Animal Industry

(850) 410-0900

Department of Environmental Protection

Nonpoint Source Management Section

(850) 245-7508

Hazardous Waste Management Section

(850) 245-8707

Northwest District Office (Pensacola)

(850) 595-8300

Northeast District Office (Jacksonville)

(904) 807-3300

Central District Office (Orlando)

(407) 894-7555

Southeast District Office (West Palm)

(561) 681-6600

Southwest District Office (Tampa)

(813) 632-7600

South District Office (Ft. Myers)

(941) 332-6975

Water Management Districts

Northwest Florida (Tallahassee)

(850) 539-5999

Suwannee River (Live Oak)

(386) 362-1001

1-800-226-1066

St. John's River (Palatka)

(904) 329-4500

1-800-451-7106

Southwest Florida (Brooksville)

(352) 796-7211

1-800-423-1476

South Florida (West Palm)

(561) 686-8800

1-800-432-2045

Other Helpful Numbers - Main offices, call to obtain local contact information

USDA-NRCS - Florida Main Office (Gainesville)

(352) 338-9500

UF/IFAS Extension Administration

(352) 392-1761

Association of Florida Conservation Districts

(407) 321-8212

Soil and Water Conservation Districts

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APPENDIX 4. ACRONYM LIST AND GLOSSARY

Adsorbed – Adhesion to a surface in a thin layer.

Animal Unit (AU) – Considered to be one mature cow of approximate 1000 pounds, either dry or with calf up to 6 months of age, or their equivalent, based on a standardized amount of forage consumed.

Aquifers – Soil or rock formations that contains ground water and serves as a source of water that can be pumped to the surface.

Artesian Well – A well from which water is forced out naturally under pressure. Artesian wells are bored where water in a layer of porous rock is sandwiched between two layers of impervious rock. Water flows up to the surface because distant parts of the aquifer are higher than the well-head.

Attenuate – To weaken or reduce in force, intensity, effect, quantity, or value.

Best Management Practice (BMP) – A practice or combination of practices determined by the coordinating agencies, based on research, field-testing, and expert review, to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality in agricultural and urban discharges. Best management practices for agricultural discharges shall reflect a balance between water quality improvements and agricultural productivity.

BMAP – Basin Management Action Plan.

BOD – Biochemical Oxygen Demand.

C:N – Carbon to Nitrogen ratio.

Continuous Grazing – The grazing of a specific unit by livestock throughout the year or for that part of the year during which grazing is feasible.

Conveyance Capacity – The amount of flow (generally expressed in cubic feet per second) that a canal/ditch can carry based on the size, shape, slope, and condition of the canal/ditch.

Cowpens – Fenced structure used to temporarily confine cattle for examination, medication, vaccination, administering parasite control, weighing, sorting, and /or identification. Confinement is commonly less than 12 hours, but occasionally cattle may be retained for up to one week. Pens are denuded of vegetation if heavily used, but contain vegetation when lightly used.

C-139 Basin – A SFWMD regulatory sub-basin wholly contained within Hendry County.

EAA – Everglades Agricultural Area

EDIS – Electronic Document Information System.

EPA – Environmental Protection Agency.

ERP – Environmental Resource Permit.

Eutrophication – A process whereby watercourse, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant growth.

Evapotranspiration (ET) – The water lost to the atmosphere by evaporation and transpiration. Evaporation is the loss from open bodies of water and transpiration is the loss from living-plant surfaces.

FCWA – Federal Clean Water Act.

FDACS – Florida Department of Agriculture and Consumer Services.

FDEP – Florida Department of Environmental Protection.

FDOH – Florida Department of Health.

Flash-Grazing – The concept of grazing a normally excluded area with a large number of cattle for a short period of time, generally not exceeding three days.

FOTG – Field Office Technical Guide.

F.S. – Florida Statutes.

FWRA – Florida Watershed Restoration Act.

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Gully Erosion – The erosion process whereby water accumulates in narrow channels and, over a short period time, removes the soil from this narrow area to considerable depths, ranging from one to two feet deep.

Hydraulic Drawdown – The amount by which the water level in an aquifer or water table is further lowered, when the water from that aquifer or water table is continually removed by man-made means (pumps, canals/ditches).

IPM – Integrated Pest Management.

MSSW – Management and Storage of Surface Waters.

N – Nitrogen.

NOI – Notice of Intent.

Normal Pool – A water level elevation based on consideration of biological indicators of sustained inundation, using reasonable scientific judgment used to standardize measurements of water levels and facilitate comparison among wetlands.

P – Phosphorus.

Paddocks – A subdivision of a pasture designed to provide short-duration grazing followed by an appropriate (related to species, soil type and weather conditions) rest period for regrowth and stand maintenance.

Perennial Streams – Streams or rivers that flow in a well-defined channel throughout most of the year under typical climatic conditions.

PPM – Parts per Million.

Prescribed Grazing – The controlled harvest of vegetation with grazing or browsing animals managed with the intent to achieve a planned objective(s).

Resource Management System-Level

Conservation Plan – is a record of the decisions and supporting information for treatment of a unit of land or water consistent with the NRCS Field Office Technical Guide (FOTG) quality criteria for soil, water, air, plants, and animals, and takes into account economic and social considerations. The plan must be consistent with the NRCS National Planning Procedures Handbook, as amended, be approved by NRCS or an authorized technical service provider, and specify the schedule of operations and activities needed to address identified natural resource issues. For purposes of this definition, the plan must be updated at least every five years.

Rill Erosion – An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently cultivated fields, cuts and fills and canal banks. Rills are smaller than gullies and can be driven across.

Rinsate – The solution remaining after rinsing something.

Riparian – Vegetated ecosystems along a watercourse through which energy, materials, and water pass. Riparian areas characteristically have a high water table and are subject to periodic flooding and influence from the adjacent watercourse.

Rip-rap – Large, loose angular stones that serve as a permanent erosion-resistant ground cover.

Rotational Grazing – Rotational grazing is the grazing of two or more subdivisions of pasture in sequence, followed by a rest period for recovery and re-growth.

Septage – A mixture of sludge, fatty materials, human feces, and wastewater removed during the pumping of an onsite sewage treatment and disposal system.

Sorbed – The action of a substance which is either adsorbed or absorbed onto another substance.

Spoil – The soil material obtained from excavating an area to construct such works as canals/ditches and/or ponds. This material is typically used to build berms and/or dikes along or in the vicinity of the excavation site.

Supplemental Feeding – Supplying feed to range

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animals when available forage is too limited to meet their minimum daily requirement.

SWCD – Soil and Water Conservation District.

TMDL – Total Maximum Daily Load.

Treatment Train – A combination of nonstructural and structural practices which have been determined to be effective for reducing or preventing pollution.

Turbid – In relation to water, it is described by having an opaque and cloudy appearance and containing suspended solids or other pollutants that may limit light penetration.

Turnout – The extension of a road ditch into a vegetated area to provide for the dispersion and filtration of stormwater runoff.

UF-IFAS – University of Florida, Institute of Food and Agricultural Sciences.

USDA-NRCS – United States Department of Agriculture, Natural Resources Conservation Service.

USGS – United States Geological Survey.

Water Control Structures – Any structure used to regulate surface or subsurface water levels.

Watercourse(s) – Any natural or man-made (ditch or canal) water feature that flows continuously or intermittently. For the purposes of this manual, watercourses do not include wetlands as part of their definition.

Watersheds – Described as drainage basins or regions of land where surface water drains downhill into a specified body of water.

Waters of the State – Defined in section

403.031(13), Florida Statutes, to include, but not limited to, rivers, lakes, streams, springs, impoundments, wetlands, and all other waters or bodies of water, including fresh, brackish, saline, tidal, surface, or underground waters. Waters owned entirely by one person other than the state are included only in regard to possible discharge on other property or water. Underground waters include, but are not limited to, all underground waters passing through pores of rock or soils or flowing through in channels, whether manmade or natural. Solely for purposes of s. 403.0885, waters of the state also include navigable waters or waters of the contiguous zone as used in s. 502 of the Clean Water Act, as amended, 33 U.S.C. ss. 1251 et seq., as in existence on January 1, 1993, except for those navigable waters seaward of the boundaries of the state set forth in s. 1, Art. II of the State Constitution.

Wetlands – As defined in section 373.019(25), Florida Statutes, wetlands means those areas that are inundated or saturated by surface water or groundwater at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological, or reproductive adaptations, have the ability to grow, reproduce, or persist in aquatic environments or anaerobic soil conditions. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas. Florida wetlands generally do not include longleaf or slash pine flatwoods with an understory dominated by saw palmetto.

WMD – Water Management District.

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APPENDIX 5. NUTRIENT BUDGET WORKSHEET

Land User:	County:	Date:
Prepared By:	Field #(s):	

Table 1 - Field Conditions and Recommendations

Crop sequence/rotation (circle current crop)			Expected yield
Current soil test levels (ppm)			
P	K	pH	
Recommended nutrients/amendments to meet expected yield			
N	P ₂ O ₅	K ₂ O	Lime

Table 2 - Nutrient Sources

Credits	Pounds per acre		
	N	P ₂ O ₅	K ₂ O
1. Nitrogen credits from previous legume crop			
2. Residual from long-term manure application			
3. Irrigation water			
4. Other (e.g., atmospheric deposition)			
5. Total credits			
Plant available nutrients applied to field	N	P ₂ O ₅	K ₂ O
6. Credits (from row 5, above)			
7. Fertilizer			
8. Manure/organic material			
9. Subtotal (sum of lines 6, 7, and 8)			
10. Nutrients recommended (from table 1)			
11. Nutrient status (subtract line 10 from line 9)			
If line 11 is a negative number, this is the amount of additional nutrients needed to meet the crop recommendation.			
If line 11 is a positive number, this is the amount by which the available nutrients exceed the crop requirements.			

Nutrient Management Specifications			
Amount to be applied (lb/ac)	N	P ₂ O ₅	K ₂ O
Method, form, and timing of application:			

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Instructions to Complete the Nutrient Budget Worksheet

1. Table 1 – Field Conditions and Recommendations

- Enter the crop rotation and circle the current crop (Ex: Bermudagrass, hay or bahiagrass, grazed).
- Enter expected yield (Ex: 5 tons/ac if the crop was bermudagrass, hay or 20 animal unit month (AUM) if the crop was bahiagrass, grazed).
- Enter current soil test levels (ppm). These test levels should be from a Mehlich 1 test, which is what the UF/IFAS soil testing lab uses. A current soil test for phosphorus application should be one that is no more than 1 year old. If applying nutrients at maintenance levels on pasture and hayland, then a soil test should be no older than 5 years.
- Enter recommended nutrients/amendments to meet expected yield. If applying commercial fertilizers the recommendations will come from the UF/IFAS Circular SL-129 – Standardized Fertilization Recommendations for Agronomic Crops dated June 2007. If applying manures or organic by-products (i.e., municipal or sewage sludge), the recommendations will come from crop uptake rates from UF/IFAS research or from book values in the USDA-NRCS Agricultural Waste Management Handbook, Chapter 6. The lime value will come from the soil test results sheet.

2. Table 2 – Nutrient Sources

- Line 1 – Enter credits from previous legume crop. This credit is the amount of estimated nitrogen in pounds per acres that a legume (i.e., clovers, perennial peanut, soybeans) will add to the soil, so the preceding crop can use it. Amounts of nitrogen can be obtained from UF/IFAS research publications such as: Nitrogen Fixation and Inoculation of Forage Legumes, SS-AGR-56.
- Line 2 – Enter residual from long-term manure application. This credit is the amount of nitrogen in pounds per acre from manure application. The amount of nitrogen that becomes available depends on the rate of mineralization or decay and this decay depends on the type of manure and the length of time that it is on the field. For example fresh cow manure that is incorporated into the soil daily has a decay rate of 0.75; 0.15; 0.10; 0.05. This means that 75 percent of the

incorporated nitrogen becomes available the first year, 15 percent of the remaining nitrogen becomes available in the second year, 10 percent of the remainder in the third year, and so on. So, with enough time 100 percent will become available for the plant to use. Book values for the mineralization can be found in the NRCS Agricultural Waste Management Handbook, Chapter 11 or from UF/IFAS research.

- Line 3 – Enter nutrient amounts from irrigation water. The irrigation water will need to be tested to determine what nutrient levels are present.
- Line 4 – Enter other credits. These can come from items such as atmospheric deposition, which only accounts for about 3 lbs of N, .35 lbs of P_2O_5 , and .48 lbs of K_2O .
- Line 7 – Enter the nutrient amounts for commercial fertilizer.
- Line 8 – Enter the nutrient amounts for manure/organic material. These amounts will come from the analysis of the manure or organic material.
- Line 9 – Enter the sum of the credits, commercial fertilizer, and the manure/organic material.
- Line 10 – Enter the nutrients that were recommended to meet the expected yield from Table 1.
- Line 11 – Subtract the nutrients recommended from the sum of the credits, fertilizer, and manure. If this number is negative then additional nutrients need to be applied to meet the crop recommendation. If this number is positive then the available nutrients exceed the crop requirements and adjustments need to be made to limit overloading of nutrients.

3. Nutrient Management Specifications

- Enter the amount of the nutrients to be applied, which will come from the calculations in Table 2.
- Enter a description of the application method (i.e., broadcast with a spreader, applied through an irrigation system), form of the fertilizer (i.e. liquid, granular, or manure), and the timing of the application (i.e. date of application, growth stage of the crop).

(Adapted from USDA-NRCS literature)

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EXAMPLE (BAHIAGRASS) WORKSHEET

Land User:	County:	Date:
Prepared By:	Field #(s):	

Table 1 – Field Conditions and Recommendations

Crop sequence/rotation (circle current crop)			Expected yield
Bahia grass, graze			100 AUM
Current soil test levels (ppm)			
P	K	pH	
20 ppm	30 ppm	5.5	
Recommended nutrients/amendments to meet expected yield			
N	P ₂ O ₅	K ₂ O	Lime
50 (Low - N option)	0	0	0

Table 2 – Nutrient Sources

Credits	Pounds per acre		
	N	P ₂ O ₅	K ₂ O
1. Nitrogen credits from previous legume crop	0		
2. Residual from long-term manure application	0		
3. Irrigation water	0	0	0
4. Other (e.g., atmospheric deposition)	0	0	0
5. Total credits	0	0	0
Plant available nutrients applied to field			
	N	P ₂ O ₅	K ₂ O
6. Credits (from row 5, above)	0	0	0
7. Fertilizer	50	0	0
8. Manure/organic material	0	0	0
9. Subtotal (sum of lines 6, 7, and 8)	50	0	0
10. Nutrients recommended (from table 1)	50	0	0
11. Nutrient status (subtract line 10 from line 9)	0	0	0
If line 11 is a negative number, this is the amount of additional nutrients needed to meet the crop recommendation.			
If line 11 is a positive number, this is the amount by which the available nutrients exceed the crop requirements.			

Nutrient Management Specifications						
Amount to be applied (lb/ac):	N	50	P ₂ O ₅	0	K ₂ O	0
Method, form, and timing of application: Broadcast 147 lbs/ac of ammonium nitrate (34-0-0) granules.						
Apply in the early spring and incorporate into the soil immediately after application.						

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APPENDIX 6. SOIL AND TISSUE TESTING INFORMATION

Soil Testing

The soil testing process comprises four major steps, and understanding each one clearly will increase the reliability of the process tremendously. The steps in the soil testing process are:

- soil sampling
- sample analysis
- interpretation of test results
- nutrient recommendations

Soil Sampling: Soil samples need to be representative of the field and soil types and the soil analysis results will be only as good as the submitted sample is. Samples collected from areas that differ from typical characteristics of the farm should be submitted separately and should not be consolidated with the primary samples. Using a management zone (area on the farm that is managed similarly) as a guiding factor to collect and consolidate samples is strongly recommended to optimize resources. Consult the IFAS Extension Fact Sheet SL181 for further information on soil sampling strategies. Ranchers can use the soil test sheet on page 71 when they have bahia grass in a phosphorus. For other forages and bahia grass in areas that are not phosphorus-limited, use the soil test sheet which can be found at: <http://edis.ifas.ufl.edu/pdf/SS/SS18600.pdf>.

Sample Analysis: The soil samples that are submitted to the testing laboratories undergo a series of physical and chemical processes that are specific to the soil types, crops, and management regimes. Once the soil samples are homogenized through grinding and/or sieving, a precise volume of the sample will be extracted for plant nutrient through an extraction procedure. The following standard methods are approved by the IFAS Soil Testing Laboratories for different soils in Florida:

- a) Mehlich-1 extraction - this method is performed on all acid-mineral soils up to a soil pH of 7.3.
- b) AB-DTPA extraction - this method is performed on alkaline (calcareous) soils with a pH of 7.4 and above.
- c) Water extraction - this method is used for extraction of P in all organic soils.
- d) Acetic acid extraction - this method is performed on all organic soils for extraction of K, Mg, Ca, Si, and Na.

It is extremely important that procedures used at the laboratories are well understood before sub-

mitting the samples since most BMPs are tied to the standardized procedures used by the labs at the land-grant universities in the state such as UF/IFAS. Similarly, it is also very important to note that the IFAS laboratory does not offer any test for N since there is no reliable test for plant available N under Florida conditions. N recommendations are based on crop nutrient requirements found in the research literature. More information regarding the procedures used at the IFAS Extension Soil Testing Laboratory in Gainesville can be found in the extension publication, Circular 1248.

Interpretation of Test Results: The primary goal of state laboratories in offering the soil testing service is to provide interpretation of the soil test results based on soil test-crop response trials and field calibration of the test results with the optimum economic yields of the various plant species. Economic yield increases resulting from added nutrients cannot be obtained once the test results are interpreted as 'High' resulting in no recommendation for that particular nutrient. The interpretations provided are specific to the soil and plant species.

Current interpretation tables can be obtained from SL 189 - IFAS extension fact sheet.

Tissue Testing

Tissue testing is the analysis and diagnosis of the plant's nutritional status based on its chemical composition. It is commonly performed as analyses on dried blades, leaves or dried petioles or on sap from fresh petioles, with results compared to recommended nutrient ranges.

Efficient fertilizer management is important to reduce costs, conserve natural resources, and to minimize potential impacts on the environment. These goals can be achieved through optimum management of the fertilizer component. Timely tissue testing is an important tool used in fertilizer management through monitoring the plant's nutritional status, and such testing is also used in diagnosing suspected problems like nutritional deficiency, toxicity or imbalance. As a management tool, tissue testing can increase a rancher's return by preventing deficiencies that can reduce yield(s), market quality, and profitability.

Methodology: Begin sampling soon after the crop is established and continue at regular intervals (weekly or biweekly). Individual plants, even side-by-side, may have different nutritional status.

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Therefore, by sampling a sufficiently large number of plants, the effect of this error due to inherent variability should be minimized. It is preferable to include a soil sample together with a tissue sample when submitting samples to a diagnostic lab, since the soil sample may indicate other factors - such as pH - that may influence crop growth, nutrient availability, and uptake. Avoid plant tissue testing if the field has received foliar nutrient sprays containing micronutrients or nutrient-containing pesticides. Also, avoid sampling plants damaged by pests, diseases, or other chemicals when trying to monitor the nutritional status of the sod.

Whole-leaf sampling will be most useful early in the season, while later in the season, it can help to point to changes in fertilization practices that are needed for the next season. Fresh petiole sap testing for N and K, practiced regularly throughout the season, can help manage the current crop as well as provide guidance for the next crop. Sample a recently matured leaf blade. Collect enough leaf material so that the sample is representative of the crop stand, and that the sample is large enough to perform the required analyses.

If a deficiency is suspected, collect one composite sample from the area exhibiting the disorder and a second sample from an otherwise "normal" section for comparison when trying to diagnose a nutrient deficiency. Separate and properly label the "disorder" sample and the "normal" sample in order to make a valid comparison after analyses. Keep notes on condition of the sod and stage of growth, weather, and other variables for future reference.

Be careful not to crush or damage samples during cleansing. Avoid using tap water to rinse blade samples, since it can be high in nutrients such as calcium, iron, magnesium, or sulfate sulfur. Use distilled water instead. In most situations, cleansing

is not needed. Blot the samples dry with absorbent paper after rinsing, and air-dry the samples several hours before shipment. Wrap the samples in absorbent paper and place them in a large envelope if a plant analysis kit is not available, and mail immediately.

Select a reputable laboratory that provides interpretations and recommendations based upon test results appropriate for your growing region. Interpretation guidelines should be based on actual field research, not on "typically observed" or historical lab databases. The laboratory should be reliable and certified and also offer a routine turnaround of less than 48 hours.

For more information please see SL 131, Plant Tissue Information Sheet, Soil and Water Science Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Last revised July 2005. <http://edis.ifas.ufl.edu/SS182>.

References:

- Sartain, J.B. 2001. Soil Testing and Interpretation for Florida Turfgrasses. SL181. Soil and Water Science, Cooperative Extension Service, IFAS, p. 2. <http://edis.ifas.ufl.edu/SS317>.
- Mylavarapu, R.S. and E.D. Kennelley. 2002. UF/IFAS Extension Soil Testing Laboratory Analytical Procedures and Training Manual. Soil and Water Science, Circular 1248, Cooperative Extension Service, IFAS, <http://edis.ifas.ufl.edu/SS312>.
- Mylavarapu, R.S. 2002. The Process of Standardized Nutrient Recommendation Development for Successful Crop Production and Environmental Protection. SL 189, Soil and Water Science, Cooperative Extension Service, IFAS. <http://edis.ifas.ufl.edu/SS401>.

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IFAS Analytical Services Laboratories Extension Soil Testing Laboratory

PO Box 110740 / Wallace Building 631, UF / Gainesville, FL 32611-0740
EMAIL: SOILSLAB@IFAS.UFL.EDU WEBSITE: SOILSLAB.IFAS.UFL.EDU

Producer Bahia Test Information Sheet

Note: This Lab only tests samples from the State of Florida.

Mailing Address (please print)

Name _____ Phone _____

Address _____

City _____ FL Zip _____

Date _____ E-Mail * _____

- This form can be downloaded from our website.
- Detailed information on this test can be obtained from SL129 accessed at edis.ifas.ufl.edu
- For further information contact your local county Extension Agent

* In order to expedite reporting of results, please provide an e-mail address if possible.

Fill in all requested information, using one line per sample and additional sheets for more than 5 samples.

Lab Use only	County	Test(s) Requested (see Page 2 or back)	Acreage	Sample ID For Soil	Sample ID For Leaf Tissue	Cost

Check _____ Money Order _____ Cash _____ Total _____

Important Information for Soil Sample Collection and Submission

Before Sampling:

1. Develop a soil sampling plan of your field. Samples should represent the area being tested, so collect samples from areas that are of the same soil type, appearance, or cropping history. Sample problem areas separately, if needed. From this plan, count the number of samples you will collect.
2. Soil sample bags, addressed shipping boxes, and information sheets are available free from your county Cooperative Extension office. Obtain the materials you need to complete your sampling plan.

Collecting Samples:

1. Collect soil from 20 or more spots within each area, mixing these samples in a clean plastic bucket.
2. Sample from soil surface to depth of tillage, usually 0 to 6 inches. For pastures, sample from 0 to 4 inch depth.
3. Spread the composited material on clean paper or other suitable material to air dry. Do not send wet samples.
4. Mix the dry soil, and place about one pint of soil in a labeled sample bag.

Sending samples to the Extension Soil Testing Laboratory:

1. Enter each sample's identification on its sample bag and in the Soil Sample Identification column. List each sample separately.
2. Lime and fertilizer recommendations are provided only if the crop code(s) is listed.
3. Include the analysis code for each desired test.
4. Enter costs from the Analysis Cost list found on page 2 of this form.
5. Sum the costs of all samples and analyses. Make check or money order payable to: **University of Florida**.
6. Include the completed Producer Bahia Test Information Sheet and the check or money order in the shipping box with the sample(s).

Test results:

A soil test report will be emailed / mailed to you within 5 to 10 days after your sample arrives at the Extension Soil Testing Laboratory. Contact your county Extension office if you have questions concerning the Bahia Test Report.

Revised February 2009

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How To Take, Prepare, and Submit Plant Tissue Samples (for Analysis B1)

1. Ensure that each sample contains at least a generous handful of plant material (around half a gallon).
2. Do not sample leaves contaminated with soil or sprays. If all tissue is dusty or spray contaminated, wash leaves gently with flowing distilled water.
3. Do not sample disease-, insect-, or mechanically damaged plant tissue.
4. Place tissue samples directly into a clean paper or cloth bag or envelope. Do not use plastic containers. If the plant tissue is wet or succulent, allow plant material to air dry for at least one day, before mailing.
5. When sampling suspected nutrient-deficient plants, two samples are recommended; one sample from normal plants, and another sample from abnormal plants.
6. When sampling, the plant part and plant maturity are important factors. Be sure to collect the proper plant part at the recommended time. A general rule of thumb is to sample the youngest, fully mature leaves during the growth cycle, or just prior to fruit set.
7. Please do not provide any roots along with the sample.

Important Information

There are three types of tests available for Bahiagrass pastures in Florida (see Table below for details)

Phosphorus Testing and Recommendation for Bahiagrass

- Soil tests alone are not adequate for determining P fertilization needs of Bahiagrass.
- A tissue and soil test must be submitted together to determine P fertilization needs.
- Phosphorus should not be applied if tissue P is at or above 0.15% even if soil tests Very Low or Low for P.
- If P recommendations are not desired and the producer only is interested in K, Mg, Ca levels and pH then a Standard Producer Soil Test will apply. This WILL NOT include P fertilizer recommendations.

Analysis Test Code	Analysis Name	Determinations Made	Analysis Cost
B1	Standard Soil and Tissue Test	pH, lime requirement, P, K, Ca, Mg	\$15.00
1	Standard Soil Test	pH, lime requirement, K, Ca, Mg and P test value only	\$7.00
2	pH and Lime Requirement	pH and lime requirement	\$3.00
3	Micronutrient Test	Cu, Mn, Zn	\$5.00

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APPENDIX 7. INCENTIVE PROGRAMS FOR QUALIFYING FARMS

The implementation of Best Management Practices can reduce non-point sources of pollution, conserve valuable soil and water resources, and improve water quality. The implementation of these management practices can also be expensive and, in some cases, may not be economically feasible for agricultural producers. To reduce the financial burden associated with the implementation of selected practices, several voluntary cost-share programs have been established. These programs are designed to conserve soil and water resources and improve water quality in receiving watercourses. The narrative below is intended to provide basic information regarding the primary federal, state, and regional cost-share programs. Sources of additional information have also been included, and ranchers are encouraged to contact the identified agencies or organizations for current information about each program.

I. Programs Administered by USDA - Farm Services Agency (FSA):

Conservation Reserve Program (CRP): This program encourages farmers to convert highly erodible cropland or other environmentally sensitive lands to vegetative cover including grasses and/or trees. This land use conversion is designed to improve sediment control and provide additional wildlife habitat. Program participants receive annual rental payments for the term of the contract in addition to cost share payments for the establishment of vegetative cover. CRP generally applies to highly erodible lands and is more applicable to North Florida.

Conservation Reserve Enhancement Program (CREP): CREP uses a combination of federal and state resources to address agricultural resource problems in specific geographic regions. This program (which is not limited to highly erodible lands) is designed to improve water quality, minimize erosion, and improve wildlife habitat in geographic regions that have been adversely impacted by agricultural activities.

Emergency Conservation Program (ECP): The ECP provides financial assistance to farmers and ranchers for the restoration of farmlands on which normal farming operations have been impeded by natural disasters. More specifically, ECP funds are available for restoring permanent fences, terraces,

diversions, irrigation systems, and other conservation installations. The program also provides funds for emergency water conservation measures during periods of severe drought.

For further information on CRP and CREP, including eligibility criteria, please contact your local USDA Service Center. Information is also available on the Internet at www.fsa.usda.gov.

II. Programs Administered by USDA - NRCS:

Environmental Quality Incentives Program (EQIP): EQIP provides financial assistance for the implementation of selected management practices. Eligibility for the program requires that the farm have a USDA-NRCS approved Conservation Plan. Practices eligible for EQIP cost share are designed to improve and maintain the health of natural resources and include cross-fences, water control structures, brush management, prescribed burning, prescribed grazing, nutrient management and other erosion control measures.

Conservation Security Program (CSP): CSP is a voluntary conservation program that supports ongoing stewardship on private lands. It rewards farmers and ranchers who are meeting the highest standards of conservation and environmental management. Its mission is to promote the conservation and improvement of soil, water, air, energy, plant and animal life.

Wetlands Reserve Program (WRP): WRP is a voluntary program designed to restore wetlands. Program participants can establish easements (30-year or perpetual) or enter into restoration cost-share agreements. In exchange for establishing a permanent easement, the landowner usually receives payment up to the agricultural value of the land and 100 percent of the wetland restoration cost. Under the 30-year easement, land and restoration payments are generally reduced to 75 percent of the perpetual easement amounts. In exchange for the payments received, landowners agree to land use limitations and agree to provide wetland restoration and protection.

Wildlife Habitat Incentives Program (WHIP): The Wildlife Habitat Incentives Program provides financial incentives for the development of fish and wildlife habitat on private lands. Program eligibility requires that landowners develop and implement

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a Wildlife Habitat Development Plan. Participants enter multiyear (5 to 10 year) agreements with USDA-NRCS.

For further information on these programs, including eligibility criteria, please contact your local USDA Service Center. Information is also available on the Internet at the following web site: www.nrcs.usda.gov

III. Programs Administered by State and Regional Entities:

Soil and Water Conservation Districts: In order to assist agricultural producers in the implementation of BMPs, the Florida Department of Agriculture and Consumer Services has executed a number of cost-share contracts with several of the state's Soil and Water Conservation Districts and Resource Conservation and Development Councils, Inc. Many of these cost-share contractors administer cost-share programs using *Applicant's Handbooks* which include reimbursement rates and rancher selection criteria.

Water Management District Cost Share Memoranda: The Department of Agriculture and Consumer Services has executed Memoranda of Agreement (MOA) with certain Water Management Districts to provide coordination for BMP cost-share programs. Each MOA will identify the primary program areas within the District's geographical boundaries, and designates the agency responsible for program administration.

For further information on these programs, including eligibility criteria, please contact your regional Water Management District, local Soil and Water Conservation District or the Florida Department of Agriculture and Consumer Services. Information and links to other sites are also available on the Internet at the following web site: www.floridaagwaterpolicy.com

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APPENDIX 8. EXAMPLE RECORD KEEPING FORMS

Ranchers are required to keep accurate records to document BMP implementation. Record keeping also aids ranchers in operating and maintaining BMPs, and is required for the following BMP Groups:

- 1.1 **Fertilizer Management** - Maintain records of fertilizer application. Records should include soil test analysis, date of application, fertilizer formulation, application rate, location and acreage, and work-sheet results
- 3.1 **Prescribed Grazing** - Maintain grazing records by pasture, and develop a contingency plan for floods and droughts in order to adjust the required grazing demands.
- 3.2 **Comprehensive Prescribed Grazing** - Keep records on stocking numbers, grazing days, and length of rest periods for each pasture or field.
- 5.2 **Ditch Construction and Maintenance** - Keep records of all ditch maintenance activities, and keep any records that relate to ditch design cross-sectional area.
- 10.2 **Well Construction and Operation** - Maintain records of new well construction or modifications to existing wells. Proper records are important for future reference, in case problems arise with the well.

The tables below correspond to all the record-keeping requirements contained in this manual. They serve as a set of templates to develop your own record-keeping system. You may maintain your records as hard copies or in an electronic format, depending on your preference. You may use these tables, develop your own, or choose commercially available record-keeping software suited to your commodity.

Soil Sample Records				
Date	Field Location	# of Samples	Name of Lab	Records Location

Tissue Sample Records				
Date	Field Location	# of Samples	Name of Lab	Records Location

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Fertilization/Nutrient Records						
Date	Location	Acreage Covered	Type ¹	Formulation ²	Analysis ³	Rate (Lbs/Acre)

Rainfall (in.)											
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.

Well Records					
Location	Year Constructed	Constructed By	Last Modified	Modified By	Records Location

Ditch/Waterway Records				
Location	Design Cross-Section ⁴	Current Cross-Section ¹	Date of Last Cross-Section Inspection	Records Location

Grazing Rotations					
Pasture Location	Pasture Size	Stocking Rate (Head/Acre)	Forage Type	# of Days Grazed	Date Last Grazed

¹ Organic, Inorganic, Chemical

² Granular, Water Soluble, etc.

³ e.g. 10-10-10

⁴ Ditch Invert and side slopes

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APPENDIX 9. EMPLOYEE TRAINING POINTS

Good Housekeeping and Pollution Prevention

- Stress the importance of protecting water quality and the environment, as stewards of the land
- Stress the importance of ranch and facility appearance
- Have a schedule or plan for mowing or grazing grassed waterways and filter strips
- Plan for maintenance activities on access roads
- Have a schedule or plan to remove mineral or feeding areas
- Properly maintain cowpen runoff management areas
- Properly store potential pollutants in a designated area
- Secondary containment for above ground storage tanks (fuel, oil, etc.)
- Discuss proper storage, use and disposal of solvents and degreasers, as well as paints, used oil, anti-freeze and batteries
- Discuss ways to handle potential pollutants to reduce the chance of a spill

Animal Mortality Management

- Movement of dead animals away from waterbodies
- Proper disposal methods for your operation
- Reduction of third party inquiries due to improper management

Nutrient Management and Spreading

- Proper forage tissue and soil analysis (apply only what the plant needs)
- Discuss timing of fertilizer application
- Discuss locations to avoid when spreading fertilizer materials
- Discuss proper storage, loading and calibration of equipment

Proper Operation and Maintenance of Facilities

- Inform employees about filter strips, grassed waterways, and waste storage ponds
- Discuss the preventive maintenance schedule for all control facilities (dams, dike, terraces, diversions, berms)
- Discuss facility inspections
- Discuss proper procedures for reporting and repairing problems with control facilities
- Record rainfall using rain gauges
- Have a measuring device in retention ponds
- Have a wastewater discharge plan

Documentation and Records Retention

- Stress importance of record keeping
- Have a schedule for retaining records
- List activities and events that should be documented

For example:

- Fertilizer rate/location/date
- Irrigation amounts applied and rainfall
- Well construction
- Pesticide spraying
- Hazardous waste disposal
- Ditch maintenance activities
- Grazing days and rest periods

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EMPLOYEE TRAINING RECORD

Date: _____

Topic(s) Discussed: _____

Employee(s): _____

Present Responsibility: _____

Trainer: _____

Signature: _____

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APPENDIX 10. GUIDANCE FOR STORMWATER MANAGEMENT

- Contact your local NRCS District Conservationist to obtain information about the soil types for the proposed location. The District Conservationist can identify soil types that are historically prone to flooding or standing water. Evaluate the storage capacity, size, and elevations of existing ditches, ponds, creeks, rivers, and wetlands, and the size, layout, and elevations of the fields. You should also contact your county or water management district to obtain maps (FEMA, FIRM) or other information related to flooding issues at the proposed or existing location. You can access this information via the web at <http://www.fema.gov/hazard/map/firm.shtm>.
- Determine the maximum storm size for which you want to provide flood protection. The flood control design storm addressed by WMD ERP regulations varies from a 25-year, 24-hour storm to a 100-year, 3-day storm. For example, a 25-year, 24-hour storm produces from 8 to 10 inches of rainfall in a 24-hour period. Generally, the larger the design storm event used, the more extensive the stormwater management system needs to be. Factors that will affect this decision include land availability, the existence of internal natural features such as creeks, rivers, ponds, or wetlands, the potential to flood downstream property owners, and costs.
- Consult with a public or private agricultural engineer to discuss your stormwater management needs and considerations, especially if you are farming on poorly drained lands. Find an engineer qualified to provide an appropriate stormwater runoff analysis for your site.
- Include both nonstructural pollution prevention BMPs and structural BMPs, as needed and feasible to meet desired stormwater management objectives. If structural BMPs are needed, determine what is appropriate for your farm characteristics and stormwater management objectives. Each of the WMD ERP regulations and handbooks include specific design guidelines for various structural stormwater BMPs. The construction of a stormwater management system (e.g., retention or detention pond) may require an ERP or other WMD surface water management permit. Therefore, please check with your water management district before beginning construction of any stormwater management system. Typical structural BMPs include:
 - Retention basins that capture stormwater and allow it to percolate into the soil, evaporate, or transpire. These infiltration BMPs are used in areas with sandy soils and a wet-season water table that is at least two feet beneath the bottom of the retention basin. Special designs are needed in Karst areas or springsheds to minimize movement of pollutants, especially nutrients, into the ground water.
 - Wet detention ponds that capture stormwater, detain it, and slowly release the runoff to downstream waters or stormwater systems. Wet ponds are used in areas with a high water table.
 - Grassed waterways used to convey stormwater to structural BMPs. Grassed waterways also help filter runoff and, in many cases, allow stormwater to infiltrate.
 - Typical nonstructural BMPs include field buffers, riparian buffers, nutrient management, minimizing soil compaction and impervious areas.

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APPENDIX 11

Notice of Intent and BMP Checklist

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ADAM H. PUTNAM
COMMISSIONER

EXHIBIT C

Florida Department of Agriculture and Consumer Services
Office of Agricultural Water Policy

FDACS-OAWP
1203 Governor's Sq. Blvd.
Suite 200
Tallahassee, FL 32301

NOTICE OF INTENT TO IMPLEMENT WATER QUALITY BMPs FOR FLORIDA COW/CALF OPERATIONS (2008)

Rule 5M-11.004, F.A.C.

- Complete all sections of the Notice of Intent (NOI). Each NOI may list only properties that are within the same county and are owned or leased by the same person or entity, and on which applicable BMPs will be identified and implemented under this manual.
- Submit the NOI, along with the BMP Checklist, to the Florida Department of Agriculture and Consumer Services (FDACS), at the address below.
- Keep a copy of the NOI and the BMP checklist in your files as part of your BMP record keeping.

You can visit <http://www.freshfromflorida.com/onestop/forms/01520.pdf> to obtain an electronic version of this Notice of Intent to Implement (NOI) form.

If you would like assistance in completing this NOI form or the BMP Checklist, or with implementing BMPs, contact FDACS staff at (850) 617-1727 or AgBmpHelp@freshfromflorida.com.

Mail this completed form FDACS Office of Agricultural Water Policy
and the BMP Checklist to: 1203 Governor's Square Boulevard, Suite 200
Tallahassee, Florida 32301

Person To Contact		
Name: _____		
Business Relationship to Landowner/Leaseholder: _____		
Mailing Address: _____		
City: _____	State: _____	Zip Code: _____
Telephone: _____	FAX: _____	
Email: _____		

<input type="checkbox"/> Landowner or <input type="checkbox"/> Leaseholder Information (check all that apply) NOTE: If the Landowner/Leaseholder information is the same as the Contact Information listed above, please check: <input type="checkbox"/> Same as above. If not, complete the information below.		
Name: _____		
Mailing Address: _____		
City: _____	State: _____	Zip Code: _____
Telephone: _____	FAX: _____	
Email: _____		

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Complete the following information for the property on which BMPs will be implemented under this NOI. You may list multiple parcels if they are located within the same county and are owned or leased by the same person or entity.

Operation Name: _____

County: _____

Tax Parcel Identification Number(s) from County Property Appraiser

Please submit a copy of your county tax bill(s) for all enrolled property, with owner name, address, and the tax parcel ID number(s) clearly visible. If you cannot provide a copy of the tax bill(s), please write the parcel owner's name and tax parcel ID number(s) below in the format the county uses. Attach a separate sheet if necessary (see form provided).

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

☐ Additional parcels are listed on separate sheet. (check if applicable)

Total # of acres of all parcels listed (as shown property tax records): _____

Total # of acres on which BMPs will be implemented under this NOI: _____

In accordance with section 403.067(7)(c)2, Florida Statutes, I submit the foregoing information and the BMP Checklist as proof of my intent to implement the BMPs applicable to the parcel(s) enrolled under this Notice of Intent.

Print Name: _____

(check all that apply) ☐ Landowner ☐ Leaseholder ☐ Authorized Agent (see below)

*Relationship to Landowner or Leaseholder: _____

Signature: _____ Date: _____

Name of Staff Assisting with NOI: _____

NOTES:

1. You must keep records of BMP implementation, as specified in the BMP manual. All BMP records are subject to inspection.
2. You must notify FDACS if there is a full or partial change in ownership with regard to the parcel(s) enrolled under this NOI.
3. Please remember that it is your responsibility to stay current with future updates of this manual. Visit the following website periodically to check for manual updates: www.floridaagwaterpolicy.com

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Additional Tax Parcel Listings

Operation Name: _____

County: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

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Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

Parcel No.: _____ Parcel Owner: _____

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FLORIDA COW/CALF WATER QUALITY BMP CHECKLIST

Checklist Instructions:

Note: Before you fill out this checklist, follow the section on BMP Enrollment and Implementation, which begins on page 3 of this manual. You must read the BMPs in Sections 1.0 - 13.0 before filling out the checklist, in order to know what the practices entail. The checklist summaries are for identification purposes only.

1. Check "In Use" for each BMP that you are currently practicing and will continue to practice. If you have a Conservation Plan, enter the FOTG code number in the "In Use" column for all currently implemented practices contained in the plan that are covered in the checklist, and place a check mark in the column for currently implemented practices not contained in the plan.
2. For the applicable BMPs you do not implement currently but will implement, enter the month and year you plan to implement them in the "Planned" column. Where relevant, enter the FOTG code number and month/year of planned implementation in the "Planned" column. Schedule BMPs to be implemented as soon as practicable. FDACS rule requires that applicable Level I BMPs in the manual be implemented as soon as practicable, but not later than 18 months after submittal of the Notice of Intent (NOI) to implement. This timeline applies to all practices in a Conservation Plan that are identified under the Level I BMPs in the checklist. If you need additional time to implement the following Level I BMPs, you must justify the time needed in the space provided at the end of the checklist: 2.2 Upland Pond Construction Criteria; 2.3 Other Watering Sources; 5.3 Installation of Water Control Structures; 6.3 Riparian Buffer.
3. If you have a Conservation Plan, make sure you identify in the checklist all applicable BMPs that are in the plan and those that are not in the plan. If the plan contains practices that are not covered in the BMP checklist, list the FOTG code number and the names of those practices in the space provided at the end of the checklist.
4. For BMPs you will not implement, check all of the following that apply under "Will Not Implement":
 - NA = Not Applicable (you do not have a resource concern that requires use of the BMP)
 - TNF = Technically Not Feasible
 - ENF = Economically Not Feasible
 - Other – If you select "Other," please explain your reason in the comments section at the end of the form.
5. Make sure you are aware of and follow the record-keeping requirements. BMP groups that include record keeping are marked by the following pencil icon:
6. Mail this BMP checklist with your NOI form to FDACS, and keep a copy of both documents in your files. If you have developed a Conservation Plan, submit a copy of the plan along with the NOI and checklist.

BMP #	BMP Group (See body of manual for full description)	In Use/CP# Check below/ Enter FOTG #	Planned Enter month/ year	Will not implement (check reason below)			
				NA	TNF	ENF	Other

1.0 Nutrient Management

1.1 Level I - Fertilizer Management

1. Use Mehlich-1 soil test results or equivalent to determine P application rate						
2. Determine supplemental fertilizer needs using appendix 5 worksheet						
3. Use IFAS publication SL-129 to determine fertilization rates						
4. Time fertilizer applications for maximum nutrient uptake						
5. Prevent spreading fertilizer material within 50' of streams, sinkholes, or wetlands						

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BMP #	BMP Group (See body of manual for full description)	In Use/CP#	Planned	Will not implement (check reason below)			
		Check below/Enter FOTG #	Enter month/year	NA	TNF	ENF	Other
1.2. Level I - Residuals or Biosolids Application							
	1. Follow FDEP/FDOH regulations for residuals/septage application						
	2. Request the Calcium Carbonate Equivalency and nutrient analysis of treated biosolids						
	3. Obtain copy of FDEP "Agricultural Use Plan"						
1.3. Level I - Animal Nutrition and Feedstock							
	1. Manage supplemental feed to avoid high nutrient loads						
	2. Locate confined feeding areas away from sensitive features						
	3. Locate mineral and supplemental feed 100' from sensitive features						
1.4. Level I - Animal Waste Management							
	1. Manage livestock distribution to reduce waste accumulation						
	2. Use concentrated on-site manure sources for fertilizer						
2.0 Alternative Cattle Water Sources							
2.1. Level I - Water Needs Inventory							
	1. Inventory existing water sources and compare to livestock demand						
	2. Review water management district records on regional well water quality data						
2.2. Level I - Upland Pond Construction Criteria							
	1. Construct ponds less than 2 acres and locate at least 50' from wetlands, or further based on water management district requirements						
	2. Construct cattle access areas with minimum 3:1 slope						
2.3. Level I - Other Watering Sources							
	1. Locate troughs/shade to keep cattle from streams or watercourses						
	2. Construct troughs/tanks with stable base						
	3. Extend pipe at least 100' from waterbody						
3.0 Prescribed Grazing							
3.1. Level I - Prescribed grazing guidelines							
	1. Manage forages/pastures to promote plant vigor, prevent erosion and maintain soil moisture						
	2. Use rotational grazing or other measures for regrowth						
	3. Manage wetlands through flash grazing or exclusion						
3.2. Level II - Comprehensive Prescribed Grazing							
	1. Develop grazing schedules based on NRCS Code 528						
	2. Incorporate cross-fencing in larger pastures						

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BMP #	BMP Group (See body of manual for full description)	In Use/CP#	Planned	Will not implement (check reason below)			
		Check below/ Enter FOTG #	Enter month/ year	NA	TNE	ENF	Other

4.0 Sediment and Erosion Control Measures

4.1. Level I - General Erosion and Sediment Control Measures

1. Minimize vegetation clearing during construction
2. Clear land during dry season
3. Vegetate road banks and disturbed areas within 14 days of construction
4. Use rock crossings for low flow streams
5. Manage livestock to prevent erosive trails

4.2. Level I - Silt Fences

1. Use silt screens (less than 3 months) for sheet flow

4.3. Level II - Check Dams

1. Install check dams perpendicular to flow

4.4. Level II - Sediment Traps

1. Install sediment traps within conveyance system or near cowpens
2. Retrofit associated sediment trap structures with flashboard risers

4.5. Level III - Grade Stabilization Structures

1. Clear construction area of debris
2. Vegetate disturbed areas within 14 days of construction
3. Fence around structure to exclude livestock
4. Install structures during the dry season
5. Follow criteria for fill placement and spreading per this BMP
6. Prevent damage from overtopping the structure, and divert excess flows
7. Follow earth embankment side slope specifications per this BMP
8. Obtain technical assistance as needed

5.0 Water Resources Management

5.1. Level I - Water Supply

1. Know quantity/quality of irrigation source
2. Determine water requirements for forage grasses

5.2. Level I - Ditch Construction and Maintenance

1. Follow appropriate grades and plans during ditch excavation
2. Use appropriate setbacks to avoid hydraulic drawdown impacts to wetlands
3. Use structural control measures in areas with high water velocity
4. Control broadleaves to maintain permanent vegetative cover
5. Remove unconsolidated sediments from ditches

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BMP #	BMP Group (See body of manual for full description)	In Use/CP#	Planned	Will not implement (check reason below)			
		Check below/Enter FOTG #	Enter month/year	NA	TNF	ENF	Other
5.3. Level I - Installation of Water Control Structures							
	1. If economically feasible, install water control structures to rehydrate wetlands that have offsite flows						
	2. Maintain boards in all structures to reduce discharge volume						
5.4. Level I - Grassed Waterways							
	1. Install grassed waterways per USDA-NRCS specifications						
6.0 Conservation Buffers							
6.1. Level I - Field Borders							
	1. Install and maintain field borders at perimeter on new improved pastures						
	2. Time planting borders for plant survival and consider using native species						
6.2. Level I - Filter Strips							
	1. Install filter strip to treat runoff from concentrated livestock areas						
	2. Follow filter strip construction criteria in this BMP						
6.3. Level I - Riparian Buffers							
	1. Install and maintain riparian buffer if > 1% slope, and follow NRCS criteria						
7.0 Fence Installation							
7.1. Level I - General Fence Installation							
	1. Minimize soil and vegetative disturbances while clearing land						
	2. Select materials based on purpose and site conditions						
	3. Adjust stocking rates or subdivide larger pastures						
	4. Stabilize streambanks and provide alternative water sources in improved pastures, or install exclusion fencing						
	5. Provide riparian buffer in native or semi-improved pastures that runoff to perennial streams						
7.2. Level I - Fence Installation in Wetlands							
	1. Minimize use of mechanical equipment, and limit clearing to 12' on either side of fence						
	2. Perform work during the dry season						
7.3. Level II - Livestock Use Exclusion							
	1. In area regulated by water management district, install exclusion fencing 300' from discharge point						
	2. In area not regulated by water management district, install exclusion fencing 500' from discharge point						
	3. Install exclusion fencing adjacent to perennial streams where significant erosion occurs						

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BMP #	BMP Group (See body of manual for full description)	Use/CP#	Planned	Will not implement (check reason below)			
		Check Below/ Enter FOTG #	Enter month/ year	NA	TNF	ENF	Other
8.0 High-Intensity Areas							
8.1 Level I - High-Intensity Area Management							
	1. Locate new cowpens 200' from sensitive features; use berm						
	2. Direct runoff from high-intensity areas away from sensitive features						
8.2 Level II - Design Retrofits							
	1. Use aggregate materials to prevent erosion						
	2. Treat discharges occurring into sensitive features						
9.0 Animal Mortality							
9.1 Level I - Sanitation and Disease Control Measures							
	1. Transport carcasses in a sanitary manner						
	2. Clean equipment that comes into contact with carcasses						
	3. Report dangerous diseases to the state veterinarian (refer to list in this BMP)						
9.2 Level I - Disposal							
	1. Move carcasses to upland areas						
	2. Locate burial sites at least 200' from sensitive features and 50' from adjacent property						
9.3 Level I - Rendering and Incineration							
	1. Use a licensed rendering/incinerating facility						
10.0 Wellhead Protection for Drinking Water Wells							
10.1 Level I - Well Planning and Protection							
	1. Construct new wells upgradient from likely pollutant sources						
	2. Research well permit requirements						
	3. Cap or valve free-flowing wells						
	4. Keep livestock 75' from potable wells						
10.2 Level I - Well Construction and Operation							
	1. Use a Florida-licensed water well contractor						
	2. Follow pad and casing specifications in this BMP						
	3. Retrofit existing wells with concrete collar and fence						
	4. Use backflow prevention devices at the wellhead						
11.0 Wetlands and Springs Protection							
11.1 Level I - Wetland Protection and Impact Avoidance							
	1. Identify wetland or hydric soil types using soil survey						
	2. Eliminate or reduce adverse impacts to wetlands						
	3. Maintain a 25' vegetative buffer from wetlands, or follow buffers prescribed in your WMD permit						
	4. Obtain a USDA-NRCS wetland determination prior to conducting activities in a wetland						

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BMP #	BMP Group (See body of manual for full description)	In Use/CP#	Planned	Will not implement (check reason below)			
		Check below/ Enter FOTG #	Enter month/ year	NA	TNF	ENF	Other
11.2. Level I - Water Quality Treatment and Field Discharges							
1.	Use pretreatment practices to protect wetlands						
2.	Rotate livestock through wetlands at accelerated pace						
3.	Use spreader swales or other means to encourage sheetflow						
11.3. Level I - Special Criteria for First and Second Magnitude Springs							
1.	Maintain a 100' vegetative buffer around spring features						
2.	Use split applications of fertilizers on pasture areas that discharge to spring features						
12.0 Prescribed Burning							
12.1. Level I - Burn Preparation							
1.	Develop and implement a burn prescription plan, or use a Certified Prescribed Burn Manager						
2.	Obtain burn permit from DOF and heed burning bans						
3.	Use burning in conjunction with roller chopping in areas with an abundance of palmettos						
4.	Burn only when weather conditions are favorable						
12.2. Level I - Construction of Firelines							
1.	Carefully select fireline locations and avoid constructing them in wetlands						
2.	Use alternatives to plowed firelines						
3.	Construct firelines with the contour to minimize soil erosion						
12.3. Level I - Fire Safety and Control							
1.	Have adequate fire equipment and control burn temperature						
2.	Ensure fire is completely out before leaving the site						
13.0 Integrated Pest Management and Pharmaceuticals							
13.1. Level I - General IPM Practices							
1.	Store pesticides in roofed structure with lockable door, at least 100' from surface water						
2.	Use appropriate mix/load sites and measures, per this BMP						
3.	Practice IPM and use all pesticides in accordance with label						
4.	Rinse, recycle, or dispose of empty pesticide containers following all applicable regulations						
13.2. Level I - Pharmaceutical Use and Disposal							
1.	Use FDA-approved products, and mix only the amount needed						
2.	Follow label and dosing instructions						
3.	Dispose of spent needles and unused pharmaceutical products responsibly						

EXHIBIT C

List additional BMPs you are implementing per your conservation plan that are not listed in the above checklist.

FOTG #	Practice Name/Description	In Use/CP #	Planned
		Check Below	Enter mo./yr.

BMP #	Comments: Please enter "other" reasons below for not implementing BMPs.

BMP Group	Justification for additional time to implement specified Level I BMPs
2.2	
2.3	
5.3	
6.3	

EXHIBIT C

APPENDIX D

HUNTING LEASE BETWEEN THE COUNTY OF VOLUSIA
AND DEEP CREEK SPORTSMAN CLUB, INC.

HUNTING LEASE BETWEEN
THE COUNTY OF VOLUSIA
AND
DEEP CREEK SPORTSMAN'S CLUB, INC.
DEEP CREEK PRESERVE HUNTING LEASE
3960 EAST NEW YORK AVENUE
DELAND, FLORIDA

**"ORIGINAL - DO NOT REMOVE
FROM PROJECT FILE"**

THIS HUNTING LEASE is made as of the date of the last signature on this Lease by and between COUNTY OF VOLUSIA, herein called "Landlord," and Deep Creek Sportman's Club, Inc., herein called "Tenant".

WITNESSETH:

SECTION 1. PREMISES. Landlord, in consideration of the performance by Tenant of those duties and obligations imposed upon Tenant under this Lease and Tenant's compliance with the terms and conditions of this Lease, hereby leases and lets, to Tenant, for the purposes and subject to the provisions set forth in this Lease, all that certain real property comprised of approximately 3220 acres, more or less, of land (the "Demised Premises"), together with all appurtenances thereto and such improvements owned by Landlord, if any, as presently exist thereon situated in the County of Volusia, Florida, which Demised Premises is more particularly described in Exhibit A, attached hereto and made a part hereof for all purposes, subject to all matters of record or visible on the ground affecting the Demised Premises.

SECTION 2. TERM. The Lease shall have an initial term of five (5) years with an option for one (1) subsequent five (5) year renewal exercisable at the mutual written option of the County and Tenant. The initial Term shall commence on October 16, 2013, and shall expire on October 16 2018. In no event shall this Lease extend beyond, October 16, 2023.

SECTION 3. RENT. The Tenant shall pay at the time and place herein provided, as follows:

- A. Annual Payments. Tenant agrees to pay to Landlord as rental for the use and occupancy of the Demised Premises the sum of \$7.50 per acre on approximately 3220 acres of land, payable annually in advance for the following year beginning 10 days after the fully executed lease agreement and annually thereafter.
- B. Tenant agrees to pay all compensation to the County at the time and in the manner provided in this Lease in lawful money of the United States of America, without demand, deduction or set off.
- B. Place For Payments And Statements. All payments shall be made by the Tenant to the Landlord hereunder and shall be made at the office of the Landlord located at 123 West

Indiana Avenue, Room 201, DeLand, Florida, made payable to the Division of Environmental Management.

SECTION 4. PURPOSES: RESERVED RIGHTS.

- A. **Permitted Uses.** This Lease is only for the permitted use of hunting lease rights as further described in Exhibits A and B, , on the Demised Premises.
- B. **Reservations.** Landlord reserves the full use and enjoyment, including the right of ingress and egress, to all of the Demised Premises for any and all purposes other than for the purposes stated above, including but not limited to:
- (i) all rights of every kind and character (directly, through agents, lessees or otherwise) reasonably incident to any oil, gas and mineral estate in the Demised Premises, including, but not limited to, all rights to such use of the surface estate in the Demised Premises as may be reasonably necessary or appropriate for purposes of exploring (specifically including but not limited to every character of geophysical exploration), mining, drilling, and developing and operating the Demised Premises for oil, gas and other minerals, and producing, storing, treating, transporting and marketing them;
 - (ii) the right to grant other surface leases or contracts for purposes other than those stated above, including but not limited to exploitation of sand, gravel, shell deposits, and timber;
 - (iii) the right enter—and the right to grant prospective purchasers of the Demised Premises the right to enter—the Demised Premises at all reasonable times to take groundwater and core samples, install monitoring wells, make soil tests, test borings, geophysical borings, topographical and fault studies and all other surveys, studies, tests and analyses that Landlord or any such prospective purchaser may deem necessary; and
 - (iv) the right to grant rights-of-way and permits for canals roads, pipelines, telephone and telegraph lines, and electric transmission lines.
- C. **Prohibited Uses.** All uses by Tenant of the Demised Premises not expressly permitted by this Lease are prohibited, including, but not limited to the following prohibited uses:
- (i) operation of feedlot;
 - (ii) committing, or suffering to be committed, any nuisance or other act that might disturb the quiet enjoyment of any person or business located within a reasonable distance of the Demised Premises;
 - (iii) harvesting timber;
 - (iv) mining or removing any topsoil, gravel, shell deposits or other substances from the soil;
 - (v) conducting, or permitting the conduct of, any dangerous activities on the Demised

Premises, including, but not limited to, the setting of any open fires or the use of any explosive devices;

(vi) any other prohibited items as outlined in Exhibit B, Scope of Work/Restrictions.

- D. **Environmental and Other Laws.** Tenant, at his sole expense, will comply, and will cause Tenant's Agents (hereinafter defined) to comply, with any and all applicable laws, statutes, ordinances, permits, orders, decrees, guidelines, rules and regulations in any way applicable to Tenant, Tenant's property or the Demised Premises ("*Legal Requirements*"), including any Legal Requirement pertaining to health or the environment ("*Applicable Environmental Laws*"), including, without limitation, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, the Resource Conservation and Recovery Act, Toxic Substances Control Act (TSCA) and Title III, and the regulations promulgated pursuant thereto, and in all other Environmental Regulations applicable to Tenant, any of the Leased Premises or the business operations conducted by Tenant thereon, as each of the foregoing may be amended from time to time. Tenant will not keep, store, generate or dispose of or permit to be kept, stored, generated or disposed of, any substance in or conduct, or permit to be conducted, any operation from the Demised Premises which might emit offensive or hazardous odors or conditions onto or into the Demised Premises or the property located outside the Demised Premises, including, without limitation, any "hazardous materials," "hazardous substances," or "solid waste" (as such terms are defined under the Applicable Environmental Laws) or otherwise take any actions which could impose liability on Landlord or any of Landlord's Related Parties (defined below) under any Applicable Environmental Law.

SECTION 5. CONDITIONS; MAINTENANCE.

- A. **Condition.** Tenant has inspected and examined the Demised Premises, is fully familiar with the present condition of the Demised Premises, has determined that the Demised Premises is fully suitable to Tenant for Tenant's intended uses, and accepts the Demised Premises in its present condition, "AS IS," "WHERE IS," and "WITH ALL FAULTS" without recourse to Landlord.
- B. **Repairs and Improvements—Landlord.** Landlord shall not be required to make any repairs or improvements of any kind or nature whatsoever on or to the Demised Premises during the term of this Lease.
- C. **Repairs and Improvements—Tenant.** Tenant shall, promptly after this Lease becomes effective and with reasonable diligence thereafter, maintain the Demised Premises which are subject to the terms of this Lease.
- D. **Tenant's General Obligations to Maintain the Demised Premises.** Tenant shall also mow and clear all existing pastures as reasonably necessary to maintain them in a condition capable of being further maintained by normal tractor-powered mowers and brush hogs. As a further example, Tenant shall also avoid depleting the fertility of the soil, , or causing the existing native and improved dryland grasses to be killed or replaced by brush, weeds, vines or other less desirable vegetation. Tenant shall abide to the conditions set forth in Exhibit B.

SECTION 6. SERVICE OF NOTICES. All notice required under this Agreement shall be in writing and shall be sent by certified United States Mail or national parcel service, postage prepaid, return receipt requested, or by hand-delivery with a written receipt of delivery, addressed to the party for whom it is intended at the place last specified. The place for giving notice shall remain the same as set forth herein until changed in writing in the manner provided in this section. For the present, the parties designate the following:

In the case of Landlord:	with a copies of legal notices to:
County of Volusia Attn: County Attorney Address: 123 W. Indiana Ave., Rm. 301 DeLand, Florida 32720 Phone: 386-736-5950	County of Volusia Attn: County Attorney Address: 123 W. Indiana Ave., Rm. 301 DeLand, Florida 32720 Phone: 386-736-5950
In the case of Tenant:	with a copy of legal notices to:
Deep Creek Sportman's Club, Inc. 242 N. Orange Avenue Lake Helen, Florida 32744 Attn: Kenneth Mullen sailormanpete@gmail.com Phone: 386-527-6077	Deep Creek Sportman's Club, Inc. 242 N. Orange Avenue Lake Helen, Florida 32744 Attn: Kenneth Mullen sailormanpete@gmail.com Phone: 386-527-6077

SECTION 7. ALTERATIONS AND COVENANT AGAINST LIENS. Tenant shall submit to Landlord any request for alterations, changes or improvements to the Demised Premises, in writing, with plans and specifications therefore. Landlord, at its reasonable discretion, shall have the right to approve or disapprove such alterations, changes or improvements. If permitted by the Landlord, all improvements shall be done at the sole cost of the Tenant, and no liens of any kind shall be permitted ever to attach to Landlord's property. Tenant shall have no power or authority to create any lien or permit any lien to be attached against the property of Landlord; all parties contracting with Tenant are hereby charged with notice that they must look solely to the Tenant to secure payment for work done or materials furnished. Landlord shall have the right to record a Memorandum of Lease which prohibits the attachment of any kind of lien to Landlord's property on account of activities by Tenant. If a lien is nevertheless filed against the Landlord's property based on alterations, improvements or other activities by Tenant, Tenant shall remove such a lien at Tenant's sole expense within five (5) business days after demand for such removal from Landlord.

Any additions, alterations, improvements, repairs or replacements, and any fixtures attached to the premises, shall become and be a part of the Demised Premises and shall belong to the Landlord as Landlord's property

SECTION 8. UTILITIES. The Tenant shall pay promptly all charges for meters installed and all charges for water, sewage disposal, electricity, gas, garbage collection and other utilities supplying the Demised Premises. In the event the Tenant should fail to make any of the utility payments when due, the Landlord may require the amounts due to be paid by Tenant as additional Rent on the date the next Rent payment is due or thereafter.

SECTION 9. INSURANCE.

Insurance

A. Required Types of Insurance

The Tenant shall purchase and maintain at its own expense, during the term of this Contract the following types and amounts of insurance with limits no less than those shown below, in the form and from companies satisfactory to the County:

<u>SCHEDULE</u>	<u>LIMITS</u>
Workers' Compensation	Florida Statutory Coverage
Commercial General Liability	\$2,000,000. General Aggregate
Premises-Operations	\$2,000,000. Products/CompOps Aggregate
Contractual Liability	\$1,000,000. Each Occurrence

(The County of Volusia shall be named as an additional insured under all of the above Commercial General Liability coverage.)

1. Umbrella or Excess Liability policies may be used to obtain the total limits of liability required to meet the required limits of coverage stated above. Evidence of such coverage should clearly demonstrate the underlying coverages/policies that are included.
2. Workers' Compensation Insurance. Per Section 9A, Workers' Compensation insurance is required for all employees of the Tenant, employed or hired to perform or provide Work or Services under this Contract or that is in any way connected with Work or Services performed under this Contract, without exclusion for any class of employee, and shall comply fully with the Florida Workers' Compensation Law (Chapter 440, Florida Statutes, Workers' Compensation Insurance) and include Employers' Liability Insurance with limits no less than the statutory amount shown above per occurrence.
 - a. Tenant and its Subcontractors, or any associated or subsidiary company doing Work on County property or under this Contract must be named in the Workers' Compensation coverage or provide proof of their own Workers' Compensation coverage, without exclusion of any class of employee, and with a minimum of the statutory limits per occurrence for Employer's liability coverage. Further, if the Tenant's Subcontractors fail to obtain Workers' Compensation insurance and a claim is made against the County by the uncovered employee of said Subcontractor of the Tenant, the Tenant shall indemnify, defend, and hold harmless the County from all claims for all costs including attorney's fees and costs arising under said employee(s) Workers' Compensation insurance claim(s).
3. Commercial General Liability Insurance. Per Section 9A, Commercial General Liability insurance, with a limit of not less than the amounts

amounts shown above with an aggregate limit and per occurrence basis, including coverage for the Tenant's operations, independent Contractors, Subcontractors and "broad form" property damage coverages protecting itself, its employees, agents, Contractors or subsidiaries, and their employees or agents for claims for damages caused by bodily injury, property damage, or personal or advertising injury, products liability/completed operations including what is commonly known as groups A, B, and C (libel, false arrest, slander). Such policies shall include coverage for claims by any person as a result of actions directly or indirectly related to the employment of such person or entity by the Tenant or by any of its Subcontractors arising from Work or Services performed under this Contract. Public liability coverage shall include either blanket contractual insurance or a designated contract contractual liability coverage endorsement, indicating expressly the Tenant's contract to indemnify and hold harmless the County as provided in this Contract. The commercial general liability policy shall be endorsed to include the County as an additional insured. The commercial general liability policy shall provide primary coverage for the Demised Premises..

4. Primary and Excess Coverage. Any insurance required may be provided by primary and excess insurance policies.

B. Insurance Requirements

1. General Insurance Requirements:

- a. All insurance policies shall be issued by insurers licensed and/or duly authorized under Florida Law to do business in the State of Florida and all insuring companies are required to have a minimum rating of A- in the "Best Key Rating Guide" published by A.M. Best & Company, Inc.
- b. Approval by County of any policy of insurance shall not relieve Tenant from its responsibility to maintain the insurance coverage required herein for the performance of Work or Services by the Tenant or its Subcontractors for the entire term of this Contract and for such longer periods of time as may be required under other clauses of this Contract.
- c. Waiver of Subrogation. The Tenant hereby waives all rights against the County and its Subcontractors to the extent of the risk coverage by any insurance policy required hereunder for damages by reason of any claim, demand, suit, or settlement (including workers' compensation) for any claim for injuries or illness of anyone, or perils arising out of this Contract. The Tenant shall require similar waivers from all its Subcontractors. This provision applies to all policies of insurance required under this Contract (including Workers' Compensation, and general liability).

- d. County Not Liable for Paying Deductibles. For all insurance required by Tenant, the County shall not be responsible or liable for paying deductibles for any claim arising out of or related to the Tenant's business or any Subcontractor performing Work or Services on behalf of the Tenant or for the Tenant's benefit under this Contract.
- e. Cancellation Notices. During the term of this Contract, Tenant shall be responsible for promptly advising and providing County of Volusia's Risk Management Division and the Purchasing and Contracts Division with copies of notices of cancellation or any other changes in the terms and conditions of the original insurance policies approved by the County under this Contract within two (2) business days of receipt of such notice or change.
- f. Additional Insured Designation The County shall be named as an additional insured or additional named insured subject to review and determination by County's Risk Manager on all policies required under this Contract except workers compensation.

C. Proof of Insurance

- 1. The Tenant shall be required to furnish evidence of all required insurance in the form of certificates of insurance which shall clearly outline all hazards covered as itemized herein, the amounts of insurance applicable to each hazard, and the expiration dates.
- 2. The Tenant shall furnish proof of insurance acceptable to the County prior to or at the time of execution of this Contract and the Tenant shall not commence Work or provide any Service until the Tenant has obtained all the insurance required under this Contract and such insurance has been filed with and approved by the County. Upon request from the County, the Tenant shall furnish copies of the following types of insurance policies and any changes or amendments thereto, immediately, to the County and County's Risk Management and Purchasing and Contracts Divisions prior to the commencement of any contractual obligations. This Contract may be terminated by the County, without penalty or expense to County if at any time during the term of this Contract proof of any insurance required hereunder is not provided to the County.
- 3. All certificates of insurance shall clearly indicate that the Tenant has obtained insurance of the type, amount and classification required by this Article. No Work or Services by Tenant or its Subcontractors shall be commenced until County has approved these policies or certificates of insurance. Further, the Tenant agrees that the County shall make no payments pursuant to the terms of this Contract until all required proof or evidence of insurance has been provided to the County. This Tenant may be terminated by the County, without penalty or expense, if proof of any insurance required hereunder is not provided to the County.

4. The Tenant shall file replacement certificates with the County at the time of expiration or termination of the required insurance occurring during the term of this Contract. In the event such insurance lapses, the County expressly reserves the right to renew the insurance policies at the Tenant's expense or terminate this Contract but County has no obligation to renew any policies.

- D. The provisions of this Article shall survive the cancellation or termination of this Contract.

SECTION 10. ASSIGNMENT. The Tenant shall not assign this Lease or any estate or interest herein, whether by sublease, underlease, license, concession or otherwise which would permit the occupancy or possession of the Demised Premises or any part thereof by anyone other than Tenant. In addition, the Landlord, shall not assign the property without prior notice to the Tenant.

SECTION 11. TENANT'S ADDITIONAL COVENANTS. Tenant shall comply with all reasonable rules and regulations which may be imposed by Landlord concerning the care and use of the Demised Premises and the common areas including those attached to this Lease. Tenant shall comply with all laws, rules, regulations and ordinances of all governmental authorities having jurisdiction over the Demised Premises. Tenant shall not perform or allow to be performed any acts or practices, or sell any goods or merchandise or render any services in violation of any law or which may be a nuisance or menace to the public or other tenants, or commit waste or permit waste to be committed on the premises, or engage in or permit any illegal activities to take place on the premises.

Tenant shall not allow any loud noises to emanate from its premises which are objectionable to Landlord or other tenants.

SECTION 12. INDEMNITY AND LIABILITY.

Limitation of Liability and Indemnification of County

- A. The Tenant shall indemnify and hold harmless the County of Volusia and its public officials (elected and appointed), officers, agents, servants and employees from and against all claims of every kind and nature including, but not limited to losses incurred or suffered as a result of bodily injury to any person, damage to personal, real or intellectual property, business losses or other damages to the extent caused by the negligence, recklessness, or intentional conduct of the Tenant, its members, employees, customers, invitees, licensees, guests or agents or other third parties present at the Demised Premises pursuant to the Lease, except that the Tenant will not be required to indemnify and hold the County harmless if such claim, damage, loss and expense is the result of the sole negligence of the County. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person. The obligation to indemnify is enforceable by the County notwithstanding any agreement made by the County with any claimant to resolve any claim for which the Tenant has a duty to indemnify the County. The extent of indemnification shall include, in addition to any sums paid to the claimant(s), the reasonable attorney's fees and costs incurred by the County as a

| result of any claim.

- B. In all claims against the County, or any of its public officials (elected and appointed), successors and successors in interest, officers, agents, attorneys, and employees by any employee of Tenant, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, no indemnification obligation shall be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Tenant, or any Subcontractor or Sub-subcontractor under Florida's Workers' Compensation acts, disability benefit acts, or other employee benefit acts.
- C. Tenant's indemnification obligations under this Section, Limitation of Liability and Indemnification of County, are subject to County or the indemnified party giving Tenant (a) prompt written notice of any indemnifiable claim; (b) reasonable assistance in Tenant's defense of the indemnifiable claim; and (c) sole authority to defend or settle the indemnifiable claim, provided that County or the indemnified party shall have the right to approve any settlement of an indemnifiable claim to the extent such settlement imposes any obligations on County or the indemnified party. County, or the indemnified party, may retain its own legal counsel at its own expense to monitor such litigation.
- D. Sovereign Immunity. County expressly retains all rights, benefits and immunities of sovereign immunity in accordance with Section 768.28, Florida Statutes (as amended). Notwithstanding anything set forth in any Article of this Agreement to the contrary, nothing in this Agreement shall be deemed as a waiver of immunity of limits of liability of County beyond any statutory limited waiver of immunity of limits of liability which may have been adopted by the Florida Legislature or may be adopted by the Florida Legislature and the cap on the amount and liability of County for damages regardless of the number or nature of claims in tort, equity, or contract shall not exceed the dollar amount set by the legislature for tort. Nothing in this Agreement shall inure to the benefit on any third party for the purpose of allowing any claim against County which would otherwise be barred under the Doctrine of Sovereign Immunity or operation of law.
- E. In no event shall either party be liable to the other for any incidental, indirect, special, punitive, or consequential damages even if the party knew or should have known about the possibility of such damages for any provision of the Agreement.
- C. No Third Party Beneficiaries.
Nothing in this Agreement shall inure to the benefit of any third party for the purpose of allowing any claim against Landlord, which would otherwise be barred under the Doctrine of Sovereign Immunity or by operation of law.

SECTION 13. WAIVER. One or more waivers of any covenant or condition by either party shall not be construed as a waiver of a subsequent breach of the same covenant or condition, and a consent or approval to or of any act requiring consent or approval shall not be deemed to waive or

render unnecessary such consent to or approval of any subsequent similar act.

SECTION 14. QUIET ENJOYMENT. The Tenant, performing all the other covenants and conditions aforesaid on Tenant's part to be observed and performed, shall and may peaceably and quietly have, hold and enjoy the premises hereby demised for the term aforesaid, free from disturbance by the Landlord, or by anyone claiming by, through or under the Landlord.

SECTION 15. SURRENDER. Tenant shall yield and deliver possession of the Leased Premises to Landlord at the termination of this Agreement, by expiration of time or otherwise, or the expiration of any renewal or extension hereof, in good condition, excepting only reasonable wear and tear, fire or other casualty, and Tenant shall have the right at any time during said term, or any renewal or extension hereof, and for thirty (30) days after the termination thereof, to remove its property therefrom, excluding any buildings or fixtures.

SECTION 16. MISCELLANEOUS. This Lease and the Exhibits, Rules, Regulations Rider and/or Addenda, if any, attached hereto, set forth the entire agreement between the parties. Any prior conversations or writings have been merged herein and are extinguished. No subsequent amendment to this Lease shall be binding upon Landlord or Tenant unless reduced to writing and signed by all parties. Submission of this Lease for examination does not constitute an option for the Demised Premises and the Lease shall become effective as a Lease only upon execution by the parties and delivery thereof by Landlord to Tenant. If any provision contained in a rider or addenda is inconsistent with the printed provision of the Lease, the provision contained in said rider or addenda shall supersede said printed provision in the Lease.

The captions, numbers and index appearing herein are inserted only as a matter of convenience and are not intended to define, limit, construe or describe the scope or intent of any paragraph, nor in any way affect this Lease.

This Commercial Lease Agreement shall be construed in accordance with the laws of the State of Florida. All litigation arising out of this Lease or in connection therewith shall be commenced in the County where the Demised Premises is located.

THE LANDLORD AND TENANT HEREBY KNOWINGLY, VOLUNTARILY AND INTENTIONALLY WAIVE THE RIGHT EITHER OF THEM MAY HAVE TO A TRIAL BY JURY IN RESPECT OF ANY LITIGATION BASED UPON THIS LEASE OR ARISING OUT OF, UNDER OR IN CONNECTION WITH THIS LEASE AND ANY AGREEMENT CONTEMPLATED TO BE EXECUTED IN CONJUNCTION HERewith, OR ANY COURSE OF CONDUCT, COURSE OF DEALING, STATEMENTS (WHETHER VERBAL OR WRITTEN) OR ACTIONS OF ANY PARTY. THIS PROVISION IS A MATERIAL INDUCEMENT FOR THE LANDLORD ENTERING INTO A LEASE WITH TENANT.

This Commercial Lease Agreement shall be binding upon and the benefits hereunder shall inure to the heirs, personal representatives, estates, successors and assigns of the parties hereto. Tenant shall not record this Lease or any of its Exhibits or any Memorandum relating thereto, without the prior written consent of the Landlord.

SECTION 17. COMPLIANCE WITH LAW. Tenant, at Tenant's expense, shall comply with all laws, rules, orders, ordinances, dictions, regulations and requirements of federal, state, county and

municipal authorities pertaining to Tenant's use of the Premises and with the recorded covenants, conditions and restrictions, regardless of when they become effective, including, without limitation, all applicable federal, state, and local laws, regulations or ordinances pertaining to air and water quality, waste disposal, air emissions and other environmental matters, all zoning and other land use matters, and utility availability, and with any direction of any public officer or officers, pursuant to law, which shall impose any duty upon Landlord or Tenant with respect to the use or occupation of the Premises


SECTION 18. Termination

- A. The resulting Agreement may be terminated by (a) either party upon the material breach by the other party if such breach is not cured within thirty (30) days written notice from the non-breaching party, or (b) by County upon at least 30 (thirty) calendar days, prior written notice to tenant whenever the County shall determine that such termination is in the best interest of the County.
- B. County may terminate the resulting Agreement for convenience or non-appropriation upon at least thirty (30) calendar days' prior written notice to Tenant.
- C. The Respondent may cancel the resulting contract with one-hundred eighty (180) days written notice to the Director of Purchasing and Contracts. Failure to provide proper notice to the County may result in the Bidder being barred from future business with the County.
- D. After Tenant's receipt of a notice of termination pursuant to Paragraph A above (or to the extent Tenant has not cured a material breach within 30 (thirty) days notice from County), and except as otherwise directed by the County, the Tenant shall:
 - 1. Vacate the Premises on or before the date specified in the notice of termination.
 - 2. Notify all of Tenant's members, customers, invitees, licensees, guests, vendors, service providers and any other third parties that may otherwise have reason to enter the Premises pursuant to the Lease that no entry into or upon the Premises shall occur after the date specified in the notice of termination without the written consent of the County.

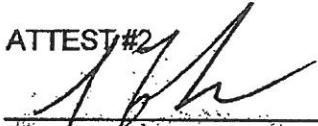
After receipt of a notice of termination, the Tenant shall submit to the County its claim for amounts owed by County for any rent paid in advance which would have applied to any length of time after the effective date of termination. Such claim shall be submitted promptly but in no event later than thirty (30) days from the effective date of termination. Upon failure of the Tenant to submit its claim within the time allowed, the County may determine on the basis of information available to it, the amount, if any, due to the Tenant by reason of the termination and shall thereupon pay to the Tenant the amount so determined.

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

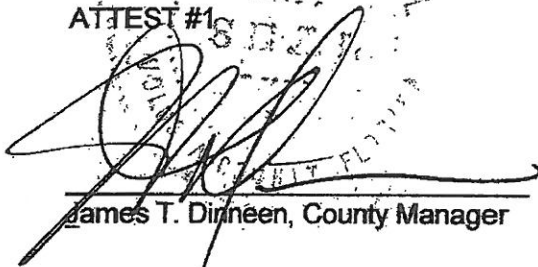
ATTEST #1


DONALD SNYDER

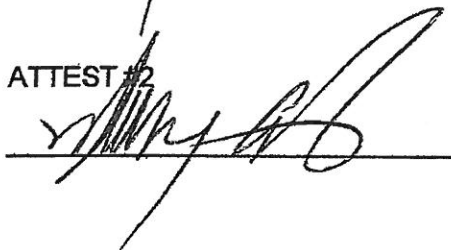
ATTEST #2


Andrew Erbes

ATTEST #1


James T. Dinneen, County Manager

ATTEST #2


James T. Dinneen, County Manager

TENANT:

Deep Creek Sportman's Club, Inc.

By: Kenneth w Mullen

Name: Kenneth w Mullen

LANDLORD:

COUNTY OF VOLUSIA

By: 
Jason P. Davis, County Chair

Dated: 10/16/13

Exhibit A-Deep Creek Preserve Hunting Lease Boundary
Exhibit B-Scope of Services

County Council Date: October 10, 2013

Exhibit A, Deep Creek Preserve Property Boundary

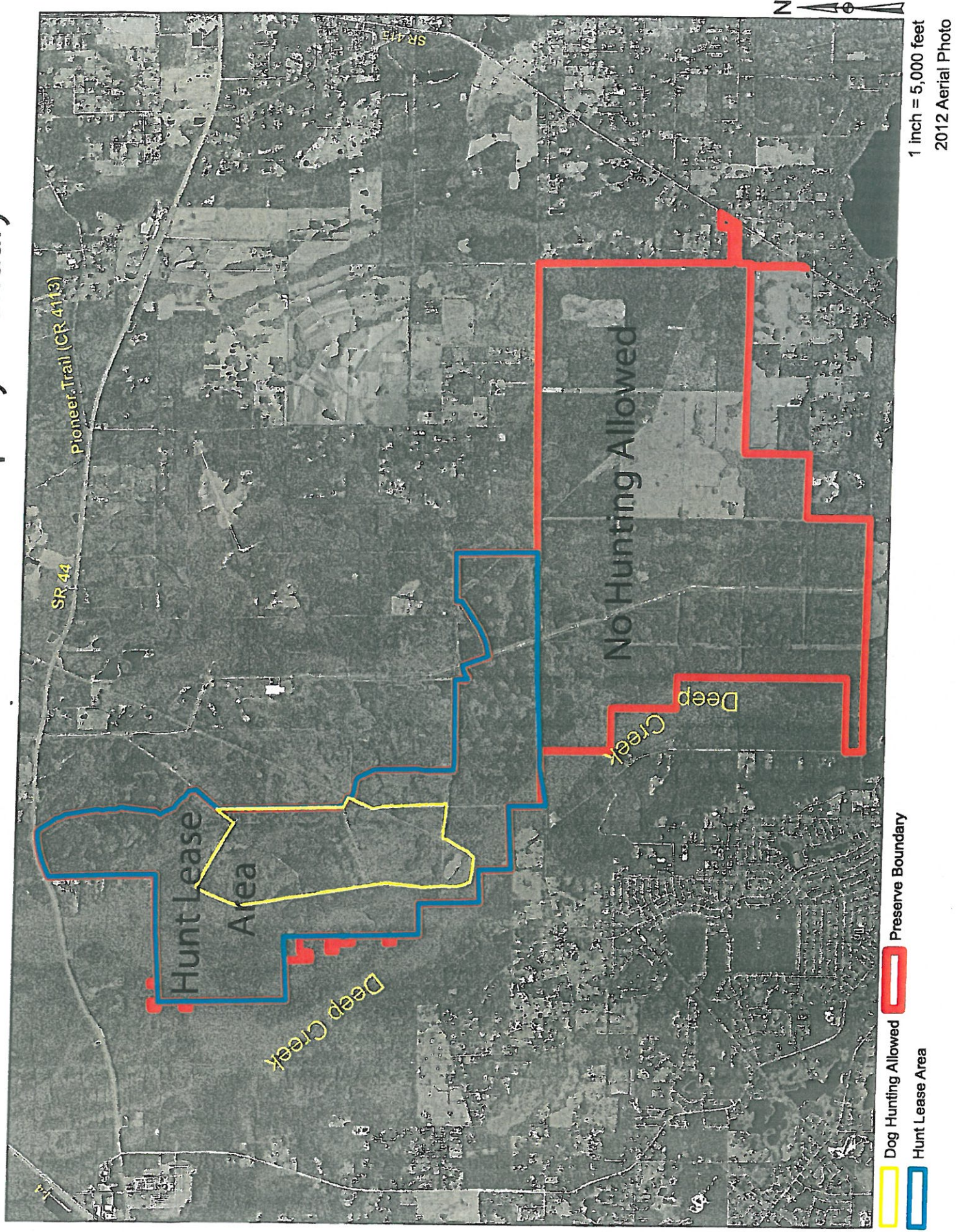


EXHIBIT B-ADDITIONAL LEASE TERMS

1.0 SCOPE OF WORK

RESTRICTIONS:

1. Tenant must be in good standing with regards to any monies owed to the County of Volusia during the term of the Lease.
2. There shall be no hunting in the southern portion (aka Leffler tract) of Deep Creek Preserve (see Exhibit A).
3. No tree stands shall be installed within one hundred (100) yards of the property boundary and designated hunting area.
4. Tenant shall be limited to a maximum of one member for every 175 acres of the leased premises. Tenant shall provide a complete list and contact information (name address, phone (cell, home, and work), email and vehicle information) on all authorized users of the leased land to Volusia County Environmental Management.
5. Tenant shall develop a set of rules and regulations for all authorized users and guests. The rules shall include but not limited to rules regarding vehicle (including ATVs) usage and decals, guests, and a prohibition on spot lighting. Tenant's rules shall be submitted and shall be approved by the County Project Manager.
6. No timber, plants, non-game animals, minerals, sand or forest products shall be removed from said premises by the Tenant without the express written consent of Volusia County Environmental Management (excluding legal game). Excavation, chopping, and clearing are prohibited without the express written consent of the Volusia County Environmental Management. Grading and road repair shall be allowed.
7. Tenant may maintain, at Tenant's sole cost and expense and in full compliance with all applicable laws, statutes, rules, and regulations, existing wildlife food plots on the Property for the sole purpose of attracting and feeding deer, turkey and other wildlife. The location and size of each wildlife food plot and the species of plant to be planted in the plot area must be mapped and provided to the County by the Tenant. The maintenance of any wildlife food plot shall not damage, destroy or otherwise adversely affect any trees or seedlings located on the property. The County may require Tenant to remove any such wildlife food plots on the property at any time upon notice to Tenant. In the event such wildlife food plots are not removed within ten (10) days after Tenant's receipt of such notice, the County or its agents may remove, at Tenant's cost and expense, such wildlife food plots without any liability to the County.
8. A single primitive (tents only) hunt camp will be designated by Volusia County Environmental

Management. Tenant is required to provide and maintain portable restrooms at the designated campsite.

9. All hunting dogs shall be outfitted with tracking and shock collars, similar to Trashbreaker and Astro units. All dogs shall be under the care and control of the owner or designated responsible party at all times.

Tenant may bring up to 24 dogs onto the property, but only six may be hunting at any one time. Unless hunting, dogs shall remain leashed or kenneled while on the property. Authorized users shall at all times while on the property, maintain in their possession a current certificate of rabies vaccination for each dog. Authorized users shall ensure that the dog(s) are licensed pursuant to any applicable Volusia County ordinance.

