



Enriching Lives &
Connecting Communities

Natural Resource Management and Environmental Stewardship

Property Management
Policy No. 12072

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Policy Statement

In an effort to provide guidelines for the development and preservation of natural resources on Richland County Recreation Commission properties the plan below describes the steps necessary to accomplish those goals. These guidelines have been developed to assist staff with the future development of new properties and stewardship of properties that offer natural resource management opportunities.

I. OUTLINE OF NATURAL RESOURCE MANAGEMENT PLAN OBJECTIVES

1. Vision for Natural Resource Management; Ecological Principals

- Park management personnel, other county personnel, and key users should establish a clear vision and key principles that inform the decisions necessary to manage both the active-use and conservation areas in parks.
- Consideration should be given of how each use areas should appear and evolve (suspended succession, unmanaged succession, intensity of landscaping, etc.), and how they should function in relationship to other areas in the park.
- Ecological principles should address:
 - Use of pesticides
 - Planting and plant species selection
 - Importing of materials (plants, landscaping, treatments, soils, etc.)
 - Stewardship of natural areas
 - Open space and riparian zones
 - Restoration of natural communities
 - Construction of roads, trails and other right-of-ways
 - Recycling

2. Description of Resources

- Define resources within the park that will be stewarded and managed. Key natural resources include Natural Areas and associated unique or rare species and natural communities, Open Space Reserves, riparian corridors, and geological features.
- Map natural resource areas and the specific resources and identified features contained within those areas (plants, animals, communities, habitats, landscape features, visual/aesthetic resources, etc.).
- Describe specific resources (species, habitats, and natural communities), their values, and their requirements for viability (e.g., a meadow to attract monarch butterflies will need to be of a certain size and contain a sufficient density of food plants).

3. Rules and Permitted Uses

- Define the types of activities allowed within each of the use areas. Generally, Natural Areas and Open Space Reserves should be restricted to passive recreational opportunities that do not require extensive infrastructure, facilities or access. Riparian areas should be defined by vegetative buffers and activities within those areas limited.
- Explain the reasons and need for the rules and restrictions and structure the public interaction goals to make those reasons explicit.

4. Management of Resources

- Provide for the integrity and viability of the park and its natural areas, open space, and riparian resources. Consider setting goals that address the extent, condition, and quality of the key resources. Forest health, water quality, condition of the specific plant or animal populations, and general habitat diversity are all possible focuses around which to develop goals.

5. Public Interaction and Education

- Determine the type and level of public education that the park and its programs will support.

6. Potential Conflicts

- Identify areas of potential conflict between resource management and stewardship, public access and interaction, and outside pressures and circumstances. The issues identified here will help to confirm that the goals set for resources management and public interaction are sufficiently broad and encompassing. These issues will also provide the context that will allow strategies to be created to meet the above.

- Some of conflicts may include deer management, dog walking, vehicular access, perception of maintenance, right-of-way maintenance, etc.

7. Potential Opportunities

- Identify areas of opportunity where resource management, public interaction, and outside pressures and circumstances may reveal opportunities to expand programs, enhance natural resource management, improve park facilities, or assist park management objectives as a whole.
- Categories to consider include: education, regional programs and initiatives, linkages to adjacent and nearby resources, and demonstration areas.

8. Strategies for Achieving Goals

- Outline and discuss how resource management and public interaction will be approached and achieved given the conflicts and opportunities identified and other issues and constraints (e.g., budgetary) that exist.
- Other strategies will develop as the plan is implemented, and those identified here may need to be amended or modified over the course of implementing the Natural Resource Management Plan. Discussion of the strategies should be on-going. Associated strategies included in the natural resource management plan should be reviewed at least annually and updated as necessary.

9. Evaluation of Progress/Success

- Evaluate the progress towards or success in the meeting the goals of the plan.
- Evaluation may be linked to a goal in a number of ways, for example:
 - Numerically (e.g., the number of visitors, number of successful plantings, etc.)
 - By staff or public evaluation (e.g. internal evaluation by staff, survey of public uses, etc.)
 - By area (e.g., number of acres of aggressive exotic species controlled, number of feet of stream-side vegetation established, etc.)
 - By project (e.g., number of projects initiated or completed)
 - By internal program activities (e.g., number of staff trained in exotic plant identification, total staff hours dedicated to resource management, etc.)

All measurements will have some level of subjectivity but more objective measurements will provide a better sense of clarity to the process.

- Evaluation should be initiated at least annually, perhaps seasonally, depending upon the focus of the goal. Staff participation in the evaluation process can be an important tool in directing efforts in resource management and should provide the opportunity for staff to consider their progress and review strategies.

- If evaluation reveals that the goals of the plan are not being met or not advancing as expected, the goals and strategies should be reviewed and updated as necessary to accurately reflect the circumstances and resources at hand.

10. Appendices

- Include all information pertinent to the plan to the resources identified. Reference the overall management plan for the park as necessary to provide context.
- Important information to reference in the appendices may include:
 - Park maps and maps specific to the management of identified resources
 - Resource profiles and references
 - (Flow Chart) or park management and personnel
 - References to other management plans
 - Important contacts

II. RESOURCE MANAGEMENT RECOMMENDATIONS FOR PARK MAINTENANCE MANAGEMENT SYSTEM

A. General guidelines

Educate and train park management personnel at all levels regarding the vision, goals and specific management programs for open spaces, natural areas, and riparian zones.

- Include training in management of special resources (e.g., rare plant populations)
- Provide yearly reviews and site inspections for maintenance staff and training mechanisms for all new staff.

Encourage native vegetation

- Re-vegetate using only plants native to central South Carolina.
- Where possible, establish nurseries for future planting needs and material.
- Seek out plants and seeds from local stock (local genotypes) and identify reliable sources for such material.
- Consider warm season grasses for all non-intensive use areas.

Provide vegetated buffer strips along all watercourses.

- Include perennial and intermittent streams and temporary drainage ways (e.g., swales and channel scars).
- Allow natural succession to occur on banks and slopes and provide planting where necessary to establish vegetated riparian zones.

Control aggressive exotic species

- Identify and prioritize critical action areas.
- Define management approaches for each exotic species and for each population unit or management unit.
- Set management goals and evaluation procedures for control programs.
- Ensure that landscaping materials imported into the parks do not contain (excessive) exotic or weedy species seed or propagates. Emphasize locally manufactured and supplied materials.

Maintain or increase forest cover in natural areas

- Limit cutting and trimming of trees to the minimum required for safety.
- Limit and consolidate any necessary right-of-ways (roads, utilities, etc.).
- Plant areas of degraded woodland or areas that have experienced substantial mortality if natural regeneration is not occurring or providing too little recruitment.

Keep biomass within the system

- Do not remove cuttings (including grass), trimmings or tree/branch falls in conservation areas.
- Allow snags and dead limbs to stand in conservation areas if they do not impose an imminent safety hazard

Minimize the use of chemicals in landscape maintenance.

- Confine herbicide use to the control of invasive exotics under the specific management programs for these species.
- Consider exotic control programs that emphasize persistent, focused efforts from staff and volunteers.
- Avoid mass application of all pesticides, including organic pesticides. Consider biological and mechanical methods of control.
- Consider use of local leaf mulch and composted manure for landscaping treatments.
- Limit the use of chemical fertilizers.

Maintain “soft” edges where ever possible.

- Buffer woodlands with borders maintained as old field or low shrub cover to create wildlife habitat and introduce alternative aesthetics.
- Develop successional perimeters along field edges, right-of-ways, and active-passive use area boundaries.

Maintain trails and pathways with mechanical means.

- Consider mulching, fabric or plastic barriers, occasional cultivation and periodic hand clearing, trimming, and weeding to maintain trails.
- Utilize best management practices for trail systems. Reference maintenance procedures from organizations such as the Keystone Trails Association, Appalachian Mountain Club, or Green Mountain Club.

Re-evaluate mowing practices.

- Consider less intensive mowing for lightly used areas.
- Establish grassy meadow areas with wildflowers for habitat value, to be mowed on an annual basis.
- Schedule mowing to minimize impacts on wildlife.
- Consider appropriateness of equipment to the area being mowed to reduce impacts on environmentally sensitive areas (steeply sloped, wet soils, etc.)

A. Strategies for Establishing Boundaries for Conservation Areas

Delineate, describe and map Open Space Reserves, Natural Areas, riparian zones, and other specific management areas and their boundaries.

- Provide sufficient detail to allow uniform and accurate interpretation of the boundaries.

- Make use of aerial photographs and general photographs to convey ideas and show boundaries
- Consider establishing permanent markers for re-survey or mapping of areas.

Educate and train park maintenance staff in the approaches, techniques, and rationale for the creation and maintenance of Natural Area, Open Space Reserve, and riparian habitat boundaries.

- Assure that all park maintenance staff can identify management units within the naturalized sections of the park.
- Assure that new staff receives prompt instruction and training.

Provide clear, compelling signage to inform the public of the resources, management approaches, and maintenance activities within Open Space Reserves and Natural Areas.

- Place signage strategically at crucial interfaces with trail systems and high use areas

Use plantings to define use areas.

- Shrub borders, tall grass areas, pathways lined with native grasses, and slopes planted in dense, minimally maintained vegetation all suggest uses to the public and give visual cues to maintenance staff regarding management units and boundaries.

Utilize temporary fencing to help vegetation borders become established and to reinforce desired maintenance behaviors and patterns.

- Some boundary areas may require seasonal fencing to establish use patterns that will eventually be autonomous.

Orient active-use areas to minimize expansion of activities across boundaries and to avoid creating convenient and frequent traffic between active-use and conservation areas.

- Use plantings, signage, trail sinuosity, and topographic features to help define a gradient of use levels moving from active to passive-use areas.

OUTLINE OF TRAIL MANAGEMENT PLAN GUIDELINES

Trail Location and Placement Guidelines

- Sensitivity to Natural and Cultural Resources
- Trails within Floodways
- Scenic, Cultural, and Recreational Value
- Adjacent Farmland
- Adjacent Commercial/Residential/Industrial Land
- Railroad Corridors
- Road Rights-of-Way
- Utility Corridors

Trail Design Guidelines: Resource Management Zones

- Natural Areas
- Open Space Reserves

Trail Design Guidelines: Use Modes

- Hiking/Walking Trails
- Pedestrian Trails
- Bicycle Trails
- In-Line Skating Trails
- On-Road Bicycle Facilities
- Mountain Bike Trails
- Equestrian Trails

Trail Design Guidelines: Multi-Use Corridors

- Single-Tread way Corridors (have only one trail planned to accommodate all desired modes).
- Dual-Tread way Corridors (accommodate a variety of modes on two or more different trails)

Design Guidelines for Crossings

At-Grade Crossings

- Crossing Layout
- Sight Lines
- Signage, Striping, and Signals
- Roadway Crossings
- On-Road Bicycle Facilities at Intersections
- Railroad Crossings
- Agricultural Crossings
- Crossings of Other Trails

Grade-Separated Crossings

- Roadway Underpasses

- Agricultural Underpasses
- Roadway Overpasses
- Bridges over Watercourses and Other Independent Trail Bridges
- Wetland Boardwalks

Support Components

- Trailheads and Access Point
- Rest Areas
- Interpretive Facilities
- Signage

Operations and Maintenance

- Roles and Responsibilities
- Permitted Uses
- Snow Removal
- Seasonal Maintenance
- Cooperative Maintenance Agreements
- Use of Volunteers
- Evaluation of Trail Conditions
- Recommended Frequency of Maintenance

Prioritization

- Short-term Objectives
- Medium-term Objectives
- Long-term Objectives

Funding

- Financing Strategies
- Grant Opportunities
- Volunteer Use

The trail management plan should be developed utilizing current trail planning resources, guidelines and recommendations, including:

- The “Guide for the Development of Bicycle Facilities,” published by the American Association of State Highway Transportation Officials. This document is generally recognized for establishing the design requirements for shared roadways, paved shoulders, bike lanes, shared use paths, bike turning lanes, bike lanes at intersections, bike lane symbols, and many other items that must be considered.
- “The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual”, 1998 and the “Development of the Bicycle Compatibility Index: A Level of Service Concept, Final Report,” 1998, published by the Federal Highway Administration (FHWA)

Based on extensive research, the FHWA's Bicycle Compatibility Index is a system to determine a roadway segment's ability to accommodate the average adult bicyclist. It is a useful reference for use in planning on-road bicycle facilities.

III. OUTLINE OF WATERSHED AND STORMWATER MANAGEMENT PLANS

A. Watershed Management Plans

The key elements of a watershed management plan include evaluating the ability to manage runoff, identifying potential contaminant sources, developing plans to improve water quality, and producing a beneficial watershed-planning tool. The tool would be used to 1) define the most appropriate mitigation strategies to address water quality issues and 2) to outline an implementation program. Developing a watershed management plan typically includes the following steps:

Step 1: Establish Watershed Management Goals

Step 2: Perform a Watershed Inventory

Step 3: Conduct Contaminant Assessment

Step 4: Develop Source Protection Strategies

Step 5: Develop and Implement a Watershed Management Plan

Step 1: Establish Watershed Management Goals

The first step in developing a watershed management strategy is to establish the watershed management goals. The goals provide guidance throughout the project by providing direction and answering the question, "What are we trying to accomplish?" Goals can relate to erosion prevention, water quality protection, cost considerations, regulatory requirements, and other land use considerations. Whatever the goals and objectives may be, it is useful to develop a primary goal statement and achievable objectives. The primary goal statement broadly states the intent of the management plan. The achievable objectives focus on specific solutions. Together these elements determine balanced qualitative or quantitative goals. The basic goals for a watershed will greatly affect the choice of management strategies.

As part of establishing goals, the person(s) preparing the plan will need to identify and address concerns about the water and other natural resource systems, local economy, and social structure. All concerns will need to be explored to see if there is, in fact, a real problem.

The preparer should establish a unique set of goals for each park's watershed.

Step 2: Perform a Watershed Inventory

The purpose of a watershed inventory is to become familiar with the watershed and the problems that it faces. Each watershed has its own characteristics and related water quality concerns. A watershed inventory delineates the watershed boundary and examines the natural characteristics, land uses, and water quality within the watershed.

The primary natural characteristics to investigate include topography, geology, climate, vegetation, hydrology, wildlife, and land use. Relating terrain, soils, vegetation, and hydrology, for example, is useful in evaluating runoff and erosion potential. Knowing the major land uses, land ownership, and population centers provides insight on the type of activities that are supported by the watershed. These factors relate both directly and indirectly to water quality impacts. Land use information can be ascertained from county and municipal general plans,

regulatory agency files, agricultural and other existing reports, field surveys, and aerial photography.

The maps and information may include the following:

- Boundaries
- Terrain
- Water Bodies
- Soil types
- Roads
- Land uses
- Recreational uses
- Fish and game surveys
- Development trends

As part of the inventory, critical areas (ones that have the greatest impact to water quality) should also be identified at this stage. Determining critical areas can be done by examining the landscape. Critical areas can include:

- Areas next to a stream or lake
- Water supply locations
- Recreational areas
- Fragile wildlife habitats
- Unstable stream banks
- Shallow groundwater

Step 3: Conduct Contaminant Assessment

The contaminant assessment determines the vulnerability of the source water by identifying existing and potential pollutant sources and estimating impacts to water quality. Potential contaminant sources include both point and non-point sources such as:

- Wastewater discharges
- Urban runoff
- Agricultural crop land use
- Grazing
- Concentrated animal facilities
- Solid waste disposal facilities
- Recreational use
- Traffic accidents/spills
- Fires

The extent to which an activity may impact a water source can be evaluated by various methods that range in complexity. Evaluation methods may include physically based modeling, empirical modeling, decision analysis, and best professional judgment. The best evaluation method selected should suit the available data, cost, and resources. Computer models are more complex and can

handle a large amount of information to estimate the water quality impacts of different scenarios. Best professional judgment, on the other hand, is more simplistic and involves the evaluation of existing data by experienced professionals to determine the significance of existing and potential impacts and the best protection strategies to mitigate impacts.

Whatever the selected evaluation method, it should be appropriate to the purpose of the watershed management plan and the available data and resources. As an example, computer models are only as good as the input data and assumptions. Therefore, if little data is available best professional judgment may be a more appropriate evaluation method.

After the completion of Step 3 for each of the park's watershed, the preparer should assess the need for Steps 4 and 5. If an individual park has existing or future problems or concerns that should be addressed, then Steps 4 and 5 should be undertaken. Otherwise, the preparer should document findings from Steps 1, 2 and 3, conclude that protection strategies are not required, and make recommendations regarding future reassessments of the watershed.

Step 4: Develop Source Protection Strategies

Once the goals of the watershed management program have been determined, the watershed has been characterized, and contaminant sources have been evaluated, the appropriate source protection strategies can be determined. Source protection strategies, or best management practices, are a means of mitigating contaminant sources. The source protection strategies should focus on key watershed activities and constituents of concern to protect water quality. Source protection approaches may include both non-structural and structural control strategies.

Non-structural controls utilize planning, regulatory policies, and land ownership to minimize threats to water quality. Structural controls include capital improvements designed to detain or divert contaminants in surface runoff. Structural controls focus on removing contaminants that have entered runoff and removal efficiencies can be measured, but these controls require maintenance and can have high capital costs. Non-structural controls focus on minimizing the sources of contaminants and are usually not costly to implement, but it can be difficult to quantify removal rates.

The following are typical examples of structural and non-structural controls:

Structural Controls

Detention ponds (wet and dry)
Diversion systems
Contour strips
Alternative livestock watering sources

Terraces
Roadside erosion control
Private/rural road maintenance
Stream bank stabilization
Constructed wetlands

Non-Structural Controls

Conservation tillage
Construction site erosion control
Filter or buffer strips
Reduced dumping of oil and/or
chemicals into storm sewers
Nutrient Management
Pest management
Tree plantings
Irrigation water conservation
Home water conservation
Septic system maintenance
Storm water management plan

Rotational grazing

Riparian zone management

Step 5: Develop and Implement a Watershed Management Plan

The actual results of a watershed plan in terms of maintaining or improving water quality rely on how well the plan is implemented and monitored. Implementation requires ownership of the plan, financing, stakeholder involvement or consent, and long-term monitoring.

A long-term monitoring program is essential to the management plan as a means to review and evaluate progress. The plan is a dynamic process and goals should be revisited periodically to address changes in watershed activities, water quality, and effectiveness of source protection strategies. Modifications in the plan may be necessary to address these changes. These modifications can be made to the existing plan or may indicate the need for a watershed management plan for a park that previously had no plan.

B. Storm water Management Plans

As a portion of the watershed management plan, a separate storm water management plan should be developed for the parks system that would address the system as whole and specific elements of the individual parks.

Storm water is pure rainwater plus anything the rain carries along with it. In urban areas, rain that falls on the roof of a house, or collects on paved areas like sidewalks, driveways, roads, and parking lots, is conveyed to the receiving stream through a series of underground pipes.

Objective

The objective of the storm water management plan should be to manage the water resources of the park to:

- Prevent future flooding/drainage damage
- Minimize existing flooding/drainage problems
- Preserve the natural and beneficial functions of the natural drainage system
- Preserve and enhance storm water quality
- Minimize erosion problems

Process

A typical storm water planning process includes the following steps:

- Define management objectives for existing and proposed areas
- Inventory of the current situation, including assets. Limitations, and applicable regulations
- Identify the problems and preferred level of service
- Develop and examine alternative actions, along with their costs and benefits
- Determine the financial capability to implement actions
- Select a set of actions
- Schedule and implement the plan

- Develop a monitoring program to assess the effectiveness of the plan and identify any necessary refinements
- Develop a program for revisiting the plan

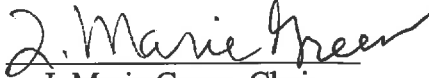
Key Elements

The key elements of the storm water plan are:

- Significant input should be sought from those most familiar with the parks, such as park managers and employees, users, and engineers.
- The planning team should include planners, environmental scientists, economists, engineers, hydrologists, and other professionals as dictated by the needs of the community. Transportation, water quality, wildlife, and historic preservation are issues in some of the parks. From beginning to end, having more people involved in the process will improve the plan.
- The plan should be formally adopted.
- Recommendations for capital expenditure should be integrated into the capitol improvements plan.
- The plan should encompass each of the parks in their entirety.
- The storm water plan should include a technically and economically acceptable rainfall/runoff model. This model should be calibrated with actual rainfall and runoff events to ensure that it will produce reasonably accurate predictions of runoff events from hypothetical rainfall events. A registered engineer or similar professional should produce technical elements of the plan.
- The rainfall/runoff model should be calibrated for a range of storms from relatively minor events, such as a 6 month event, up to major storms, such as the 500-year event. It is not likely that a community will regulate new development or design structures for these very large events, but it should be aware of the problems it will face when they occur.
- The plan should anticipate the impact of all expected development for the longest possible planning threshold within the drainage basin.
- The plan should be integrated with other plans, including the watershed management plan (of which it is a subset). This plan may provide for the preservation or improvement of environmental quality, open space, and other amenities.
- The plan should examine a wide range of regulatory and structural components that will lead to the correction of existing problems and prevent the creation of new problems. A combination of regulation of future development, acquisitions and demolition or relocation of some flood-prone structures, retention or detention facilities, and channel improvements are usually required if the current problems are severe.
- Finally, the plan should produce recommendations that can and will be implemented. These should reflect a level of service for “10-, 25-, or 100-year protection” that is required and is practical for implementation. There is no value to a plan or its components if they cannot be implemented.

ADOPTED BY RICHLAND COUNTY RECREATION COMMISSION BOARD

BOARD MEETING DATE: November 18, 2013
(Date Approved)

APPROVED: 
J. Marie Green, Chair

For more information about this policy, contact the Executive Department.