

GEORGIA FARM*A*SYST



FARM ASSESSMENT SYSTEM

BEEF PRODUCTION

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PRE-ASSESSMENT:

Why Should I Be Concerned?

The past several years have witnessed relatively small percentage changes in Georgia's beef cow and beef replacement heifer numbers. While livestock number fluctuates with market economics, there are approximately 700,000 beef cows and 110,000 beef replacement heifers on 24,000 Georgia farms annually. Beef operations exist in all 159 of Georgia's counties, are predominately small operations (less than 50 head), and are often companion enterprises to off-farm employment or other farm commodities.

Society is particularly concerned about maintaining clean water for drinking, recreational and wildlife use. Beef production practices, such as livestock water supply and supplemental feeding areas, are often visible to the public. Beef cattle producers are encouraged to voluntarily adopt practices that minimize adverse environmental impacts. Addressing problem areas can maintain or increase the productivity of the property while minimizing public concerns about agricultural impacts on environmental quality. Public concern could translate into water protection regulations if agriculture and industry fail to take voluntary action to do their part in protecting water quality and the environment. With respect to environmental quality, every beef cattle operation counts and the voluntary stewardship actions of every producer are important.

As the mainstay of beef operations, properly managed *perennial* grass pastures are one of the most effective measures to reduce erosion and sedimentation of surface water. Additionally, healthy pastures reduce surface *runoff* and nutrient loss. Over-utilized pastures result in poor animal performance, unhealthy forage stands, and contribute to environmental degradation. Efficient beef cattle production and environmental enhancement can coexist when producers utilize management practices demonstrated to be beneficial to both objectives. Nutrient management, minimum grazing height, alternative water supply, streambank protection, and heavy use area protection are examples of practices that can enhance environmental quality.

About This Assessment

- This assessment allows you to evaluate the environmental soundness of your farm and beef production practices.
- You are encouraged to work through the entire document.
- The assessment asks a series of questions about your beef production practices.
- The assessment evaluation uses your answers (rankings) to identify practices or structures that are at risk and should be modified to prevent pollution.
- The beef production practices facts give an overview of sound environmental practices that can be used to prevent pollution caused directly by beef production practices.
- You are encouraged to develop an action plan based on your needs as identified by the assessment.
- Farm*A*Syst is a voluntary program.
- The assessment should be conducted by you for your use. If needed, a professional from the Georgia Cooperative Extension Service, the USDA Natural Resources Conservation Service, or one of the other partnership organizations can provide assistance in completing the assessment.
- No information from this assessment needs to leave your farm.

* Words found in italics are defined in the glossary.

ASSESSMENT:

Assessing Your Beef Production Practices.

For each category listed on the left, read across to the right and circle the statement that best describes conditions on your farm. If a category does not apply, for example confined production areas, then simply skip the question. Once you have decided on the most appropriate answer, look above the description to find your rank (4, 3, 2 or 1) and enter that number in the “RANK” column. The entire assessment should take less than 30 minutes. A glossary is on page 13 to clarify words found in italics throughout this assessment.

BEEF PRODUCTION PRACTICES					
	LOW RISK (rank 4)	LOW-MOD RISK (rank 3)	MOD-HIGH RISK (rank 2)	HIGH RISK (rank 1)	RANK
HEAVY USE AREAS					
General Location	Heavy use areas located at least 100 ft. downslope from well; 100 ft. from surface water.	Heavy use areas located 50 to 100 ft. downslope from well; 100 ft. from surface water.	Heavy use areas located upslope and at least 100 ft. from well; 50 ft. away from surface water.	Heavy use areas located upslope and within 100 ft. of well; within 25 ft. of surface water.	
Runoff	No runoff from area, 50 to 100 ft. of perennial vegetation surrounds.	Runoff managed with diversions, 25 to 50 ft. of perennial vegetation surrounds.	No runoff management, 25 to 50 ft. of perennial vegetation surrounds.	No runoff management, less than 25 ft. of perennial vegetation surrounds.	
Maintenance	Annual inspection of area; scrape, replace stone, and remove organic matter, if needed.	Area is inspected every 1 to 2 years; scrape, replace stone and remove organic matter, if needed.	Area is inspected every 2 to 3 years; organic matter is allowed to build up; maintenance is minimum.	Area is not routinely inspected, no scraping or replacement of stone, organic matter is not removed.	
CONFINED PRODUCTION AREAS					
General Location	Confined production areas located at least 100 ft. downslope from well; 100 ft. from surface water.	Confined production areas located 50 to 100 ft. downslope from well; 100 ft. from surface water.	Confined production areas located upslope and at least 100 ft. from well; 50 ft. away from surface water.	Confined production areas located upslope and within 100 ft. of well; within 25 ft. of surface water.	
Lot runoff and management	No runoff from area, 50 to 100 ft. of perennial vegetation surrounds lot or area.	Runoff management with diversions, 25 to 50 ft. of perennial vegetation surrounds lot or area.	No runoff management, 25 to 50 ft. of perennial vegetation surrounds lot or area.	No runoff management, less than 25 ft. of perennial vegetation surrounds lot or area.	

BEEF PRODUCTION PRACTICES

	LOW RISK (rank 4)	LOW-MOD RISK (rank 3)	MOD-HIGH RISK (rank 2)	HIGH RISK (rank 1)	RANK
Solid animal waste handling	Solid wastes are collected weekly and redistributed to areas with greater than 90% ground cover using nutrient management guidelines, solid waste is distributed evenly and dragged.	Solid wastes are collected every 1 to 4 weeks and redistributed to areas with 75 to 90% ground cover using nutrient management guidelines, solid waste is distributed evenly.	Solid wastes are allowed to accumulate for greater than 4 weeks and are redistributed to areas with 60 to 75% ground cover, nutrient management guidelines are not used.	Solid wastes are allowed to accumulate for greater than 4 weeks and are redistributed to areas with less than 60% ground cover, nutrient management guidelines are not used.	

STREAMBANKS, DITCHES, AND ADJOINING AREAS

Condition of vegetative strip along streambank or ditch	90% ground cover with perennial species within 15 ft. of streambank, a minimum number of cattle trails and manure deposits exist.	75 to 90% ground cover with perennial species within 15 ft. of streambank, numerous cattle trails and manure deposits are evident.	60 to 75% ground cover with perennial species within 15 ft. of streambank, some signs of streambank erosion are evident and numerous manure deposits exist.	Less than 60% ground cover with perennial species within 15 ft. of streambank, streambank erosion is very evident and numerous manure deposits exist.	
Cattle access to streambank or ditch areas¹	Cattle access is limited to designated areas by rotational use, or alternative water supply sources are provided, or livestock are excluded by fencing; condition of streambanks with animal access is frequently inspected.	Cattle are allowed seasonal access at designated areas, condition of streambanks with animal access is inspected.	Cattle are allowed continual access at designated areas, condition of streambanks with animal access is not routinely inspected.	Cattle are allowed unlimited access throughout the year, condition of streambanks with animal access is not routinely inspected.	

¹Stream reaches supporting populations of threatened and/or endangered species should be excluded from livestock use, otherwise environmental risk is high.

FARM PONDS

Condition of vegetative strip along margins of farm pond	90% ground cover of perennial species within a 30 ft. radius of the pond margin, a minimum number of cattle trails and manure deposits exist.	75 to 90% ground cover of perennial species within a 30 ft. radius of the pond margin, numerous cattle trails and manure deposits are evident.	60 to 75% ground cover of perennial species within a 30 ft. radius of the pond margin, some signs of bank erosion are evident and numerous manure deposits exist.	Less than 60% ground cover of perennial species within a 30 ft. radius of the pond margin, bank erosion is very evident and numerous manure deposits exist.	
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BEEF PRODUCTION PRACTICES

	LOW RISK (rank 4)	LOW-MOD RISK (rank 3)	MOD-HIGH RISK (rank 2)	HIGH RISK (rank 1)	RANK
Cattle access to farm ponds	Cattle are excluded from a farm pond; drinking water is supplied by gravity flow or pump systems, or other water supply systems.	Cattle are prevented from loafing in a farm pond; watering ramps are used for drinking water or rotational stocking minimizes use of a farm pond.	Cattle are allowed seasonal access to a farm pond for drinking water and loafing.	Cattle are allowed unlimited access to a farm pond.	
WETLANDS					
Cattle access to wetland areas²	Cattle are excluded from wetland areas.	Cattle are allowed managed access to wetland areas during periods of seasonal low water table.	Cattle are allowed managed access during periods of seasonal high water table.	Cattle are allowed unlimited access to wetland areas.	
² Wetland areas supporting populations of threatened and/or endangered species should be excluded from livestock use, otherwise environmental risk is high.					
NUTRIENT MANAGEMENT					
Soil testing	Yearly	Every 2 years	Every 3 years	Less frequent than every 3 years	
Nutrient analysis, application timing and crop budget	Nutrients are applied based on realistic crop production potential and according to seasonal plant growth, animal wastes are analyzed for nutrient content, equipment is routinely calibrated.	Nutrients are applied based on realistic crop production potential and according to seasonal plant growth, nutrients from animal wastes are estimated using table values, equipment calibrated periodically.	Nutrients are applied in excess of crop production requirements and not according to seasonal plant growth, animal wastes are estimated using table values, equipment is not calibrated.	Nutrients are applied at disposal rates that exceed crop production potential, nutrient applications are made without regard to seasonal plant growth.	
Record keeping	Good records on farm applications and nutrient production and distribution are kept.	Minimal records on farm applications and nutrient production and distribution are kept.	Minimal record keeping of on farm applications, no records of wastes leaving the farm.	No nutrient management records are kept.	

BEEF PRODUCTION PRACTICES

	LOW RISK (rank 4)	LOW-MOD RISK (rank 3)	MOD-HIGH RISK (rank 2)	HIGH RISK (rank 1)	RANK
Location of waste application in relation to water sources	All application areas are more than 100 feet from wells, surface water sources, or sinkholes; application occurs on vigorous stands of vegetation with at least 4 to 6 inches of growth and a minimum of 90% ground cover.	Most application areas are more than 100 feet from wells, surface water sources, or sinkholes; application occurs on stands of vegetation with 2 to 4 inches of growth with 75 to 90% ground cover.	Several application areas are less than 100 feet from wells, surface water sources, or sinkholes; application occurs on weakened stands of vegetation with less than 2 inches of growth with 60 to 75% ground cover.	Application areas are frequently less than 100 feet from wells, surface water sources, or sinkholes; application occurs on weak stands of vegetation with less than 2 inches of growth with less than 60% ground cover.	

PASTURE MANAGEMENT

Stocking Rate	A minimum average plant height of 3" for warm- and 4" for cool-season improved perennial forages is maintained; supplemental hay requirements are minimal and occurs less than 25% of the year.	An average plant height of 2" for warm- and 3" for cool-season improved perennial forages is maintained; supplemental hay use is significant and occurs 25 to 40% of the year.	Pastures are grazed to within 1" of the soil surface for warm- and 2" of the soil surface for cool-season improved perennial forages; feeding hay is necessary 40 to 50% of the year.	Pastures are grazed to within 1" of the soil surface for warm- and 2" of the soil surface for cool-season improved perennial forages; feeding hay is necessary greater than 50% of the year.	
Weed Invasion	Invasion of weedy species is minimal, a healthy stand of forage species is maintained, weeds comprise less than 5% of the pasture.	Weeds comprise 5 to 15% of the pasture, periodic weed control measures are taken.	Weeds comprise 15 to 30% of the pasture, weed control measures are not routinely taken.	No weed control, forage stand is suppressed due to weed invasion, weeds comprise more than 30% of the pasture.	

Number of Areas Ranked _____

(Number of questions answered, if all answered, should total 17)

Ranking Total _____

(Sum of all numbers in the "RANK" Column)

ASSESSMENT EVALUATION:

What Do I Do with These Rankings?

STEP 1: Identify Areas That Have Been Determined to be at Risk

Low risk practices (4s) are ideal and should be your goal. Low to moderate risk practices (3s) provide reasonable protection. Moderate to high risk practices (2s) provide inadequate protection in many circumstances. High risk practices (1s) are inadequate and pose a high risk for causing environmental, health, economic, or regulatory problems.

High risk practices, rankings of “1” require immediate attention. Some may only require little effort to correct, while others could be major or costly and may require planning or prioritizing before you take action. All activities identified as “high risk” or “1s” should now be listed in the action plan. Rankings of “2s” should be examined in greater detail to determine the exact level of risk and attention given accordingly.

STEP 2: Determine Your Beef Production Risk Ranking

The Overall Risk Ranking provides a general idea of how your beef production practices might be affecting your ground and surface water and the health of your pastures.

Use the Rankings Total and the Total Number of Areas Ranked as determined from the questionnaire portion of this assessment to determine the Beef Production Risk Ranking.

RANKING TOTAL ÷ TOTAL NUMBER OF AREAS RANKED = BEEF PRODUCTION RANKING

_____ ÷ _____ = _____

BEEF PRODUCTION RISK RANKINGLEVEL OF RISK

3.6 to 4Low Risk

2.6 to 3.5Low to Moderate Risk

1.6 to 2.5Moderate Risk

1.0 to 1.5High Risk

This ranking gives you an idea of how your beef production practices might be affecting water quality and pasture health. This ranking should serve only as a very general guide, not a precise diagnosis, because it represents an averaging of many individual rankings.

STEP 3: Read the Information/fact Section on Improving Your Beef Production Practices

When reading this, give some thought to how you could modify your practices to address some of your moderate and high risk areas. If you have any questions that are not addressed in the Beef Production Practices Facts portion of this assessment consult the references in the back of the publication or contact your county Extension agent or NRCS District Conservationist for more information.

STEP 4: Transfer information to Total Farm Assessment

If you are completing this assessment as part of a “Total Farm Assessment,” you should also transfer your Beef Production Risk Ranking and your identified high risk practices to the overall farm assessment.

BEEF PRODUCTION FACTS:

With a favorable climate, adapted forage species for nearly year-long grazing, and pressure to decrease the use of public lands for grazing in the western states, long term market conditions are likely to result in increased beef cattle numbers in Georgia. As beef cattle operations increase in size, practices that protect and enhance our environment will increase in importance. Several practices have been demonstrated to improve beef cattle management while protecting on- and off-farm resources.

HEAVY USE AREAS

When livestock congregate around supplemental feeding areas, mineral feeders, shade areas, and water troughs, these *heavy use areas* pose both environmental and production challenges. Livestock waste accumulation, loss of vegetation, reduced drainage, and increased soil erosion are all reasons to properly manage these areas. The amount of animal waste accumulation in an area is determined by the number of animals and the amount of time the animals are there. Waste accumulation contributes to the spread of diseases and parasites, and results in a concentrated source of nutrients that can run off the pasture or seep into groundwater. The trampling effects of animal hooves on these high traffic areas can result in loss of vegetation, reduced drainage, soil erosion, and mudholes. In combination, these factors threaten animal health and soil and water resources. Additionally, muddy areas around commonly used supplemental feeding and watering sites are a management nuisance to producers.

Unmanaged heavy use areas are particularly evident during the winter months when saturated soil conditions exist and frequent rainfall occurs. Significant portions of pastures are often seriously degraded and forage production is sacrificed as heavy use areas must be periodically relocated and weeds tend to invade where the land has been severely disturbed.

Shade, mineral feeders, hay rings, water supply, lick tanks and other supplements should be spaced out individually in the pasture to avoid creating single multi-use areas frequented by livestock. Site selection criteria should include drainage and proximity to wells and surface water. Resource rotation and attention to

placement is an effective and inexpensive way to minimize negative environmental impacts, decrease pasture degradation, and prevent large commonly used loafing areas.

Areas frequented by livestock should be located downslope from drinking water wells and an adequate distance upslope from surface water bodies. Nutrients and microorganisms from accumulated wastes and the sediment from disturbed areas can run off into surface waters when filtering and buffering areas are not of a sufficient width to trap them. When heavily used areas are located upslope of wells, nutrients and microorganisms are more likely to contaminate groundwater supplies.

A practice known as *Heavy Use Area Protection* stabilizes agricultural areas that are frequently used by livestock. Land that benefits from heavy use area protection includes but is not limited to land around water troughs, hay rings, mineral feeders, shade areas, and livestock lanes. Heavy use areas are typically protected by 1) grading and leveling the area to provide for surface drainage and prevent ponding of water, 2) removing loose, wet, organic, or other undesirable materials to design specifications, 3) placing *geotextile* over the treatment area, and 4) spreading graded aggregate base (GAB) stone to a minimum depth of 6 inches over the treatment area. Including grading, materials and installation, the approximate cost for heavy use area protection is \$1 to \$1.25 per square foot. Once installed these areas should be maintained by routine inspection, scraping, proper redistribution of animal wastes, and additions of crusher run stone, as needed

Risk of surface water contamination is reduced when sufficient perennial vegetation surrounds heavy use areas. Perennial vegetation minimizes the amount of runoff from the area. Ideally, 50 to 100 feet of perennial vegetation should surround heavily used areas. Water should be prevented from running onto heavy use areas by shaping and grading, and with diversions.

CONFINED PRODUCTION AREAS

Confined production areas, including dry lot feeding and livestock handling areas, should be located

downslope of wells and adequately upslope from surface water bodies. In most situations, a 50 to 100 foot surround of perennial vegetation should be in place around confined production areas to reduce runoff and trap sediment. The distance should be similar in scale to the size of the confinement area. Similar animal waste and soil quality problems can exist when comparing heavy use areas and confined production areas. These problems are slightly intensified with livestock handling areas, but are of particular concern with dry lot feeding areas due to high concentration of livestock in relatively small land areas over an extended period of time.

The animal waste produced in confined production areas has the potential to cause ground water or surface water pollution by *leaching* or runoff. Solid wastes from confined production areas should be collected regularly to prevent build-up of the material. To minimize the risk of environmental contamination, the wastes should be spread and dragged on areas with at least 90% ground cover of perennial vegetation using nutrient management guidelines. (Please see following sections on Nutrient Management Planning.) Percent ground cover can be estimated visually by determining the portion of the soil surface covered by close growing perennial plants. Perennial vegetation is important as it acts to retard surface runoff, trap sediment, and potentially reduce nutrient movement into surface water throughout the year. As cover percentage decreases, so do the beneficial aspects of the ground cover.

STREAMBANK PROTECTION

One of the most controversial issues facing beef cattle producers is fencing to exclude livestock from streams. Preliminary research results indicate that proper placement of alternative water supplies and shade upslope in the pasture can reduce stream use by cattle without fencing. Additionally, rotational use of stream reaches has been demonstrated to protect vegetation and prevent severe erosion of streambanks. Installed gravel or paved *stream crossings* that limit cattle access to managed portions of the stream and streambank have also been shown to reduce streambank degradation.

To visually assess the condition of streambanks first determine the percentage of perennial ground cover existing within a 15 foot distance from the streambank. Also, visually inspect the streambank for manure

deposits and noticeable livestock trails. Continual access to streams and streambanks will likely lead to resource degradation and poor water quality in the immediate area. Consider the voluntary measures of alternative water supply systems, rotational use of the stream, and stream crossings if fencing the stream is not in your plan.

Stream reaches supporting populations of *threatened* and/or *endangered species* should be excluded from livestock use. Contact the U.S. Fish and Wildlife Service, Brunswick, GA, to determine if federally listed species are present on your property. Contact the Department of Natural Resources, Wildlife Resources Division, Social Circle, GA, to determine if state listed species are present on your property.

FARM PONDS

Farm ponds are typically constructed with multi-use livestock and recreational opportunities in mind. Continuous unmanaged use of farm ponds by livestock diminishes the value of the pond for activities such as fishing. Cattle loafing, defecating, and urinating in farm ponds contributes to poor habitat for desirable aquatic organisms. A good indicator of environmental risk for farm ponds is the amount of vegetative cover surrounding them.

Farm ponds provide a valuable source of drinking water for cattle, but the water can actually be provided to cattle using gravity flow or pump systems and watering troughs. Additionally, *watering ramps* constructed into the farm pond and fencing can limit livestock access. Limiting livestock access and maintaining healthy, perennial vegetation around the farm pond margin will minimize negative impacts on it.

WETLANDS

Wetland areas supporting populations of *threatened* and/or *endangered species* should be excluded from livestock use. Changing management from total exclusion to unlimited use of wetland areas increases the potential for adverse environmental impacts. Managing cattle access to wetland areas, i.e. proper timing to utilize forage during periods of seasonal low water table without causing miring or allowing significant loafing, provides producers an opportunity to utilize this forage resource without significant risk to

the environment. In contrast, unlimited cattle access to wetland areas can significantly decrease plant resources that would otherwise stabilize the wetland area. Additionally, manure deposition in wetland areas and miring of the soil due to heavy cattle traffic can negatively impact water quality.

NUTRIENT MANAGEMENT

A *nutrient management plan* is developed to provide guidelines for applying nutrients from commercial fertilizer and animal wastes to meet plant nutrient requirements. Nutrient management plans identify the acreage, location, and crops on which nutrients are applied. Nutrient management plans are based on realistic crop production potential, soil test analysis recommendations for nutrient requirements, and actual nutrient content of animal wastes. Wastes should be analyzed since published values for waste nutrient content are only guidelines, and actual content can vary greatly. Assistance in developing a nutrient management plan can be obtained from your County Extension Agent or NRCS District Conservationist.

Annual or more frequent soil testing provides the most accurate information for developing a nutrient management plan especially when animal wastes are commonly applied. Soil phosphorus can quickly increase from low to high levels when animal wastes are applied based on the nitrogen requirements of the crop. Animal wastes applied to meet crop nitrogen requirements typically contain much more phosphorus than can be utilized by plants during a single growing season.

To reduce nutrient runoff and leaching, nutrients should be applied to forage crops according to their season of growth. Runoff-producing rainfall occurring soon after nutrient application can result in substantial nutrient loss from the field. Timing of nutrient application is critical for plant utilization and environmental protection. Poor nutrient application timing can result in environmental pollution and a reduction in nutrient availability for the forage crop.

Once the correct nutrient application rate is determined by nutrient management planning, applicators are responsible for *calibrating* their equipment to insure the correct amount of nutrients are distributed evenly over the field. Maintaining accurate records of nutrient applications is a good management

practice for all producers. Where significant amounts of animal waste are generated from confined production areas, records of the amount of nutrients produced and how they are distributed should be kept.

Nutrients and animal wastes should not be applied within 100 feet of sensitive areas such as wells, surface water sources, or sinkholes. Nutrients should be applied to vigorous stands of vegetation to ensure good utilization.

PASTURE MANAGEMENT

Long-term persistence of forage species is increased when *minimum grazing heights* are maintained. Minimum grazing heights vary by forage species with prostrate, creeping species sustaining closer grazing than upright, bunch-type species. Once defoliated, forages need time to accumulate energy reserves and initiate new growth before being grazed again. When management allows a rest period, by either rotational stocking or reduced *grazing pressure*, pasture plants tend to maintain more vigorous growth.

On average, stocking rate of pastures should maintain a minimum 3 to 4 inch plant height. Continuous, close grazing weakens the stand, exposes the soil surface to sunlight and the eroding forces of rainfall, and increases the opportunity for weeds to invade.

Animal performance is dependent on the quantity and quality of forage available to them. *Stocking rates* that result in very low available forage result in poor animal performance measured as either gain per animal or gain per acre. The term overgrazing describes this situation. Stocking rates that result in high available forage may result in high gains per animal, but gain per acre falls short as forage is under utilized and animal intake is diminished by poor quality of accumulated forage. The term undergrazing describes this situation. To maximize profitability, producers must achieve an available forage somewhere in the middle of these two scenarios, thereby promoting individual animal performance as well as total animal production for the pasture.

An indicator of a stocking rate that is too high for pasture conditions is the length of time supplemental hay or feed is required. The average hay feeding season in Georgia lasts 120 days. Of course, the hay feeding season can vary tremendously due to extreme weather circumstances. Hay feeding less than 90 days per year

suggests good management of the forage resource, while feeding hay greater than 90 days suggests there is room for improvement in forage management.

Weed invasion is symptomatic of poor fertility, overgrazing, and heavily used areas. While some species considered as weeds can have fairly high forage quality, their productivity is usually not as high as the intended forage species. Additionally, several weed species are extremely invasive, toxic, or are considered noxious. *Pest management plans* that provide guidance on controlling pests by biological, chemical, or mechanical means should be developed to meet the needs of your operation.

NOTES:

NOTES:

ACTION PLAN:

An action plan is a tool that allows you to take the needed steps to modify the areas of concern as identified by your assessment. The outline provided below is a basic guide for developing an action plan. Feel free to expand your plan if you feel the need for detail or additional areas not included. Consult the list of references at the end of this publication if additional assistance is needed to develop a detailed action plan.

Area of Concern	Risk Ranking	Planned Action to Address Concern	Time Frame	Estimated Cost

GLOSSARY:

Beef Cattle Production

Calibration: Adjusting application equipment, travel speed and other factors so as to apply a known amount of material to an area.

Endangered Species: Fish, wildlife or plant species that is in danger of extinction. Normal population growth is not occurring for some reason, usually lack of sufficient habitat.

Geotextile: Term used to describe the multitude of woven or non-woven fabrics designed with specific physical properties for either filtration or soil reinforcement.

Grazing Pressure: Number of animals per unit area of available forage.

Heavy Use Area: An area frequented by livestock and in which animals tend to linger and congregate, such as areas used to provide supplemental feed, minerals and water.

Heavy Use Area Protection: Protecting heavily used areas by establishing vegetative cover, by surfacing with suitable materials, or by installing needed structures.

Leaching: The removal of soluble materials from soils or other material by water.

Minimum Grazing Height: The minimum height to graze forage crops without loss of stand, sacrifice of plant vigor, and reduction of regrowth potential.

Nutrient Management Plan: A specific plan for managing plant nutrient applications for the highest economic benefit and environmental protection.

Perennial: Persisting for several years usually with new herbaceous growth from rhizomes, stolons or other vegetative structures.

Pest Management Plan: A specific plan for managing pests to achieve the highest economic return and prevent environmental contamination. Pest management plans can include biological, chemical, and mechanical control measures.

Runoff: Water that has not moved into the soil but moves across the soil or another surface.

Stocking Rate: The number of animals grazed per unit area, for example, animals per acre.

Stream Crossing: A trail or travelway constructed across a stream to allow livestock or equipment to cross with minimal disturbance to the stream and aquatic environment.

Threatened Species: Fish, wildlife, or plant species that is likely to become endangered within the foreseeable future. Normal population growth is not occurring for some reason, usually lack of sufficient habitat.

Watering Ramp: A facility that will provide livestock limited access to streams or ponds for drinking water.

Contact your natural resources professional for more specific assistance.

REFERENCES:

CONTACTS AND REFERENCES			
Organization	Responsibilities	Address	Phone number
Agricultural Pollution Prevention (P ² AD)	Opportunities for pollution prevention for farmers and others.	Biological and Agricultural Engineering Department, University of Georgia, Driftmier Engineering Center, Athens, GA 30602	706-542-2154
County Extension Service	Information about beef cattle management, livestock working facilities, forage species, and nutrient and pest management planning.	Local county Extension Service	Local - check your local telephone directory blue pages under County Government
Georgia Cattlemen's Association	Unites cattle producers to advance the economic, political and social interests of Georgia's cattle industry.	P.O. Box 24510, Macon, GA 31212	912-474-6560
Georgia Grazing Lands Conservation Coalition	Producer committee with vested interest in assisting grazing lands and livestock managers	355 E. Hancock Avenue, Stop 207, Athens, GA 30601	706-546-2095
Georgia Environmental Protection Division	Questions regarding state regulations on non-point source water pollution	205 Butler Street, SE, Floyd Towers East, Suite 1066, Atlanta, GA 30334	404-657-8831
USDA Natural Resources Conservation Service	Assistance with conservation planning and design of heavy use area protection, watering ramps, stream crossings, grazing systems, pasture planting, riparian buffers, and nutrient and pest management plans	Local county or multi-county Field Office	Local - check your local telephone directory blue pages under U.S. government

PUBLICATIONS:

Georgia Cattlemen's Association
P.O. Box 24510, Macon, GA 31212
912-474-6560

- Georgia Cattlemen, monthly publication issued to Georgia Cattleman's Association members

Potash & Phosphate Institute
655 Engineering Drive, Suite 110
Norcross, GA 30092-2843
770-447-0335

- *Southern Forages*, 2nd Edition, by Donald M. Ball, Carl S. Hoveland, and Garry D. Lacefield - A complete and practical guide to southern forages

State Soil and Water Conservation Commission
P.O. Box 8024
Athens, GA 30603

- Agricultural Best Management Practices for Protecting Water Quality in Georgia

University of Georgia
Cooperative Extension Service
Athens, Georgia 30602

- Animal Waste and the Environment, Circular 827
- Beef Herd Management in Georgia, Bulletin 883
- Georgia's Agricultural Waste Regulations, Circular 819-11
- Land Application of Livestock and Poultry Manure, Leaflet 378
- Management of Small Beef Herds, Bulletin 877
- Pastures in Georgia, Bulletin 573
- Soil Test Handbook for Georgia, June 1989
- Working Facilities for Small Beef Herds, Bulletin 1017
- Your Drinking Water: Nitrates, Circular 819-5

USDA Natural Resources Conservation Service
Local Field Office

- Stream Visual Assessment Protocol, Technical Note 99-1, USDA NRCS, National Water & Climate Center
- Conservation Practice Standards, Field Office Technical Guide, Local Field Office
 - Fencing
 - Filter Strip
 - Forage Harvest Management
 - Heavy Use Area Protection
 - Nutrient Management
 - Pasture and Hayland Planting
 - Pest Management
 - Pond
 - Prescribed Grazing
 - Riparian Forest Buffer
 - Stream Crossing
 - Watering Ramp

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