Johns River and South Mountains Game Lands Management Plan

2018-2027

NORTH CAROLINA Wildlife RESOURCES COMMISSION

North Carolina Wildlife Resources Commission staff contributed extensively to the development and preparation of this plan through their various fields of professional expertise. All content, management strategies, recommendations, goals, and needs for change were developed using the best available science and professional working knowledge of Johns River and South Mountains Game Lands, including their habitats, and terrestrial and aquatic species. Careful consideration has been given to all input received from the public, external agencies, and organizations that have an interest in or use the game land to ensure that a comprehensive management program is administered on these game lands. The successful implementation of the plan will depend on the continued feedback and support from all interested parties.

PLAN COLLABORATIVE TEAM MEMBERS

- **Brandon Bridges**, Conservation Technician I, Morganton Depot, Land and Water Access Section
- **Jason Creegan**, Conservation Technician II, Morganton Depot, Land and Water Access Section
- **Mark Hamlett**, Engineer, Engineering Section
- **Kip Hollifield**, Mountain Ecoregion Supervisor, Land and Water Access Section
- **Ryan Jacobs**, Mountain Ecoregion Wildlife Forester, Land and Water Access Section
- **T.R. Russ**, Western Aquatic Nongame Biologist, Division of Inland Fisheries
- **Nick Shaver**, Northern Mountains Technician Supervisor, Land and Water Access Section
- **Dean Simon**, Mountain Ecoregion Wildlife Forester, Land and Water Access Section, (retired)
- **Phillip Tallent**, Sergeant, Division of Enforcement
- **Paul Thompson**, Northern Mountains Land Management Biologist, Land and Water Access Section
- **Gordon Warburton**, Mountain Ecoregion Supervisor, Land and Water Access Section**,** (retired)
- **Kendrick Weeks**, Mountain Wildlife Diversity Supervisor, Division of Wildlife Management
- **Chris Wood**, District 8 Fisheries Biologist, Division of Inland Fisheries
- **Justin Yale**, Conservation Technician I, Morganton Depot, Land and Water Access Section

EXECUTIVE SUMMARY

Johns River Game Land (JRGL; 3,892 acres) is located in Burke County, while South Mountains Game Land (SMGL; 21,647 acres) is located within the South Mountains in Burke, Cleveland, McDowell and Rutherford Counties. Both game lands are owned by the State of North Carolina and the North Carolina Wildlife Resources Commission (NCWRC) is the primary custodian. Johns River Game Land was acquired 2006 through 2007. The original purchase for SMGL was made in 1954 (90 acres), however the primary acquisition was made in 1998 (+/- 17,000 acres). Additional tracts have been acquired at SMGL through 2010. Both game lands are popular with hunters and wildlife watchers in addition to other outdoor recreational enthusiasts such as hikers. Important game species include deer, wild turkey, dove, waterfowl (JRGL only) and other small game species. Johns River Game Land is 86% forested with dry oak-pine and managed pine forests predominant. South Mountains Game Land is 76% forested with oak forests predominant. Approximately 24% of SMGL is maintained in early successional habitat via the Cooperative Upland Habitat Restoration and Enhancement (CURE) Program. Thirty six state endangered, threatened, or rare species are found on SMGL and 1 on JRGL. Management goals for both game lands include maintaining and/or restoring a diversity of habitat types and forest age classes through science-based land management to ensure that a diversity of wildlife species are conserved, maintaining popular sport fish and game species at appropriate levels, providing quality habitat for endangered, threatened, and rare species, and providing sufficient infrastructure and opportunity to allow all constituents a quality experience while utilizing the game lands with minimal habitat degradation and minimal conflict among user groups. To ensure these goals are met, the NCWRC will monitor wildlife and fish species and users of both game lands, secure funding to accomplish management goals, acquire additional key properties as they become available, maintain and develop regulations that promote sustained use of natural resources, and develop relationships with conservation partners that help meet management goals.

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INTRODUCTION

Game Land Program Mission Statement

Consistent with the original establishment legislation (G.S. 143-239) for the North Carolina Wildlife Resources Commission (NCWRC), the mission of the game lands program is to enhance, facilitate, and augment delivery of comprehensive and sound wildlife conservation programs. Inherent in delivery of a land conservation program consistent with this mission is the feasibility and desirability of multiple uses on lands owned by the state within the system. In addition to hunting, fishing, trapping, and wildlife viewing as primary uses, we recognize the desirability of providing opportunities for other activities on state owned game lands that are feasible and consistent with the agency's mission and compatible with these traditional uses.

Game Land Program Management Objectives

- To provide, protect, and actively manage habitats and habitat conditions to benefit aquatic and terrestrial wildlife resources
- To provide public opportunities for hunting, fishing, trapping, and wildlife viewing
- To provide for other resource-based game land uses to the extent that such uses are compatible with the conservation of natural resources and can be employed without displacing primary users
- To provide an optimally sustainable yield of forest products where feasible and appropriate as directed by wildlife management objectives

Game Land Program History

Prior to 1971, public hunting areas in North Carolina were limited to designated and tightly controlled Wildlife Management Areas. With the Wildlife Management Area system, NCWRC staff was housed on each management area. These personnel were assigned both law enforcement and habitat management duties on their respective areas. Most of these management areas are our current bear sanctuaries.

The current Game Lands Program was established in 1971. This change involved expanding the area of game lands from about 700,000 acres to 1.5 million acres, changing regulations, and reducing fees for hunters and fishermen (Dean 1971). The old Wildlife Management Areas were incorporated into the new Game Lands Program, but the new program also allowed NCWRC to lease or incorporate additional lands as game lands to expand the land base. Beginning in the 1980's, land owners (both corporate and private) realized they could lease their properties for higher rates to hunting clubs and private individuals and began to remove their

properties from the Game Lands Program. Fortunately, the Natural Heritage Trust Fund was established in 1987 and the Clean Water Management Trust Fund in 1996. These funds provided money for the fee simple acquisition of select properties, many of which have been incorporated into the Game Lands Program. These Funds greatly compensated for the loss of game lands leased from the private sector. Currently, approximately 2 million acres are enrolled in the Game Lands Program.

Administration of the new Game Lands Program was assigned to the Division of Wildlife Management. Depot locations with equipment and habitat development crews were established and strategically located in the vicinity of all game lands in the state. All law enforcement on these properties was assigned to the new Division of Law Enforcement. With some minor organizational changes this system remained intact until 2012. In 2012, land management staff in the Division of Wildlife Management and certain similar positions in the Division of Inland Fisheries were merged with Division of Engineering staff into the Division of Engineering and Lands Management. This organizational change was made to deliver a more comprehensive and efficient wildlife and fisheries management program on all public lands and waters in the state. Depots remained at former locations with the establishment of new depots and crews at certain remote locations to improve the efficiency of NCWRC programs.

PURPOSE AND NEED FOR PLAN

A comprehensive game land management plan is needed for Johns River (JRGL) and South Mountains Game Land (SMGL) to implement the NCWRC Strategic Plan and accomplish game land program objectives in a timely and efficient manner. In addition, the NCWRC created the North Carolina Wildlife Action Plan (NCWAP) which provides direction for those species which are not typically hunted or fished (N.C. Wildlife Resources Commission 2005). This plan is currently undergoing revision, which is expected to be complete in 2015. A management plan for the CURE area of SMGL was written in 2004 (Appendix II) but this only covers a portion of the game land. Finally, both game lands are used by both traditional and other recreational users leading to a need to address any potential opportunities or conflicts among user groups. It is therefore timely to address new challenges and opportunities with a comprehensive game land management plan for these game lands.

The JRGL/SMGL management plan was developed with input from NCWRC staff as well as input from interested external agencies, organizations, and individuals to ensure a comprehensive management program is administered on both game lands. The successful implementation of the plan will depend on the continued feedback and support from all staff and stakeholders. This management plan will focus on a 10 year planning horizon. NCWRC staff will review and amend the plan as needed.

REGIONAL CONTEXT

Mountain Ecoregion/Northern Mountains Work Area

Both JRGL and SMGL lie within the NCWRC Mountain Ecoregion and the Northern Mountains work area (Appendix 1, Map 1). This work area includes 20 counties or portions of counties within the Blue Ridge Mountains and along the transition zone between the Blue Ridge Mountains and the Piedmont. Approximately 4,200 mi^2 of the work area lies within the Blue Ridge physiographic province (Griffith et al., 2002). The remaining 2,690 mi^2 are contained within the Piedmont physiographic province. The work area contains portions or all of the following river basins: Broad (998 mi^2), Catawba (1,594 mi^2), French Broad (1,433 mi^2), New (753 mi^2), Roanoke (15 mi^2), Watauga (205 mi^2), and Yadkin (1,901 mi^2). The work area contains 13 game lands consisting of approximately 415,991 acres. Approximately 97% of game land acreage within the work area is contained in the Blue Ridge physiographic province, with the remainder in the Piedmont province (Griffith et al., 2002; Appendix 1, Map 1).

The State of North Carolina, with the NCWRC as the primary custodian, owns in fee simple 67,260 acres of game lands within the Northern Mountains work area. Approximately 324,686 acres of game lands within the work area are owned by the USDA Forest Service and managed as game lands under a cooperative agreement (MOU). The remaining 1,242 acres of game lands are leased from other governmental agencies or the private sector. The work area also contains 13 public boating access areas, 50 public fishing access areas, and 3 fish hatcheries. Depots within the work area are located in Burnsville, Marion, Morganton, and Wilkesboro (Appendix 1, Map 1). Seventeen permanent staff, under the direction of an Ecoregion Supervisor, are stationed in the Northern Mountains work area. Two wildlife foresters also serve the Mountain Ecoregion.

Regional Conservation Partnerships

The Game Lands Program is vital to many conservation efforts and partnerships within the Mountain Ecoregion. The NCWRC enjoys a long standing alliance with the USDA Forest Service to cooperatively manage wildlife on the National Forests. The Natural Heritage and Clean Water Management Trust Funds along with the N.C. Ecosystem Enhancement Program have all provided significant and critical funding for the acquisition of key properties that have been added to the Game Lands Program. The Natural Heritage Trust Fund was repealed by the N.C. General Assembly in 2013 and their funds are now administered through the Clean Water Management Trust Fund. Many of the properties acquired with these funding sources have been established as or have enhanced existing State Natural Heritage Areas and/or have been dedicated as Nature Preserves by the N.C. Natural Heritage Program (NHP). Many nonprofit land conservancies within the ecoregion, such as Blue Ridge Conservancy, Piedmont Land Conservancy, Foothills Conservancy of N.C., Pacolet Area Conservancy, Conservation

Trust for N.C., Southern Appalachian Highlands Conservancy, The Conservation Fund, The Trust for Public Land, and The Nature Conservancy have all played vital roles to acquire properties that have been added to the Game Lands Program and to establish landscape level conservation areas. Other conservation partnerships that are important for the Game Lands Program include the United States Forest Service (USFS) Southern Research Station, North Carolina State University (NCSU), Western Carolina University, Clemson University, University of Tennessee, the Southern Blue Ridge Fire Learning Network, the Ruffed Grouse Society, Quality Deer Management Association, National Wild Turkey Federation, Trout Unlimited, Partners in Amphibian and Reptile Conservation, Partners in Flight, Appalachian Mountains Joint Venture, Eastern Brook Trout Joint Venture, and the Appalachian Landscape Conservation Cooperative.

GENERAL GAME LANDS INFORMATION

Location

JRGL (3,893 acres) and SMGL (21,647 acres) are located in the east-central portion of the work area (Appendix 1, Map 1). Johns River Game Land lies entirely within Burke County. The majority of SMGL lies within Rutherford County (70%), with the remainder divided among Burke (15%), Cleveland (12%), and McDowell (3%) Counties. Morganton is immediately adjacent the southern boundary of JRGL, is 2 miles north of the Leonard Farm and Black Fox tracts of SMGL, and is the nearest town to these properties (Appendix 1, Map 2). The nearest towns to the larger Rollins tract of SMGL is Rutherfordton/Forest City, which is located approximately 11 miles to the southwest and Morganton, which is located approximately 7 miles to the north. Several public roads, maintained by the North Carolina Department of Transportation (NCDOT) either traverse or are immediately adjacent both game lands.

Approximately 2,357 acres of JRGL have been dedicated by the N.C. Natural Heritage Program as the Johns River Game Land Dedicated Nature Preserve (Appendix 1, Map 3) (Appendix 3). Approximately 18,933 acres of SMGL have been dedicated by the N.C. Natural Heritage Program as the South Mountains Game Land Dedicated Nature Preserve (Appendix 1, Map 4) (Appendix 3).

Physical Attributes

Johns River Game Land lies within the Catawba River Valley near the confluence of the Johns and Catawba Rivers at the upper end of Lake Rhodhiss. The game land lies entirely within the Piedmont physiographic province (Appendix 1, Map 1). The topography is gentle to moderate, with broad, flat ridges in the uplands and flat bottomland along the typically slow moving streams located on the property (Appendix 1, Map 5). Elevation generally ranges from 1,000 – 1,200 ft.

South Mountains Game Land is part of the South Mountains which are separated from the main Appalachian chain by the Catawba River valley. Almost all of the game land lies within the Blue Ridge physiographic province, with only an insignificant portion in the Piedmont province (Appendix 1, Map 1). Most of SMGL consists of steep ridges drained by small, fast flowing streams (Appendix 1, Map 6). Elevation on SMGL ranges from nearly 3,000 ft. along the spine of the main ridge line to 1,200 ft. at the lowest elevations.

Climate

The climate for both game lands is classified as humid subtropical ("Köppen-Geiger Climate Zones of the Continental United States", 2014). Normal monthly mean temperature in Morganton is 57°F (State Climate Office of North Carolina, 2014). Normal monthly minimum temperature occurs in January (24.9°F) and normal monthly maximum temperature occurs in July (88.7°F; State Climate Office of North Carolina, 2014). Average annual precipitation is 49.6" and is generally well distributed throughout the year (State Climate Office of North Carolina, 2014). Snowfall averages 3.9" annually (Current Results, 2014). Average annual last spring frost date in Lenoir is April 14 and first average annual fall frost date is October 23 (Ray's Weather Center, 2014).

It should be noted that these climate and weather parameters are for Morganton/Lenoir, NC (elevation 1,200 ft.). Some elevations at SMGL are significantly higher than this, thus average temperatures are likely lower and average rainfall and snowfall greater at these higher elevations than in Morganton/Lenoir.

Soil

Nine soil types have been identified on JRGL and 30 on SMGL (Soil Survey Staff, 2014). The soils on JRGL can generally be classified, however, as loam (<1%), sandy loam (37%), sandy clay loam (60%), and loamy sand (2%), or water (<1%) (Soil Survey Staff 2014) (Appendix 1, Map 7). At SMGL the soils can generally be classified as loam (<1%), clay loam (<1%), sandy clay loam (6%), sand (<1%), sandy loam (93%), or water (<1%) (Soil Survey Staff 2014) (Appendix 1, Map 8). Although soil erosion potential varies among soil types the potential for

soil erosion should always be evaluated when disturbing the soil or making management decisions.

Hydrology

Johns River Game Land lies entirely within the Catawba River Basin, which includes 3,285 square miles in North Carolina. Due to location and topography most streams on JRGL are slow moving. Johns River serves as the game land boundary for 2.9 miles and flows directly through the game land for 2.0 miles. Catawba River serves as the game land boundary for 1.25 miles. Other notable streams on the game land include Lower Creek (4.3 mi.) and Bristol Creek (1.4 mi.).

Johns River, Johns River Game Land.

Most of SMGL lies within the Broad River Basin (86%) with the remainder in the Catawba River Basin. South Mountains Game Land contains approximately 80 miles of streams. Notable streams located on the game land include Little First Broad and North Fork First Broad rivers; Beaverdam, Brier, Grayson, Hunting, Negro, Pheasant, Roper, Sally-Queen, and Silver creeks; and Johanna, Pots, and Sudlow branches. Due to their location and steep topography, most streams on the game land are generally small and fast flowing.

History

Johns River Game Land

Prior to acquisition by the State of North Carolina the current JRGL was owned by Crescent Resources, LLC, which was the land management division of Duke Energy. The property was managed as an industrial forest and leased to hunt clubs.

In 2006 the State acquired the 1,001 acre Loop Road Tract with grants from the Natural Heritage Trust Fund (NHTF) and the Clean Water Management Trust Fund (CWMTF). In 2007 the 2,892 acre Lower Creek Tract was acquired with a grant from the CWMTF and per the Federal Energy Regulatory Commission (FERC) relicensing agreement for operation of hydroelectric dams by Duke Energy on the upper Catawba River.

These tracts were entered in the Game Lands Program in fall 2007 as JRGL.

South Mountains Game Land

The original purchase for SMGL was a 90 acre tract acquired by the State in 1954. This tract was supplemented by various leased tracts through the years, none of which are currently enrolled in the Game Lands Program. In the early 1990s the 533 acre Black Fox and the 326 acre Leonard Farm tracts (Appendix 1, Map 2) were reallocated from the N.C. Department of Agriculture and Consumer Affairs to the NCWRC and became part of SMGL.

The approximately 17,000 acre Rollins Tract was purchased in 1998 with grants from the CWMTF and NHTF as well as an allocation from the N.C. General Assembly and funding provided by the NCWRC (Appendix 1, Map 2). This acquisition became the cornerstone of the present SMGL. General assistance with this acquisition was provided by The Nature Conservancy and Foothills Conservancy of N.C. Other acquisitions detailed in Table 1 below have supplemented this purchase. These acquisitions served to enhance public access, remove private inholdings or irregular property boundaries, or served to enhance wildlife habitat in and around the Rollins Tract. General assistance with acquisition for most of these subsequent purchased properties was provided by Foothills Conservancy of N.C.

Table 1. Land acquisitions, SMGL, 2000-2010. (NHTF – Natural Heritage Trust Fund, CWMTF – Clean Water Management Trust Fund, EEP - N.C. Ecosystem Enhancement Program)

Tract	Acquisition Year	Acres	Funding Sources
Fox	2000	21	NCWRC
Davidson College	2001	230	NHTF
Bollinger Gap	2003	78	NHTF
Norman	2003	71	NHTF
Bolin Knob	2004	466	NHTF
Lone Mountain	2004	1,245	NHTF, CWMTF, EEP
Marion Carter	2006	1,858	NHTF, CWMTF
Terry	2010	230	NHTF

Habitats

Approximately 86% of JRGL is forested. The remainder of JRGL is comprised of various types of early successional habitat (8%), row crops (2%), developed areas along highways (3%), and other (1%). In general, significant forest types on the game land are as follows: pine (3%), dry oak-pine (32%), floodplain (5%), managed pines (45%), and mesic (1%) (N.C. State University 2008). The managed pines were planted by the former landowner and will be restored to site appropriate habitats after they reach merchantable size. Important habitat types defined by the NCWAP and found on JRGL include riverine aquatic communities, bogs and small wetland communities, floodplain forests, early successional, oak forests (dry oak-pine), and pine forest (N.C. Wildlife Resources Commission, 2005) (Appendix 1, Map 9). Each of these habitat types will be discussed in greater detail in subsequent sections.

Approximately 76% of SMGL is forested. In general, significant forest types on the game land are as follows: cove (11%), pine (4%), and oak (60%) (N.C. State University 2008). Approximately 24% of SMGL is maintained in various types of early successional habitat. This early successional habitat was created either as part of a timber sale conducted by the former landowner immediately before and a few years after State acquisition or was established by NCWRC as part of the Cooperative Upland Habitat Restoration and Enhancement (CURE) Program, which was implemented on SMGL in 2004 (Appendix 1, Map 2) (Appendix 2). Large portions of game lands in the CURE program are managed for generally declining wildlife species that rely on various types of early successional habitat for their existence. Important habitat types defined by the NCWAP and found on SMGL include riverine aquatic communities, bogs and small wetland communities, oak forest (including dry oak-pine), pine forest, cove forest, early successional habitat, and rock outcrops (N.C. Wildlife Resources Commission, 2005) (Appendix 1, Map 10). Each of these habitat types will be discussed in greater detail in subsequent sections.

Surrounding Land Use

Land use surrounding both JRGL and SMGL is similar to that found throughout the foothills region. An analysis of SEGAP data indicates the following conditions within a 5 mile radius of these game lands: developed – 5%, pasture/hay – 7%, row crops – 1%, non-industrial forest – 63%, industrial forest – 12%, grass/forb – 4%, shrub/scrub – 6%, lakes and rivers (1%), other (1%) (N.C. State University 2008). Review of 2012 aerial photography reveals that residential, agricultural, non-industrial private forests and industrial forests dominate the landscape immediately surrounding both game lands. Agricultural use in the immediate vicinity of the game lands is dominated by row crops, pasture, and land used for hay production. Due to its close proximity to Morganton there are many residences and subdivisions in the vicinity of JRGL. The views on many of the ridges surrounding SMGL are outstanding. Although several resort type subdivisions were planned near SMGL, only a few have come to fruition. This is likely due to the downturn in the economy since 2008.

Landscape Context

Both JRGL and SMGL serve as important conservation corridors enhancing the connectivity among public lands managed primarily for conservation purposes such as the Pisgah National Forest, Thurmond Chatham, Mitchell River, Buffalo Cove, Pond Mountain, Three Top Mountain, Sandy Mush and Green River Game Lands, South Mountains and Lake James State Parks, Lisenbury Mountain, Biggerstaff/Yellowtop Mountain, Cherry Mountain, Smith/Hildebran Mountain, and Box Creek/Camel Knob State Natural Heritage Areas, and various other private tracts in the area that are managed for conservation purposes. In a broader sense JRGL and SMGL enhance connectivity regionally to such properties as the Sumter National Forest to the south, the Nantahala National Forest and Great Smoky Mountains National Park to the west, and the Cherokee, Jefferson, and George Washington National Forests to the north.

Purpose

The purpose of JRGL and SMGL is to manage habitats and communities to benefit aquatic and terrestrial wildlife resources on the property. These game lands provide opportunities for public hunting, fishing, trapping, wildlife viewing, and other wildlife based recreational activities. These are the primary public uses of these game lands. Both game lands also provide other public outdoor recreational opportunities to the extent that these uses are compatible with the conservation and management of wildlife resources and do not displace primary users. Finally, game lands provide a sustainable yield of forest products as allowed by topography, NHP dedications, and other factors. All forestry conducted on game lands is directed by wildlife management objectives.

Unique Values/Public Use

An abundance of natural resources are located on both JRGL and SMGL. In addition, JRGL is immediately adjacent Morganton and only 6 miles from Lenoir. South Mountains Game Land, too, is in proximity to both of these cities. Both game lands are within easy driving distance of Rutherfordton/Forest City, Hickory, and Marion. South Mountains Game Land is one of the nearest game lands to the Charlotte Metro area and is heavily used by residents from that area. The combination of natural resources found on both game lands as well as their proximity to population centers makes these game lands a popular destination for outdoor recreation.

The N.C. Natural Heritage Program has established dedicated nature preserves that include most of SMGL and 1,007 acres of JRGL (North Carolina Natural Heritage Program 2014). Additionally, the Rollins/South Mountains State Natural Area includes most of SMGL (North Carolina Natural Heritage Program 2014). The Rollins/South Mountains State Natural Area has an R-rating of exceptional and a C-rating of exceptional (North Carolina Natural Heritage Program 2014).

South Mountains Game Land serves as an important reservoir for a number of endangered, threatened, or rare species. White irisette (*Sisyrinchium dichotomum*) is federally endangered and is documented on the game land (North Carolina Natural Heritage Program 2014). The bog turtle (*Glyptemys muhlenbergii*) and small whorled pogonia (*Isotria medeoloides*) are both federally threatened species found on SMGL (bog turtle due to similarity of appearance) (North Carolina Natural Heritage Program 2014). An additional 33 species found on SMGL are considered significantly rare, endemic, or species of special concern at the state level (North Carolina Natural Heritage Program 2014) (Table 2). In addition, many common species of both flora and fauna occur on the game land.

Table 2. State endangered, threatened, significantly rare, and species of special concern present on South Mountains Game Land (North Carolina Natural Heritage Program 2014).

Scientific Name	Common Name	EO-Status	State Status	Federal Status	S-Rank	G-Rank
Cambarus lenati	Broad River Stream Crayfish	Current	SR		S2	G2
Autochton cellus	Golden Banded-Skipper	Current	SR		S2	G4
Erynnis martialis	Mottled Duskywing	Current	SR		S2	G3
Plethodon meridianus	South Mountain Gray-cheeked Salamander	Current	SR	FSC	S2	G2
Glyptemys muhlenbergii	Bog Turtle	Current	T	T(S/A)	S2	G3
Celastrus scandens	American Bittersweet	Current	E		S2?	G5
Cirsium carolinianum	Carolina Thistle	Current	E		S2	G5

Quercus prinoides	Dwarf Chinquapin Oak	Current	E		S1	G5
Anemone caroliniana	Prairie Anemone	Current	E		S1	G5
Anemone berlandieri	Southern Anemone	Current	E		S2	G4?
Sisyrinchium dichotomum	White Irisette	Current	E	E	S2	G2
Sceptridium jenmanii	Alabama Grape-fern	Current	SC-V		S2	G3G4
Berberis canadensis	American Barberry	Current	SC-V		S2	G3
Thermopsis mollis	Appalachian Golden-banner	Current	SC-V		S2	G3G4
Juniperus communis var. depressa	Dwarf Juniper	Current	SC-V		S1	G5T5
Collinsonia tuberosa	Piedmont Horsebalm	Current	SC-V		S1	G3G4
Liatris microcephala	Small-head Blazing-star	Current	SC-V		S1	G3G4
Helianthus laevigatus	Smooth Sunflower	Current	SC-V		S3	G4
Monotropsis odorata	Sweet Pinesap	Current	SC-V	FSC	S3	G3
Solidago ulmifolia	Elm-leaf Goldenrod	Current	SR-D		S1?	G5
Eupatorium saltuense	Tall Boneset	Current	SR-L		S1?	G4
Woodsia appalachiana	Appalachian Cliff Fern	Current	SR-P		S2	G4
Packera paupercula var. paupercula	Balsam Ragwort	Current	SR-P		S1?	G5T5
Sceptridium oneidense	Blunt-lobed Grape-fern	Current	SR-P		S2	G4
Ilex longipes	Georgia Holly	Current	SR-P		S1	G5
Stewartia ovata	Mountain Camellia	Current	SR-P		S2	G4
Lysimachia tonsa	Southern Loosestrife	Current	SR-P		S2	G4
Hackelia virginiana	Virginia Stickseed	Current	SR-P		S1S2	G5
Robinia viscosa	Clammy Locust	Current	SR-T		S1	G3
Cuscuta coryli	Hazel Dodder	Current	SR-T		S1?	G5?
Scientific Name	**Common Name**	**EO-Status**	**State Status**	**Federal Status**	**S-Rank**	**G-Rank**
Trichostema setaceum	Narrowleaf Bluecurls	Current	SR-T		S2	G5
Chelone obliqua	Red Turtlehead	Current	SR-T		S2	G4
Liatris turgida	Shale-barren Blazing-star	Current	SR-T		S1S2	G3
Liatris aspera	Rough Blazing-star	Current	T		S1	G4G5
Isotria medeoloides	Small Whorled Pogonia	Current	T	T	S1S2	G2
Trillium simile	Sweet White Trillium	Current	T		S2	G3

While JRGL does not compare to SMGL in terms of a reservoir for rare, threatened, and endangered species it does contain the federally threatened bog turtle (*Glyptemys muhlenbergii)* (due to similarity of appearance) (North Carolina Natural Heritage Program 2014*).* The Carolina foothills crayfish (*Cambarus johni*), which is considered significantly rare at the State level, is also found in the Catawba River adjacent JRGL (North Carolina Natural Heritage Program 2014). It is important to note that comprehensive inventories have not yet been conducted for many taxonomic groups and JRGL may contain greater biodiversity than is currently realized.

Hunting is a popular activity on both game lands with white-tailed deer and wild turkey the two primary big game species. All hunting is by permit only at JRGL, while SMGL is a 6 day per week game land.

Deer harvest at JRGL was 8.6/mi^2 in 2011, 5.4/mi^2 in 2012, and 7.2/mi^2 in 2013. Does comprised 54% (2011), 45%, (2012) and 43% (2013) of the harvest. The significant drop in harvest in 2012 was likely due to a severe epizootic hemorrhagic disease (EHD) outbreak in the region in late summer and early fall 2012. The deer herd at JRGL is generally stable, excepting disease outbreaks such as occurred in 2012. Turkey hunting is also very popular at JRGL. Harvest has averaged approximately 2 gobblers per square mile during the 2012-2014 seasons with little variation among years. Bears are sometimes present on JRGL, but are generally only transient in nature. Due to this, permit bear hunts have not been offered on the game land. Several beaver ponds and sizeable streams are located on JRGL and waterfowl hunting is popular on the game land. Gray squirrel, cottontail rabbit, mourning dove, crow, red and gray fox, bobcat, raccoon, and opossum are small game and furbearer species found and hunted for on JRGL.

Deer harvest at SMGL was 1.6/mi^2 in 2011, 1.4/mi^2 in 2012, and 0.9/mi^2 in 2013. The decrease in 2013 is likely due to a severe hard mast failure that year, with deer leaving the mostly forested game land in favor of better food availability on private land. Does comprised 22% (2011), 17%, (2012) and 41% (2013) of the harvest respectively. Any significance regarding the increase in % doe harvest for 2013 cannot be determined at present. Based on harvest data and observations made in the field by NCWRC staff, the deer herd at SMGL is generally stable to slightly declining. Turkey hunting is very popular at SMGL. Gobblers harvested per square mile during the last 3 seasons have been 1.2 (2012), 2.0 (2013), and 0.9 (2014). Variation in annual harvest is likely due to poult survival and the hard mast crop. High poult survival in a given year normally leads to an increased abundance of gobblers 2 springs later. In years of hard mast abundance turkeys generally stay on SMGL through winter and into the spring. In years of poor mast abundance turkey often leave the game land in fall or winter seeking more abundant and varied food sources on private land. The turkey population has remained stable on SMGL for a number of years.

Black bear have increased their range over the past 20 years in North Carolina and are present on SMGL, but only at low numbers. Since 2011, only 4 bears have been harvested on the

game land. Gray squirrel, cottontail rabbit, mourning dove, crow, red and gray fox, bobcat, raccoon, and opossum are small game and furbearer species found and hunted for on SMGL.

Birding opportunities are available on both JRGL and SMGL. South Mountains Game Land, due to the CURE program, offers birders the chance to encounter species that prefer both forested and early successional habitats. Johns River Game Land also offers birders the opportunity to encounter both forest interior species and those that prefer edge to more open habitats. Both game lands offer opportunities for other outdoor recreational activities. These game lands are popular with hikers, and JRGL due to its gentle terrain and proximity to Morganton offers easy access to those interested in taking a short hike without utilizing a good portion of the day to do so. A 12.4 mile designated horse trail is provided on SMGL, with riding available seasonally from mid-May through August. A designated horseback riding trail is not offered on JRGL due to a lack of suitable roads (graveled) of sufficient length available there. Johns River Game Land offers the opportunity for boating and canoeing along the Johns and Catawba Rivers. Canoeing along Lower Creek on JRGL is available when sufficient flow is present.

JRGL contains ample fishing opportunities for riverine and reservoir species such as largemouth bass, smallmouth bass, walleye, musky, striped bass, and various sunfish and catfish species. All streams on SMGL are Public Mountain Trout Waters and are classified as Wild Trout Waters. Additionally, two ponds are located on SMGL and managed as Public Fishing Access areas. These ponds are stocked with channel catfish once a month from May through October.

The NCWAP (N.C. Wildlife Resources Commission, 2005) is a comprehensive wildlife conservation plan that prioritizes species of greatest conservation need (SGCN). Approval of this plan by the United State Fish and Wildlife Service makes NCWRC eligible for State Wildlife Grant funding to address SGCN through inventory, monitoring, research, and management. The NCWAP is currently in revision and should be completed in 2015. The list of priority species not only consists of rare and endangered species but also those that are not officially listed but in need of inventory, monitoring, and/or research. Spring bird surveys were conducted in relation to the CURE program from 2002 to 2014 on SMGL. Sixty-one species were documented during these surveys. Of these, seventeen were SGCN including Northern bobwhite (*Colinus virginianus*), blue grosbeak (*Passerina caerulea*), blue-winged warbler (*Vermivora cyanoptera*), cerulean warbler (*Setophaga cerulea*), chimney swift (*Chaetura pelagica*), Eastern wood-pewee (*Contopus virens*), field sparrow (*Spizella pusilla*), hairy woodpecker (*Picoides villosus*), hooded warbler (*Wilsonia citrina*), Kentucky warbler (*Geothlypis formosa*) prairie warbler (*Setophaga discolor*), wood thrush (*Hylocichla mustelina*), Eastern whip-poor-will (*Antrostomus vociferus*), yellow-breasted chat (*Icteria virens*), yellow-billed cuckoo (*Coccyzus americanus*), red-headed woodpecker (*Melanerpes erythrocephalus*), and Northern flicker (*Colaptes auratus*). Nighttime roadside surveys for nightjars have documented Eastern whip-poor-will on the game land, and both whip-poor-will and Chuck will's widows (*Antrostomus carolinensis*) adjacent to the game land. SMGL also provides habitat for many wintering birds including numerous sparrows and even golden eagles. Incidental records or other documentation of other SGCN on both game lands include bog turtle and Eastern box

turtle. A species endemic to the South Mountains, the South Mountain gray-cheeked salamander (*Plethodon meridianus*), occurs on the game land and will likely be a SGCN after the 2015 NCWAP revision. Two SGCN bat species, Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) and Northern long-eared bat (*Myotis septentrionalis*) likely occur on SMGL and have been documented on South Mountains State Park to the north. More bat species are likely to be SGCN due to the effects of White Nose Syndrome, a deadly, exotic, fungal disease, affecting populations of some species. Surveys for reptiles, amphibians, and small mammals, including bats, are needed on both game lands.

The entire North Fork First Broad watershed and its tributaries on SMGL have the highest water quality rating in North Carolina (HQW/ORW; N.C. Division of Water Resources 2013). Additionally, the John's River watershed is rated as HQW (N.C. Division of Water Resources 2013) The NCWAP designates the Upper First Broad River in SMGL and the John's Rivers in JRGL as priority watersheds (N.C. Wildlife Resources Commission 2005). There are several State listed species that occur on this game land, including the Broad River Stream Crayfish *Cambarus lenati*, Broad River Spiny Crayfish *Cambarus spicatus*, Brook Floater *Alasmodonta varicosa,* Notched Rainbow *Villosa constricta,* and Eastern Creekshell *Villosa delumbis* (North Carolina Natural Heritage Program 2014).

GOALS

- Maintain and/or restore a diversity of habitat types and forest age classes through science based land management that are properly interspersed and juxtaposed across the landscape to ensure that a wide variety of terrestrial and aquatic wildlife species are conserved on both JRGL and SMGL.
- Manage popular sport fish and game species at appropriate levels through science based land management and sound regulations on both game lands.
- Provide quality habitat for endangered, threatened, and rare species located on both game lands to ensure their continued existence and to promote recovery.
- Provide sufficient infrastructure and opportunity for all users to enjoy a quality experience with minimal habitat degradation and minimal conflict among user groups while on either game land.

MEASURES OF SUCCESS

- Wildlife and fish inventories and monitoring indicate that a wide variety of species are present at appropriate levels on both JRGL and SMGL.
- Inventories of forest and early successional communities show that progress is being made toward accomplishing maintenance and restoration goals on both game lands.
- Monitoring and surveys and inventories of target sport fish and game species on both game lands indicate that population levels of these species are at appropriate levels.
- Monitoring and surveys on both game lands indicate that populations of endangered, threatened, and rare species found on the game land are stable or increasing.
- Infrastructure is provided and maintained on both game lands at a level that allows the public to reasonably access and enjoy the game land.
- Public use of both game lands is managed so that minimal conflicts among game land users occur.
- Agreements with conservation partners are initiated for both game lands that allow game land goals to be reached more expediently.
- Surveys of user groups indicate general satisfaction with management on the game lands.
- Valid public complaints regarding management of both game lands are minimal.

HABITATS

Habitat types are defined according to the NCWAP and are delineated according to an analysis of SEGAP data (N.C. State University 2008) as well as GIS data collected or digitized by NCWRC staff (Appendix 1, Maps 9 and 10).

Oak Forest

Oak forests are by far the predominant habitat type on SMGL, occupying approximately 60% of the game land. Since JRGL was operated as an industrial forest before State acquisition, much of the oak forest on the property was converted to pine. Oak forests at JRGL currently occupy only 32% of the game land and generally occur mixed with pines. Thus, we subdivide oak forests as either Southern Appalachian oak forest (SAOF) or dry oak-pine forest.

Southern Appalachian Oak Forest

- Current Extent and Condition

Southern Appalachian oak forest comprises about 99% of the oak forests on SMGL. This forest type is generally found on the mesic (wetter) sites and is often located on open slopes, ridgetops, lower elevation peaks, and higher parts of broad valleys (NatureServe 2007). SAOF is typically dominated by oak species, most typically chestnut oak (*Quercus prinus),* white oak *(Quercus alba)*, scarlet oak (*Quercus coccinea)*, and black oak (*Quercus velutina*) with varying amounts of hickory (*Carya* spp.), red maple (*Acer rubrum)*, yellow poplar (*Liriodendron tulipifera),* and other species (NatureServe 2007). American chestnut (*Castanea dentate)* was once a prominent species in many of these forests. The understory ranges from sparse to dense thickets of ericaceous shrubs to open with a sparse to moderate herbaceous layer.

- Desired Future Condition (DFC)

DFC include oak woodlands on areas accessible and operable for timber harvest (primarily shelter-wood cutting), oak savannah development on areas most accessible, operable, and appropriate for prescribed burning rotations, and old growth oak stands on dedicated primary areas or areas inaccessible or inoperable for active management.

Generally, oak woodlands will have a mix of age class and size distribution with advanced oak regeneration available to perpetuate a dominant oak component in the stand. Oak savannas generally have a much more open canopy dominated by oaks (as a goal, averaging a diameter at breast height (DBH) of 16 inches) but a very open understory with a native grass and forb component as the dominant ground cover. Old growth oak stands will eventually develop an all age class distribution with large, medium and small trees dispersed throughout the stand. As a goal, these stands will be well distributed across the game land to promote landscape diversity.

- Target Game Species

Target game species include white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), gray squirrel (*Sciurus carolinensis*) and raccoon (*Procyon lotor*).

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include Eastern whip-poor-will, cerulean warbler, wood thrush, Eastern wood-pewee, hooded warbler,

timber rattlesnake (*Crotalus horridus*), Eastern box turtle (*Terrapene carolina*), and South Mountains gray-cheeked salamander (SMGL only).

- Management Strategies and Needs

Management strategies include timber harvest (primarily shelter-wood cutting but also some clear-cutting may be employed to achieve oak regeneration goals), natural regeneration (but also may include some planting, primarily of white oak), herbicide use to control competition with oak regeneration, and prescribed burning to promote oak regeneration (less frequent and intense for oak woodland development and more frequent and intense on areas selected for oak savannah conditions). Participation in American chestnut restoration efforts will occur as appropriate and feasible.

- Infrastructure needs

Infrastructure needs will include new logging road and firebreak construction in some areas and installing new gates to control access. Reconstruction, refurbishing, improvement, and maintenance of old roads and firebreaks will also be a significant infrastructure need.

- Management Challenges

Management challenges in Southern Appalachian Oak Forests include gypsy moth, sudden oak death syndrome, hypoxylon canker, oak decline, lack of adequate advanced oak reproduction, invasive species, incompatible adjacent land uses, limited days when prescribed burning can be employed, and climate change.

Dry Oak-Pine Forest

- Current Extent and Condition

Dry oak-pine forest (DOPF) typically occurs at lower elevations and on drier sites than SAOF. It comprises 100% of the oak forests on JRGL and only 1% of the oak forests on SMGL . This forest type is dominated by upland oaks and pines. Common oak species include chestnut oak (*Quercus prinus),* white oak *(Quercus alba)*, and scarlet oak (*Quercus coccinea).* Common pine species include*,* shortleaf pine *(Pinus echinata),* Virginia pine *(Pinus virginiana)*, pitch pine (*Pinus rigida*), and table mountain pine (*Pinus pungens*) at SMGL. At JRGL common pine species include shortleaf pine *(Pinus echinata)* and Virginia pine *(Pinus virginiana)*, as well as loblolly pine (*Pinus taeda*) and white pine (*Pinus strobus*), which have seeded in from nearby managed (planted) pine forests. Varying amounts of hickory (*Carya* spp.) and red maple (*Acer rubrum)* are also present. A dense understory of mountain laurel (*Kalmia latifolia*) and/or blueberry

(*Vaccinum sp.)* is often present at SMGL, with mountain laurel generally absent on JRGL.

- Desired Future Condition

The goal will be to manage for a diverse mix of common oak species along with shortleaf, table mountain, and pitch pines. Generally, oak-pine woodlands will have a mix of age class and size distribution with advanced oak-pine regeneration available to perpetuate the stand. Oak-pine savannas generally have a much more open canopy but a very open understory with a native grass and forb component as the dominant ground cover. Old growth oak stands will eventually develop an all age class distribution of large, medium and small trees dispersed throughout the stand. As a goal, these stands will be well distributed across the game land to promote landscape diversity.

- Target Game Species

Target game species include white-tailed deer, wild turkey, gray squirrel, and raccoon.

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include Eastern wood-peewee, brown-headed nuthatch (*Sitta pusilla*), wood thrush, Eastern whip-poor-will, chuck-will's-widow, hairy woodpecker, Northern flicker, yellow-billed cuckoo, timber rattlesnake, Eastern box turtle, and South Mountains gray-cheeked salamander (SMGL only).

- Management Strategies and Needs

Management strategies include timber harvest (primarily shelter-wood cutting but also some clear-cutting may be employed to achieve oak-pine regeneration goals), natural regeneration on some areas (especially on sites with oak-table mountain/pitch/shortleaf pine regeneration goals), and planting shortleaf pine where the primarily goal is restoration of shortleaf pine-oak stands. Some herbicide use may be employed but generally prescribed burning to promote oak-pine regeneration will be the primary tool (less frequent and intense for oak-pine woodland development and more frequent and intense on areas selected for oak-pine savannah conditions). In general, oak-pine woodlands will be emphasized on areas accessible and operable for timber harvest (primarily shelter-wood cutting) and oak-pine savannah development on areas most accessible, operable, and appropriate for prescribed burning rotations. Old growth oak-pine stands will be developed on dedicated primary areas or areas inaccessible and/or inoperable for active management.

- Infrastructure Needs

Infrastructure needs will include new logging road and firebreak construction in some areas and installing new gates to control access. Reconstruction, refurbishing, improvement, and maintenance of old roads and firebreaks will also be a significant infrastructure need.

- Management Challenges

Management challenges include southern pine beetle, gypsy moth, sudden oak death syndrome, hypoxylon canker, oak decline, invasive species, limited days when prescribed burning can be employed, incompatible adjacent land uses, and climate change.

Cove Forest

- Current Extent and Condition:

Cove forests occupy about 11% of SMGL and are absent on JRGL. This forest type consists of mesophytic hardwood or hemlock-hardwood forests of sheltered topographic positions (NatureServe 2007). Cove forests are generally found in hollows or small valleys that promote moist conditions and often occur on east or north facing slopes. Of the cove forests on SMGL the hemlock-hardwood association is limited to about 1.5%. The remainder includes a mosaic of acidic and "rich" coves that may be distinguished by individual plant communities based on perceived differences in soil fertility and species richness (NatureServe 2007). Rich coves normally have a well-developed herbaceous layer at ground level whereas acidic coves most often do not. Of the cove forests on SMGL not classified as hemlock-hardwood, about ½ would be considered rich cove. Characteristic species include buckeye (*Aesculus flava),* ash *(Fraxinus Americana),* basswood *(Tilia Americana),* yellow poplar *(Liriodendron tulipifera),* Silverbell *(Halesia tetraptera),* eastern hemlock *(Tsuga Canadensis),* American beech *(Fagus grandifolia),* Cucumber *(Magnolia acuminate)*, and Fraser magnolia (*Magnolia fraseri) (NatureServe 2007)*. Rhododendron (*Rhododendron catawbiense**)*** is the dominant understory in acidic coves and in the hemlock-hardwood association.

- Desired Future Condition

DFC includes ensuring a diverse species and age composition, protecting and promoting hemlock stands where possible, retaining streamside management zones/riparian buffers where needed, and providing appropriate levels of early successional wildlife habitat. In general, this forest type will be of an older age structure although a diversity of ages and species is an important DFC.

- Target game species

Target game species include white-tailed deer, wild turkey, gray squirrel, and raccoon.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include cerulean warbler, hooded warbler, wood thrush, hairy woodpecker, Eastern box turtle, masked shrew (*Sorex cinereus*), and South Mountains gray-cheeked salamander (SMGL only).

- Management strategies and needs

Management strategies include identifying, protecting, and treating hemlock stands where possible to reduce loss of this species, retention of variable buffers along either side of creeks, streams, and seeps, timber harvest using a mix of thinning (with attention to retaining a diverse mix of species beneficial to wildlife, including American Beech, persimmon, etc.) and clear-cutting techniques to create early successional wildlife habitat where feasible and appropriate, and natural regeneration. Old growth stands may be developed by default over time within streamside management zones/riparian buffers, dedicated primary areas, and on areas inaccessible and/or inoperable for active management. As a goal, all stand types and conditions will be well distributed across the game land to promote landscape diversity.

- Infrastructure needs

Infrastructure needs will include new logging road construction in some areas and installing new gates to control access as well as culverts, bridges, and fords for crossing streams and creeks. Reconstruction, refurbishing, improvement, culvert replacement, and maintenance of old roads and culverts will also be a significant infrastructure need.

- Management Challenges

Management challenges include invasive species (i.e., hemlock wooly adelgid), incompatible adjacent land uses, and climate change.

Pine Forest

Pine forests occupy approximately 48% of the land base on JRGL and 5% at SMGL. For purposes of this discussion pine forests are subdivided and classified as either dry coniferous woodlands or managed pines.

Dry Coniferous Woodlands

- Current Extent and Condition

Dry coniferous woodlands occupy about 3% of JRGL and 4% of SMGL. This forest type generally occurs on more xeric (drier) sites, especially ridge tops along with west and south facing slopes. Common pine species include, shortleaf pine *(Pinus echinata),* Virginia pine *(Pinus virginiana)*, pitch pine (Pinus rigida), and table mountain pine (*Pinus pungens*) at SMGL. At JRGL common pine species include shortleaf pine *(Pinus echinata)* and Virginia pine *(Pinus virginiana)*, as well as loblolly pine (*Pinus taeda*) and white pine (*Pinus strobus*), which have seeded in from nearby managed (planted) pine forests. A component of oaks that favor dryer drier sites, such as chestnut oak (*Quercus prinus)* and scarlet oak (*Quercus coccinea)* is frequently present. A dense layer of ericaceous shrubs is often present in the understory.

- Desired Future Condition

DFC includes a mix of pine woodlands and pine savannahs. The goal will be to restore table mountain/pitch pine stands on higher elevation sites and shortleaf pine on lower elevation sites. All sites will have a goal to create an open, diverse understory and herbaceous ground cover. Generally, pine woodlands will have a mix of age class and size distribution with advanced pine regeneration available to perpetuate the stand. Pine savannas generally have a much more open canopy but a very open understory with a native grass and forb component as the dominant ground cover.

- Target game species

Target game species include white-tailed deer and wild turkey.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include timber

rattlesnake, whip-poor-will, chuck-will's-widow, bats, red-headed woodpecker, and brown headed nuthatch.

- Management Strategies and Needs

Management strategies will primarily involve repeated prescribed burning to reduce hardwood canopy trees, open the understory, and promote table mountain, pitch, and shortleaf pine regeneration (less frequent and intense fire will create pine woodland conditions and more frequent and intense fires will promote pine savannah conditions). In some cases, stand replacement fires, timber harvest or other forestry practices using a mix of thinning and clear-cutting techniques, and planting shortleaf pine (where the primary goal is restoration of shortleaf pine stands) may be used.

- Infrastructure Needs

Infrastructure needs will primarily involve new firebreak construction in some areas and reconstruction, refurbishing, improvement, and maintenance of old roads and firebreaks in other areas.

- Management Challenges

Management Challenges include southern pine beetle, invasive species, incompatible adjacent land uses, climate change, lack of fire, limited days when prescribed burning can be employed, successional change, and encroachment by hardwoods.

Managed Pine Forest

- Current Extent and Condition

At JRGL, this forest type comprises about 45% of the game land. At SMGL, this forest type only comprises about 1% of the game land. These are primarily loblolly pine (*Pinus taeda)* and white pine (*Pinus strobus*) plantations planted by the former landowner. However, due to fire exclusion and white pine's shade tolerance, it has spread into other, less typical sites in some locations where it might not normally occur if historic disturbance regimes had continued. Similarly, loblolly pine (*Pinus taeda)* has spread into some locations from the planted stands. Understory conditions in "Managed Pine Forest" stands are typically absent of vegetative ground cover and shrubs but sometimes include a light amount of mountain laurel (*Kalmia latifolia*), a few mixed hardwood saplings, and/or scattered pine regeneration. While no forest age class information is available for SMGL, nearly 75% of these planted pine stands on JRGL are less than 40 years of age. These planted pine stands on JRGL range from about 20 years old up to 63 years of age (the oldest of these stands was planted in 1952).

- Desired Future Condition

DFC includes pine woodlands that are open (thinned), more diverse (mixed with hardwoods), and more structurally beneficial to wildlife, consisting of a herbaceous, grass, and forb component in the understory. The areas of loblolly stands may also develop pine savannah conditions where access and operability allow for prescribed burning rotations. The goal will be to restore any pine monoculture/plantation conditions to more diverse mixed pine-hardwood stands, which most likely occurred prior to plantation establishment.

- Target game species

Target game species include white-tailed deer and wild turkey.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include timber rattlesnake, Eastern whip-poor-will, chuck-will's-widow, bats, red-headed woodpecker, and brown-headed nuthatch.

- Management Strategies and Needs

Management strategies will primarily involve timber harvest (initially thinning and eventually clear-cutting) as these stands mature and develop merchantable timber. Natural regeneration of hardwoods will be key to diversifying these stands and developing a desired future mixed pine-hardwood composition. Some planting of oaks and some herbicide use may be employed where needed to develop pine-oak stands. Where appropriate and needed, prescribed burning may also be used.

- Infrastructure Needs

Infrastructure needs will include new logging road and firebreak construction in some areas and installing new gates to control access. Re-construction, re-furbishing, improvement, and maintenance of old roads and firebreaks will also be a significant infrastructure need.

- Management challenges

Management challenges include southern pine beetle, invasive species, and incompatible adjacent land uses.

Early Successional

Early successional habitats (ESH) are considered those on which the vegetation is ≤ 20 years of age. For purposes of this discussion early successional habitats are divided into 3 subcategories; Herbaceous, Shrub-Scrub, and Woody. Early successional habitat currently occupies approximately 10% of JRGL and 24% of SMGL.

Herbaceous

- Current Extent and Condition

Herbaceous ESH is comprised of grasses and forbs and is lacking a significant woody component. It occupies 3% of JRGL and 2% of SMGL. The majority of herbaceous ESH on both game lands is located in conventional and linear wildlife openings, along utility ROWs and roads, and other areas where sunlight is able to reach the ground. At JRGL, 92 acres along Johns River are currently leased to a local farmer for row crop production. For purposes of this discussion this acreage will be considered herbaceous ESH. This habitat is generally maintained using a variety of standard agricultural practices.

- Desired Future Condition

DFC includes maintaining currently planted openings and expanding the acreage of natural (especially in burned areas) and planted herbaceous ESH on both game lands where appropriate, to create habitat diversity across the landscape and to meet goals of the CURE Program at SMGL. At JRGL the acreage currently in row crop production will be restored to more desirable herbaceous ESH in phases as manpower and budgets allow. Herbaceous ESH will be composed of a variety of both planted and natural vegetation, and will have a diversity of vertical structure and layers composition conducive to songbird and other wildlife use.

- Target game species

Target game species include white-tailed deer, wild turkey, rabbit (*Sylvilagus floridanus*), mourning dove (*Zenaida macroura)*, and Northern bobwhite.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include Eastern whip-poor-will, American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), field sparrow,

timber rattlesnake, Eastern box turtle, and least weasel (*Mustela nivalis*). A major target in this type will be birds needing this specialized habitat.

- Management strategies and needs

Management strategies for establishing and maintaining herbaceous ESH habitat will include mowing, herbicide application, prescribed burning, discing, planting, the application of soil amendments, and day-lighting.

- Infrastructure Needs

Infrastructure needs will include installing new gates to control access as well as installation and maintenance of culverts, bridges, and fords for crossing streams and creeks. Construction and maintenance of firebreaks will be needed where this management technique is employed.

- Management Challenges

Management challenges include limited days when prescribed burning can be employed, invasive species, Natural Heritage Program dedications, incompatible adjacent land uses, and climate change.

Shrub-Scrub

- Current Extent and Condition

Scrub-Shrub habitat refers to those ESHs comprised mainly of low growing, multi-stemmed woody vegetation ≤10 years of age. Grasses and forbs can be a significant component of this habitat, especially during the first years of growth. Shrub-scrub habitat ranges from dense woody vegetation to a mix of woody vegetation interspersed with grasses and forbs. Mature trees may be present, but only at widely spaced intervals. The character of this habitat depends on its age, how it was established, site quality, aspect, and other factors. On JRGL this habitat type occupies 5% of the game land and at SMGL 9%. At JRGL most of this habitat type is located in recent timber sales with the remainder located along utility ROWs, roadways, forest canopy gaps, etc. At SMGL most of this habitat type is found in prescribed burn units that have been repeatedly burned to remove most of the canopy or in timber sales that are less than 10 years old or that have been roller chopped to maintain this habitat type. Most of this habitat at SMGL was established/maintained as part of the CURE Program.

- Desired Future Condition

DFC includes a mix of shrub/scrub ESH created by timber harvests and prescribed burns across both game lands to create diversity on the landscape. An important DFC is to provide a continuous supply of this habitat type through time, especially at SMGL to meet the goals of the CURE Program. Actual proportions of this habitat will be determined by the habitat needs of target species.

- Target game species

Target game species include white-tailed deer, wild turkey, rabbit, mourning dove, woodcock (*Scolopax minor*), and Northern bobwhite.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include blue grosbeak, blue-winged warbler, field sparrow, prairie warbler, yellow-breasted chat, willow flycatcher (*Empidonax traillii*), timber rattlesnake, and least weasel. A major target in this type will be birds needing this specialized habitat.

- Management Strategies and Needs

Techniques used to provide and maintain shrub-scrub ESH will include periodic timber harvests, mechanical treatments, herbicide application, and repeated prescribed burning.

- Infrastructure Needs

Infrastructure needs will include new logging road and firebreak construction in some areas and installing new gates to control access. Reconstruction, refurbishing, improvement, and maintenance of old roads and firebreaks will also be a significant infrastructure need.

- Management Challenges

Management challenges include limited days when prescribed burning can be employed, invasive species, Natural Heritage Program dedications, incompatible adjacent land uses, and climate change.

Woody

- Current Extent and Condition

Woody ESH includes areas with vegetation age classes between 11- 20 years. This habitat type is lacking at JRGL and occupies 13% of SMGL. It differs from herbaceous and shrub-scrub ESH by having a composition consisting predominantly of regenerative, woody vegetation with some assemblages of shrubs, and usually to a much lesser extent, grasses and forbs. Areas such as abandoned fields and secondary successional areas such as clear-cuts are examples of this habitat type. Most of this habitat at SMGL lies within timber sales conducted by the former land owner that are located in areas not conducive to prescribed burning or other management techniques used to maintain ESH.

- Desired Future Condition

An important DFC is to provide a continuous supply of this habitat type through time and to increase the amount of this habitat type in the existing open areas or in timber treatment areas.

- Target game species

Target game species include white-tailed deer, wild turkey, rabbit, mourning dove, woodcock, and Northern bobwhite.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on JRGL and/or SMGL. Some examples from the 2005 edition include prairie warbler, willow flycatcher, yellow-breasted chat, and least weasel. A major target in this type will be birds needing this specialized habitat.

- Management Strategies and Needs

Management strategies used to provide and maintain woody ESH will include periodic timber harvests, mechanical treatments, herbicide application, and repeated prescribed burning.

- Infrastructure Needs

Infrastructure needs will include new logging road and firebreak construction in some areas and installing new gates to control access. Reconstruction, refurbishing, improvement, and maintenance of old roads and firebreaks will also be a significant infrastructure need.

- Management Challenges

Management challenges include limited days when prescribed burning can be employed, invasive species, Natural Heritage Program dedications, incompatible adjacent land uses, and climate change.

Low Elevation Cliffs/Rock Outcrops

- Current Extent and Condition

This habitat consists of cliffs or rock outcrops that may be vertical or horizontal and located on peaks, ridge tops, upper slopes, and other topographically exposed locations (Schafale and Weakley 1990). Vegetation is sparse and limited mainly to plants growing on bare rock, small ledges, and crevices (NatureServe 2007). Vegetation is primarily bryophytes, lichens, and herbs, with sparse stunted trees and shrubs rooted in deeper soil pockets and crevices (NatureServe 2007). This habitat type is lacking on JRGL. At SMGL this habitat is mainly found embedded in forested habitat across the game land. Rock outcrops comprise less than 1% of SMGL but this may be a low estimate since the presence and location of much of this habitat can only be verified by ground truthing.

- Desired Future Condition

DFC includes maintaining the undisturbed structure of cliffs and rock outcrops.

- Target Game Species

None

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on SMGL. Some examples from the 2005 edition include timber rattlesnake, Eastern small-footed bat (*Myotis leibii*), Northern long-eared bat (*Myotis septentrionalis*), and South Mountains gray-cheeked salamander (SMGL only).

- Management Strategies and Needs

Large cliffs and rock outcroppings that have little vegetation providing shade should be maintenance free. Recreational use of these types of outcroppings should be evaluated to determine the extent of use and monitored so that impacts are minimized. Other outcroppings should be protected from soil disturbing activities and evaluated for buffering depending upon specific outcrop habitat attributes. For example, management for salamanders may require a forested buffer to protect salamander habitat, whereas another may be better suited to day-lighting for reptile conservation. These

management strategies will often be dictated by the size of the outcrop, the occurrence of species, and forest habitat in which the outcropping is embedded. Outcroppings should be surveyed and mapped as needed to provide baseline data.

- Infrastructure Needs

None.

- Management Challenges

Management challenges include recreational use (e.g., climbing and bouldering), invasive species, soil disturbance, incompatible adjacent land uses, and climate change.

Floodplain Forest

- Current Extent and Condition

At JRGL, floodplain forests occur along the Catawba and Johns Rivers and adjacent Bristol and Lower Creeks and make up approximately 5% of the game land. Common species include sweetgum (*Liquidambar styraciflua)*, yellow poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), Sycamore (*Platanus occidentalis*), black birch (*Betula nigra*), and boxelder (*Acer negundo*), **(**NatureServe 2007). A well-developed groundcover ranging from herbaceous to shrubby is often present. This habitat type is found in insignificant quantities at SMGL.

- Desired Future Conditions (DFC)

DFC is a relatively undisturbed forest providing important buffers along rivers and major streams and creeks but pockets of disturbed areas occurring that provide important habitat for woodcock and other species.

- Target game species

Target game species include white-tailed deer, wild turkey, raccoon, beaver and woodcock.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on the game land. Some examples from the 2005 edition include yellow-billed cuckoo, red headed woodpecker, Kentucky warbler, Eastern kingsnake, bog turtle,

spotted salamander, marbled salamander, bats, bog lemming (*Synaptomys cooperi*), and smoky shrew (*Sorex fumeus*).

- Management strategies and needs

Management strategies include identifying and protecting these forests and retention of appropriate buffers along either side of the associated rivers and their tributaries. However, riparian zones will not in all cases involve no management and management will be allowed for fish and wildlife purposes while ensuring there is no erosion or siltation. In some cases, and where feasible and appropriate, prescribed fire may be allowed to back into these corridors, especially where the rivers and associated tributaries are being utilized as natural firebreaks. In other cases, limited harvest may be used to create early successional habitat for species like the woodcock. Old growth stands will also be developed over time within these streamside management zones and riparian buffers.

- Infrastructure Needs

Infrastructure needs will include installing new gates to control access as well as installation and maintenance of culverts, bridges, and fords for crossing streams and creeks.

- Management Challenges

Management challenges include invasive species, incompatible adjacent land uses, and climate change.

Bogs and Small Wetland Communities

- Current Extent and Condition

Bogs and small wetlands comprise <1% of either JRGL or SMGL. Though found in small quantities, this is a very important habitat type due to the complex of species that utilize and depend on it. Bogs and small wetlands occur more frequently on JRGL than at SMGL. At JRGL it is mainly found embedded within floodplain forest on the game land, but isolated examples may be found embedded within other habitat types. While this habitat type occurs less frequently on SMGL, it is nonetheless present in very small quantities and warrants management consideration. The presence and location of much of this habitat can only be verified by ground-truthing.

- Desired Future Conditions (DFC)

DFC includes maintaining and/or enhancing this habitat type.

- Target game species

Target game species include waterfowl, woodcock, and raccoon.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur at JRGL and/or SMGL. Examples include the bog turtle, bog lemming, four-toed salamander (*Hemidactylium scutatum*), mole salamander (*Ambystoma talpoideum*), and common ribbonsnake (*Thamnophis sauritus sauritus*).

- Management strategies and needs

Management of this habitat type is varied and depends on the current status of the wetland (i.e., forested or open, intact or impacted by draining/ditching, presence of undesirable and/or invasive plant species). Furthermore, each bog/wetland should be individually evaluated as the management goals will vary from one bog/wetland to another. In some instances, hydrological restoration may be needed, including plugging ditches, installing water control structures, addressing headcutting or erosion problems, and removing drainage devices. For some wetlands, vegetation management may be needed. This can be accomplished in a number of ways, including but not limited to manual hand-clearing of woody and/or invasive plants, prescribed burning, and grazing. In other wetlands, the desired condition may be a forested bog, but each will need to be evaluated on a case by case basis by WRC biologists and species experts.

- Infrastructure Needs

Infrastructure needs may include installing water control structures, installing gates to control access as well as installation and maintenance of culverts, bridges, and fords for crossing streams and creeks.

- Management Challenges

Management challenges include historical fine sediment pollution from erosion in the subject watersheds, invasive species, incompatible adjacent land uses, and climate change.

Riverine/Aquatic Communities

- Current Extent and Condition

Johns River Game Land contains approximately 20 miles of “blue line” streams, while SMGL contains approximately 80 miles. The entire North Fork First Broad watershed and its tributaries on SMGL have the highest water quality rating in North Carolina (HQW/ORW; N.C. Division of Water Resources 2013). Additionally, the John’s River watershed is rated as HQW (N.C. Division of Water Resources 2013). The NCWAP designates the Upper First Broad River in SMGL and the Johns River in JRGL as priority watersheds (N.C. Wildlife Resources Commission, 2005). The section of John’s River located on JRGL is mostly inundated by Lake Rhodhiss.

- Desired Future Conditions (DFC)

The desired future condition of aquatic habitat at JRGL and SMGL is reduced levels of fine sediment in headwater streams and no new introductions of invasive species.

- Target game species

Target game species include beaver, waterfowl and furbearers. The target cold water game fish species are rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) at SMGL . The target warm water game fish species are largemouth bass (*Micropterus salmoides)*, smallmouth bass (*Micropterus dolomieu)*, walleye (*Sander vitreus)*, muskellunge (*Esox masquinongy)* , striped bass (*Morone saxatilis)*, and various sunfish and catfish species.

- Target non-game species

Several State listed species occur on these game lands including the Broad River Stream Crayfish *Cambarus lenati*, Broad River Spiny Crayfish *Cambarus spicatus*, Brook Floater *Alasmodonta varicosa,* Notched Rainbow *Villosa constricta,* and Eastern Creekshell *Villosa delumbis* (North Carolina Natural Heritage Program 2014). The highest priority non-game fish species on the JRGL is V-lip Redhorse *Moxostoma pappillosum* (NCWAP 2005)

- Management Strategies and Needs

Riparian buffers will be left at widths of no less than those recommended by North Carolina Forest Service Forestry Best Management Practices (50 feet.). In areas where topography and/or site conditions dictate further protection, riparian buffers may exceed these recommendations. The NCWRC will seek to identify and to control any active sediment sources throughout both game lands. Common erosion sources on forested land include foot trails, roads, firebreaks, and stream crossings. Stream crossings are

common sources of fine sediment pollution because they often create bank erosion and can direct road runoff into streams.

Road and trail crossings on many tributaries are created using corrugated metal pipes. Unless carefully designed, these crossings can create movement barriers for fishes and other aquatic life by being perched on the downstream end or having a steep slope. An inventory of these crossings is needed to identify and fully understand which locations are creating barriers and recommend engineering solutions.

- Infrastructure Needs

JRGL and SMGL need infrastructure improvements to address erosion wherever it is occurring. Eroding foot trails and forest roads are the greatest sources of fine sediment pollution on the game land and some of these are in need of repair. In many cases, repair will require engineering designs and heavy equipment to out-slope roads, convert fords to dry crossings, and design effective water breaks. Less problematic trails need routine maintenance.

- Management Challenges

The primary management challenge to aquatic communities is the historical fine sediment pollution from erosion in the subject watersheds.

FOREST MANAGEMENT

Forest management practices are probably the most cost effective method available for affecting and achieving desired habitat conditions and diversity on the landscape on both JRGL and SMGL. Forestry practices are key to restoring communities to diverse compositions and structures. Forestry tools, including timber harvest, herbicides, prescribed burning, tree planting, and other silvicultural techniques will be used to achieve wildlife habitat goals and objectives. Additionally, these forestry tools and combinations of techniques are important and vital to restoration of certain habitat types and forest communities, improving wildlife habitat diversity within forest stands and at the landscape level, reducing the risk of catastrophic wildfire, keeping forests healthy, and providing sustainable forest resources.

Forest Land Class/Types and Conditions

On JRGL, industrial forest management before State acquisition has greatly affected forest composition and conditions. Much of the oak forests on the property were converted to pine and managed pine forests occupy 45% of JRGL (Figure 1). Pines also commonly occur in dry coniferous woodlands (3%) and in mixed pine/hardwood stands on JRGL. Thirty-two percent of JRGL is dry oak-pine forest. Floodplain forests (5%) are primarily restricted to the bottomlands along the Johns River and other major tributaries on the game land. Mesic forests occur in some areas (1%) of JRGL. Row crops (2%), open water (1%), and developed areas (3%) all occupy portions of JRGL. Less than 1% of JRGL is bare soil areas. As timber harvests occur, stand replacement burning is implemented and new wildlife openings are created on log landings, haul roads, and skid trails. An increase in early successional habitat occurs with this activity. Current levels of this habitat type on JRGL include herbaceous at 3% and shrub/scrub at 5%. As this early successional habitat matures, changes in percentages will occur as it grows and advances into the other forest types where not maintained. A detailed description of the species composition, condition, structure, and extent of occurrence of all these forest types and land classifications is presented and discussed previously in the Habitats section of this management plan.

As with much of the southern Appalachian region, southern Appalachian oak forests are by far the predominant habitat type on SMGL, occupying approximately 59% of the game land (Figure 2), with dry oak-pine forests only occurring on about 1% of this game land. Cove forests (11%) are also a very important community type on SMGL. Managed (planted) pine forests are limited to about 1% although pines commonly occur in dry coniferous woodlands (4%) in mixed pine/hardwood stands on SMGL. Floodplain forests, mesic forests, rock outcrops, open water, and developed areas all occupy less than 1% total on SMGL. As timber harvests occur, stand replacement burning is implemented and new wildlife openings are created on log landings, haul roads, and skid trails. An increase in early successional habitat occurs with this activity. Current levels of this habitat type on SMGL include herbaceous at 2%, shrub/scrub at 9%, and woody at 13%. As this early successional habitat matures, changes in percentages will occur as it grows and advances into the other forest types where not maintained. A detailed description of the species composition, condition, structure, and extent of occurrence of all these forest types and land classifications is presented and discussed previously in the “Habitats” section of this management plan.

Figure 1: Forest Land Class/Types on JRGL (N.C. State University 2008).

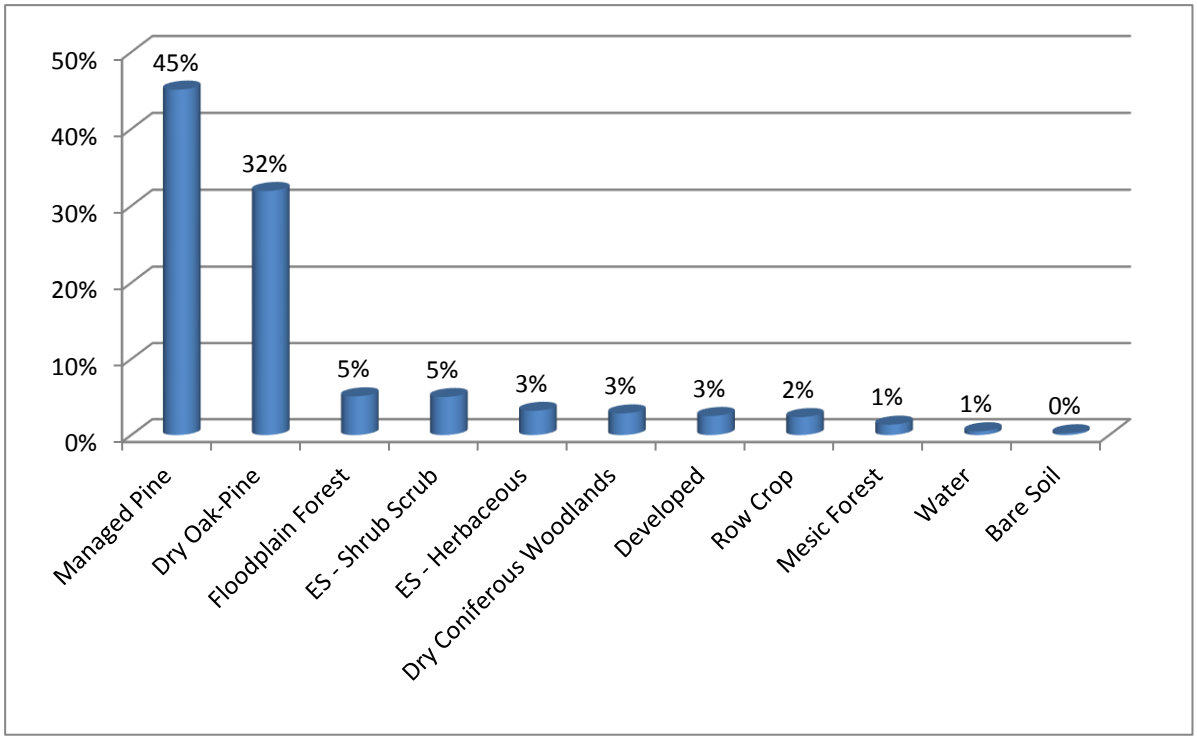
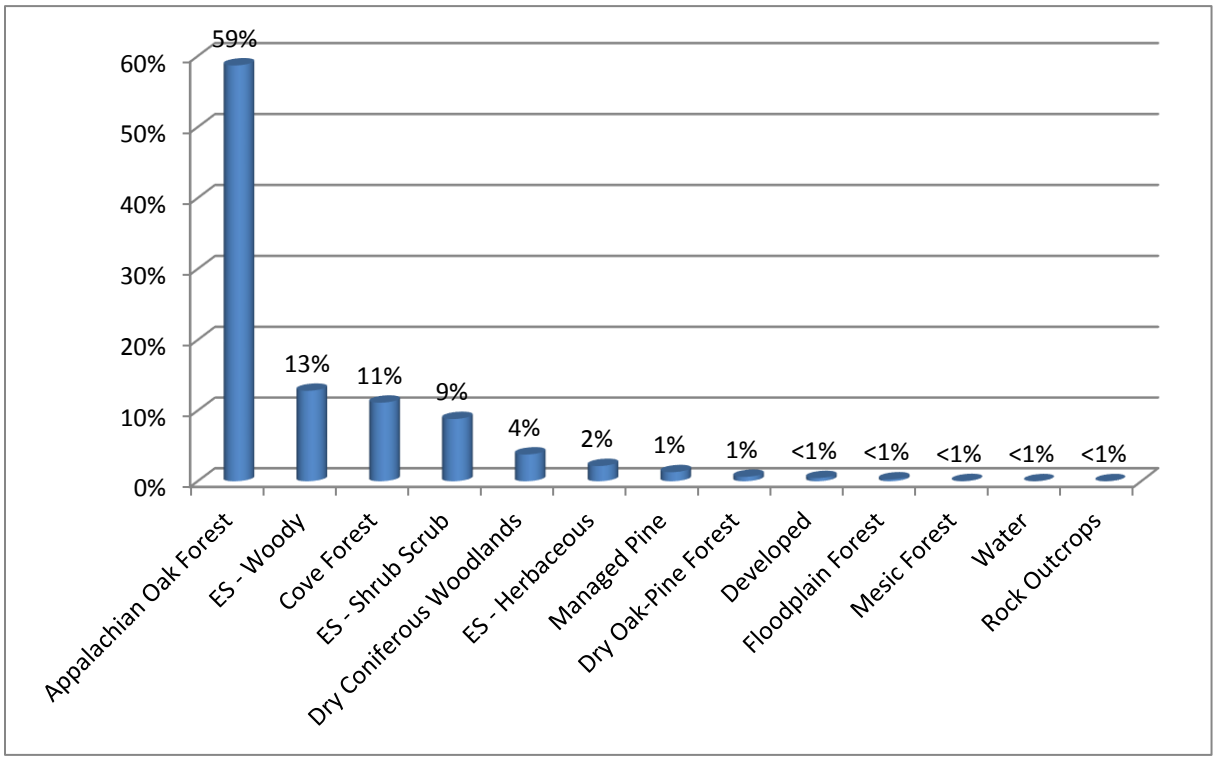


Figure 2: Forest Land Class/Types on SMGL (N.C. State University 2008).



Approximately 86% of JRGL and about 76% of SMGL are closed canopy forests. Younger and early successional forests and areas constitute relatively smaller portions of each game land. While no forest age class information is available for SMGL, nearly 75% of the managed pine forests (planted pine stands) on JRGL are less than 40 years of age. These planted pine stands on JRGL range from about 20 years old up to 63 years of age (the oldest of these stands was planted in 1952). Site indexes (a measure of productivity) on both game lands are variable and tend to be lower on the rocky ridges and dry sites and higher in the rich coves, mesic forests, and floodplain forests.

Forest Resource Needs

Desired future conditions and management strategies and needs are discussed in detail previously in the "Habitats" section of this management plan. Given the high percentage of oak stands on SMGL, the importance of oak mast (acorns) to a variety of wildlife species, the threat to oak forests from pathogens, inadequate advanced oak regeneration, and the threat of invasive species, and the need to increase the oak component on JRGL, forest management will continue to focus on oak and oak/pine forests. Timber harvest (primarily shelter-wood cutting and/or thinning), herbicide use (to control competition with oak regeneration), prescribed burning (to enhance forest stand structure and promote oak reproduction), and planting of oaks on some sites will be emphasized.

Additionally, many of the hardwood forests and pine forest stands (which are generally shorter lived than the hardwood forests) are mature and in need of harvest due to storm damage (ice, snow, and wind throw), past insect damage, and other factors. There is also a need to change pine monoculture/plantation conditions (especially on JRGL) to more diverse mixed pine-hardwood stands to improve wildlife habitat across the game lands and provide greater habitat diversity on the landscape. Timber harvest in pine stands (initially thinning and eventually clear-cutting) as these stands mature and develop merchantable timber will be emphasized. Natural regeneration of hardwoods will be key to diversifying these stands and developing a desired future mixed pine-hardwood composition. Planting of shortleaf pines and oaks for restoration and some herbicide use may be employed where needed to develop pine-oak stands. Where appropriate and needed, prescribed burning may also be used.

Forest management and wildlife habitat research on these game lands should be encouraged and the fire ecology research and restoration monitoring on SMGL with the Southern Blue Ridge Fire Learning Network should continue and be expanded.

Timber Harvest

Timber harvests will improve stand age class distribution on both game lands and will provide opportunities for continued productive forest stands in the future. Harvest methods employed will involve a variety of techniques including shelter-wood and selection type harvests, clear-cutting, and various thinning regimes. Non-commercial thinning (mechanical and by herbicide use) will also be utilized to meet stand needs and wildlife habitat management objectives. Some general guidelines for timber harvest on JRGL and SMGL include:

- Shelter-wood, selection type harvests, and various thinning regimes generally select leave trees that are beneficial to wildlife (oaks and other mast producers, etc.), although in some cases may include conifer species (hemlock, shortleaf pine, table mountain pine, etc.) where restoration is the goal, but may also be used to thin managed pines.

Commercially thinned unit, Johns River Game Land

- Clear-cut units will generally be 25 acres or less in size and will be distributed across the game lands to provide habitat diversity and early successional habitat needs on the landscape.
- Sites of proposed clear-cutting will be reviewed for significant cultural resources and all sites of proposed timber harvest will be reviewed with appropriate staff regarding issues

of protected plants, animals, significant resources, non-game species, potential management conflicts, and other issues.

- Firewood harvests will be administered through the sale of firewood permits on designated sites (usually along roads and at log landings where personal fuel wood is easily available).
- Riparian buffer zones will be left at widths of no less than those recommended by North Carolina Forest Service Forestry Best Management Practices and all North Carolina Forest Practices Guidelines will be applied where applicable.

Tree Planting and Reforestation

Generally, clear-cut pine and mixed pine/hardwood stands that are planted back with pine (most likely shortleaf pine on appropriate sites) will occur on a wide spacing of 14 feet by 14 feet to encourage development of mixed pine/hardwood stands, which will provide better habitat diversity than pure pine stands. Additionally, sites to be planted with pines will be site prepared by prescribed burning, which will generally occur in summer immediately following the nesting season. Areas planted with oaks will be planted on a similar spacing to those areas planted with pines. Natural regeneration has and will continue to be the major form of reforestation on JRGL and SMGL. In some cases herbicide use, mechanical release, and prescribed burning will be used to enhance both natural and planted regeneration (both pre and post-harvest) as needed.

Prescribed Burning

Prescribed burning is an effective and efficient tool used on game lands to improve wildlife habitat conditions, restore fire dependent and fire adapted ecosystems, reduce hazardous forest fuel loading minimizing the potential for catastrophic wildfire, prepare timber harvested sites (site preparation) and other forest stands for tree planting and natural regeneration, and manage fields and other wildlife openings.

Generally, understory burning is conducted during the winter and early spring and to a limited extent in the fall months. Understory burns are typically implemented on each burn unit every 3 to 5 years depending upon goals and objectives. In stands which include timber harvest where development of oak, pine, and/or oak/pine woodland conditions is desired, application of prescribed burning will be less frequent and less intense. On areas selected for development of oak, pine, and/or oak/pine savannah conditions, application of prescribed burning will be more frequent and more intense. On sites selected for maintenance of wildlife openings and management of early successional herbaceous, shrub/scrub, and woody habitat, prescribed burning may occur annually and/or every other year.

Personnel briefing prior to prescribed fire, South Mountains Game Land CURE area.

Prescribed fire, South Mountains Game Land CURE area.

Annual Forest Management Planning

Generally, an annual forest management plan will be developed for forestry and prescribed burning projects on JRGL and SMGL as part of the overall annual planning process for regional game lands. On JRGL and SMGL, this annual planning will be directed by this management plan and will address specific wildlife-forestry projects for JRGL and SMGL, including the game lands' forest management prescriptions, estimated project acreages (timber harvest, herbicide use, prescribed burning, tree planting, etc. used to achieve wildlife habitat goals and objectives), costs, and forest product receipts (from the sale of timber, pulpwood, firewood, etc.).

INFRASTRUCTURE

Infrastructure Assessment

Assessments of existing infrastructure at both JRGL and SMGL were conducted by Division of Engineering & Lands Management staff in July and August, 2014. The infrastructure maps in Appendix 1 show current locations of existing public access roads, administrative access roads, parking areas, primitive campgrounds, and horseback riding trails that are found on each game land. These maps also indicate locations for the infrastructure upgrades discussed below for both game lands. The results of these assessments along with recommendations for maintenance and improvements are discussed by category below.

Road Assessment

Johns River Game Land and SMGL both have an ample network of roads, which provide some access to the interior of the game lands and good access around the perimeters. These roads were inspected by Engineering and Lands Management staff during July and August of 2014.

Both game lands have roads open to public vehicular use, and roads that are only open to administrative traffic. Administrative access roads are used by NCWRC staff to gain access for habitat management projects and are also used by the public for foot access for hunting, hiking, wildlife viewing, and other outdoor recreational activities.

Existing Road Conditions

The roads that serve JRGL are in fair condition, while most need some level of improvement. The roads in the best condition include the following:

- Upper Road through Loop Road Unit

  This road provides access through the Loop Road Unit and provides direct access to the game land from Johns River Loop Road (S.R. 1434) and Old Johns River Road (S.R. 1435). This improved road allows 2 wheel drive vehicular access to newly created ADA hunter blinds. The construction of this road includes the addition of a parking area at the intersection with Old Johns River Road, as well as the installation of culverts to improve drainage. The road has a crowned, gravel surface with an approximate width of 12'.

Newly constructed upper road through Loop Road Unit, Johns River Game Land.

- Ragsdale Road

  This road provides access from Antioch Road (S.R. 1501) on the eastern side of the Lower Creek Unit. This road provides shared access to 3 private parcels and a public parking area. The road is in good shape, with a two way, gravel surface. There are some minor drainage issues at the intersection with Antioch Road, which are described later.

Some of the roads that serve SMGL are in good condition, while most need some level of improvement. The roads in the best condition include the following:

- Upper CCC Road (Western Portion)

  This road (7.6 mi.) provides the primary access across the northern portion of SMGL. The western portion of the road is a one lane gravel road in good condition. WRC staff currently maintains this road and adds gravel as necessary.

Future Road Improvements

Maintenance and needs for future improvements were identified on the following existing sections of NCWRC access roads. The recommended road improvements discussed in this section are grouped by priority as follows:

High Priority

While some of the roads at Johns River Game Land are in good condition, there are other roads that need different levels of upgrades. Over the next ten years, the highest priority roads for upgrade are the following:

- Valley View Road

  This road provides access from Highway US 64/NC 18 at the western side of the Lower Creek Unit of JRGL. This is the only road access to the game land west of Johns River. The first 0.25 miles of this road is paved, is maintained by the City of Morganton, and provides access to several residential properties. Once the road enters the game land, it becomes a narrow, dirt road in poor condition. This road should be improved to provide a two-way, gravel access.

  The section of road needing upgrade is from the game land boundary to the existing parking lot. This road is approximately 0.1 miles and will have an estimated upgrade cost of $20,000.

South Mountain Game Land also has several high priority road upgrade needs. These include the following:

- Upper CCC Road (Eastern Portion)

  The eastern portion of the Upper CCC Road is a one lane, dirt road with severe erosion and stability concerns. This road needs significant attention and is the highest priority infrastructure project on SMGL. This section of road should be upgraded to match the condition of the western portion, which provides a one-lane gravel access with sufficient drainage.

The section of road needing upgrade is approximately 6.2 miles and will have an estimated upgrade cost of $1,300,000. Due to the large scale and high cost of this project it is uncertain when funding will be available to complete it.

- Woods Gap Road (Administrative Access)

  Woods Gap Road provides access into the center portion of SMGL from the end of Old CC Road (S.R. 1732). This road was recently improved to provide logging access to a private inholding in the game land. Although recently improved, the existing road is a one lane dirt path, with several incorrectly installed culverts. This road needs upgrade for administrative access, which would include a one lane gravel road, with the replacement and addition of culverts. This road improvement would be made from the existing parking lot/campground to the boundary of the 50-acre private inholding.

  The section of road needing upgrade is approximately 2.0 miles and will have an estimated upgrade cost of $350,000.

- Lone Mountain Road (Central Section)

  This is an existing administrative access road through the Lone Mountain Tract of the South Mountains Game Land. This road connects to Cane Creek Mountain Road (S.R. 1700) to the south and NC Hwy. 226 to the north. The majority of the road is grass/dirt in fair condition, but adequate for WRC staff usage. The central section of this road has severe problems with erosion and needs grading and the installation of several culverts. It is also recommended that this area have gravel added to provide an all-weather surface. This is a short section of road needing repair, but is in such a bad condition that it limits access.

  The section of road needing upgrade is approximately 0.1 miles and will have an estimated upgrade cost of $30,000.

- Bolin Knob Road

  This is an existing administrative access road through the western portion of the South Mountains Game Land. It is accessed off of US Hwy. 64 and Deer Farm Road. Deer Farm Road is private gravel road maintained by area residents and NCWRC, which leads to a parking area at the game land boundary. NCWRC holds a deeded ROW easement across Deer Farm Road. The road beyond the gate is currently a dirt/grass road. This road should be upgraded to provide a 10’ wide gravel road. There is one area that has experienced a washout and associated severe erosion and the road is in jeopardy of being lost. There is an approximately 25’ tall bank that needs to be repaired/stabilized to prevent future erosion. In addition, drainage should be improved near this washout with the addition of swales and/or culverts.

  The section of road needing upgrade is approximately 2.4 miles and will have an estimated upgrade cost of $360,000. The washout repair will have an estimated cost of $20,000.

Medium Priority

The above mentioned road at JRGL has the highest priority for repair over the next ten years. However, it is not the only road in need of upgrade on the game land. The following roads at JRGL are considered medium priority and should be repaired after the high priority project is completed.

- Fire Break off of Marsh Trail

  This existing fire break is used by NCWRC staff for administrative access. A public parking area is located where the firebreak intersects with Marsh Trail (S.R. 2209). A portion of this firebreak needs the addition of gravel to alleviate erosion issues and to provide an improved 10' wide access where the firebreak intersects with Marsh Trail and the parking area. There are also drainage problems around the parking lot. A new ditch should be installed to divert water around the lot and into the DOT right of way.

  The section of road needing repair and construction is approximately 0.15 miles and will have an estimated cost of $20,000.

- Lower Road through Loop Road Unit

  This is an existing gravel road, running just east of Johns River and west of Johns River Loop Road. This is a 10'-12' wide gravel road, which is in good overall condition. There are two areas along this road that need re-grading to solve drainage problems.

  This road repair has an estimated cost of $5,000.

- Drainage at intersection of Ragsdale Road and Antioch Road

  Ragsdale Road is in good condition, but there are some drainage problems at the intersection with Antioch Road. Water running down Ragsdale Road is not able to drain to the ditch within the DOT right of way which creates standing water at the intersection of Ragsdale and Antioch Roads during heavy rain events. This area should be re-graded, with the potential addition of a culvert, to ensure drainage of this intersection.

  This road repair has an estimated cost of $5,000.

South Mountain Game Land has the following medium priority road needs:

- Woods Gap Road (Through Inholding)

  Woods Gap Road provides connectivity from the southern portion of the game land to the Upper CCC Road. This road currently traverses a private 50 acre inholding, which is located at the intersection of this and the Upper CCC Road. This 50 acre inholding is a priority for future purchase, and if acquired, this road should be improved. It is currently a one lane dirt road, which should be upgraded to a one lane gravel road with improved drainage.

  The section of road needing upgrade is approximately 0.4 miles and will have an estimated upgrade cost of $80,000.

- Firebreak off of Jonestown Road for Administrative Access

  This is an existing fire line off of Jonestown Road (S.R. 1733), in the southern portion of SMGL. The firebreak is currently accessed across private property so a permanent easement should be investigated/acquired before any improvements are made. The existing firebreak is a dirt path with access and drainage concerns. This firebreak should be improved by grading and the addition of gravel to provide a one lane access. This firebreak should be used for administrative access and should not be open to public vehicular traffic.

  The section of road needing upgrade is approximately 0.3 miles and will have an estimated upgrade cost of $50,000.

- Lone Mountain Road (Southern Portion)

  This is an existing administrative access road through the Lone Mountain Tract of the South Mountains Game Land. This road ties to Cane Creek Mountain Road to the south and NC Hwy. 226 to the north. The majority of the road is grass/dirt, in fair condition, and adequate for NCWRC staff usage. The southern portion of this road needs to be upgraded from Cane Creek Mountain Road to the existing parking lot. The road should be cleared of vegetation and gravel added as needed to provide a one lane road.

  The section of road needing upgrade is approximately 0.2 miles and will have an estimated upgrade cost of $30,000.

- Administrative Access near Morganton Depot

  This is an existing administrative access road through the Leonard Farm Tract of SMGL. This road loops through the tract and provides access to two dams and several habitat improvements. The road is in fair condition but needs the addition of gravel in order to provide a one lane, all weather road.

The section of road needing upgrade is approximately 1.8 miles and will have an estimated upgrade cost of $180,000.

- Lower CCC Road (S.R. 1732)
  The Lower CCC Road is a DOT maintained gravel road. This road currently fords a small stream, which is not a preferred situation. A stream crossing should be installed in this location, which could include a culvert, bottomless culvert or a bridge. Options and funding for this improvement must be discussed with DOT. Installing a culvert in this location would have an approximate cost of $15,000. Installing a bridge in this area would have an estimated cost of $75,000.

Low Priority

There are no low priority roads that need repair on JRGL.

Other roads on SMGL that need upgrade, but are considered the lowest priority include the following:

- Upper CCC Road - Easement

  The western portion of the Upper CCC crosses private property for approximately one mile. An easement is needed for this crossing to ensure public access to the game land in the future.

  WRC staff maintains this road, therefore it is assumed that an easement could be acquired at no cost. However, contact should be made with the current land owners to discuss this acquisition.

- Grayson Creek Road

  This existing road provides administrative access into the southern portion of the South Mountains Game Land off of Camp McCall Road (S.R. 1729). This road crosses private property for approximately 0.6 miles and a ROW easement is desirable. Current administrative access across the private portion of this road is by handshake agreement. This access is currently dirt/gravel in fair condition but does have several areas of erosion. Approximately 0.5 miles of this road has some significant erosion issues and should be repaired even if an easement cannot be obtained across the private portion. If an easement is acquired, the entire road should be upgraded to a one lane gravel road with improved drainage.

  The section of road needing upgrade in the near future is 0.5 miles and will have an upgrade cost of $75,000. The entire road is approximately 2.3 miles and will have an estimated upgrade cost of $345,000 if an easement is acquired.

New Road Construction

There is one new road that should be constructed on JRGL.

- Administrative access, Loop Road Unit
  This future road should provide connectivity through the Loop Road Unit, between Johns River Loop Road and the road running parallel to Johns River. This would be a gated road which should only be accessible by WRC staff. This should be a one lane (10' wide) gravel road, with ditches and culverts as necessary.

  This future road would be approximately 0.1 miles and will have an estimated cost of $20,000.

There are no new roads proposed for SMGL.

Road Maintenance

All roads require inspection and maintenance to function well and avoid damage and deterioration. Maintenance should be performed regularly, as the longer the delay in needed maintenance, the more damage will occur and the more costly the repairs will be.

<u>Typical Road Maintenance Practices</u>

- Inspect roads regularly, especially before the winter season and following heavy rains.
- Keep ditches and culverts free from debris (see also Culvert Maintenance Section of this Plan).
- Remove sediment from the road or ditches where it blocks normal drainage.
- Regrade and shape the road surface periodically to maintain proper surface drainage.
  - Typical road should be crowned at approximately 4%, or ½" per foot.
  - Some roads may not require a crown, but should have a constant cross slope (super-elevation).
  - Gravel should be distributed at an even depth across the road.
  - Gravel should have an even distribution of fine and course materials.
  - Keep downhill side of the road free of berms, unless intentionally placed to control drainage.
  - Proper maintenance and grading of the road will require a motorgrader and a roller.
- Avoid disturbing soil and vegetation in ditches, shoulders, and cut/fill slopes to minimize erosion.
- Maintain shoulders on both sides of the road to ensure oncoming vehicles have enough room to pass. Shoulders should be relatively flat, with a mowed grass surface.
- Maintain erosion-resistant surfacing such as grass or rip rap in ditches.

- If it is determined that a road needs major repairs or upgrades, contact Regional Supervisor and Design Services to schedule an assessment.

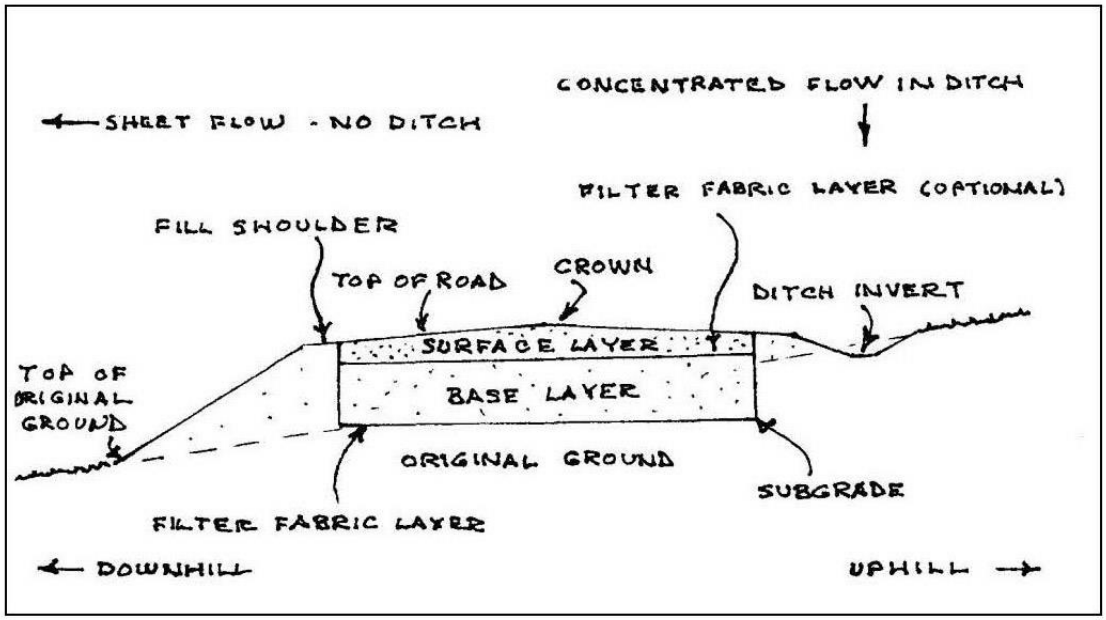


Figure 1 - Typical Road Cross-Section – Canaan, NH Highway Department

Road Safety Features

- Remove trees and other vegetation as necessary to provide adequate sight distance and clear travel way.
- Install and maintain road signage. This includes:
  - Stop signs –Should be installed at every intersection, with the signs on the minor roads.
  - Warning signs – Should be installed to warn the public of any road closures or problems in the game land.
  - Road/Route signs – Should be installed at every road intersection on a game land.
  - Information kiosks with game land road map – Entry signs should be installed at every entrance to a game land off of a DOT road. Information kiosks should be located near the entrances and in parking areas.

Gates

Gates are used on game lands to direct and limit public vehicular traffic, reduce infrastructure maintenance costs, limit disturbance to wildlife and to protect wildlife habitat improvements. For maintenance purposes, gates should be used to limit access to roads that are unsafe or are in disrepair, to limit use on roads to certain times during the year to minimize the wear and deterioration of the road, and to meet wildlife habitat management objectives. If a road is

considered unsafe or in disrepair, field staff should contact an engineer. The engineer will perform an inspection to determine the best course of action to repair or upgrade the road.

All gates on both game lands should be constructed of steel pipe with protected locks and painted orange for maximum visibility. No cable gates should be installed, and any existing cables should be replaced.

Troubleshooting

Road Surface Problems

Problem: Longitudinal erosion of the road surface
Possible Causes:

- Flat or U-Shaped road. A crown or super-elevation of the road is needed to shed water laterally off the outer edges of the road surface
- Small ridge of soil or grass growth along the outer edge of the road is preventing water from draining off the road surface. Edge needs to be graded to remove this ridge.
- Water is traveling in a wheel rut. Road needs to be regarded. This problem often results from soft roads.
- Road ditch is not large enough and overflows onto road surface. Install more frequent turnouts to get water away from the road or increase the size of the ditch.

Problem: Lateral erosion cutting across the road surface
Possible Causes:

- Most often occurs at a low spot in the road or where a ditch filled in and no longer functions. Water builds up and overtops and erodes the road surface. A culvert should be installed in this location.

Problem: Potholes
Possible Causes:

- Potholes are typically caused by insufficient crown or road cross slope. The road should be re-graded to remove the potholes, then re-crown or super-elevate the road as necessary.

Ditch Problems

Problem: Bottom of ditch is eroding
Possible Causes:

- Slope of ditch is too steep to handle the flow without additional protective measures, which include addition vegetation, erosion control mats, rip rap, check dams, etc.
- Ditch is too small to handle the volume of water flowing through it. May need to install periodic turnouts to reduce flow through the ditch.
- Bottom of ditch is too narrow and needs to be widened to a parabolic shape.

Problem: Sides of ditches are slumping or eroding
Possible Causes:

- Side slopes are too steep and need to be lessened by digging the back.

- Side slopes need to be stabilized with additional vegetation, erosion control mat, or rip rap.

Parking Areas

Johns River Game Land has 2 designated parking areas in the Loop Road Unit and 10 parking areas in the Lower Creek Unit. Most of the parking areas on the game land are in good condition, but the following need improvement:

- Parking Lot at end of Old Johns River Road

  This parking lot has been designed and is planned for construction with the current Johns River Loop Road project. This gravel parking lot will serve six vehicles and will be complete in early 2015.

- Parking Lot at end of Putnam Street

  Putnam Street (S.R. 1569) provides public access to the northern portion of the Lower Creek Unit. A new gravel parking lot to serve three to five vehicles is needed at the end of this road. This parking lot would require clearing of vegetation, minor grading, and graveling. This improvement would cost approximately $10,000.

- Parking Lot at end of Valley View Road

  Valley View Road is a high priority road improvement planned for JRGL (see above). A new gravel parking lot to serve three to five vehicles is needed at the end of this road once the improvement is completed. This parking lot would require clearing of vegetation, minor grading, and graveling. This improvement would cost approximately $10,000.

South Mountains Game Land has 2 designated parking areas on the Leonard Farm Tract, 1 on the Black Fox Tract, and ten parking areas on the remainder of the game land. Most of the parking areas on the game land are in good condition, but the following need improvement:

- Parking Lot off Pheasant Creek Road

  This existing parking lot is in poor condition. It needs to be cleared of vegetation and have gravel added. The parking lot also needs signage along Pheasant Creek Road (S.R. 1535) as it is currently unmarked. This improvement would cost approximately $10,000.

Gates

Lockable gates are generally installed at or near the entrance of each NCWRC maintained access road and in other locations where warranted. Gates are used on game lands to direct and limit public vehicular traffic, reduce infrastructure maintenance costs, limit disturbance to wildlife, and to protect wildlife habitat improvements.

Gates should be used to limit access to roads that are unsafe or are in disrepair and to limit public use on roads to certain times during the year to minimize the wear and deterioration of the road and to meet wildlife and habitat management objectives. If a road is considered unsafe or in disrepair, field staff should contact an engineer. The engineer will perform an inspection to determine the best course of action to repair or upgrade the road.

All gates on both game lands are constructed of steel pipe with protected locks and are in good condition. All gates installed on both game lands should be painted orange for maximum visibility. No cable gates should be installed, and any existing cables should be replaced. Additional gates will be installed as needed and as future infrastructure improvements dictate.

Dam and Impoundment Assessment

Dams

Johns River Game Land has no lakes/ponds or associated dams that require inspection for this management plan.

South Mountains Game Land has three ponds on the Leonard Farm Tract near the Morganton Wildlife Depot. For the purpose of this assessment, the existing outlet works and dam embankments have been investigated to determine overall condition of the structure. Recommendations for maintenance and possible future construction needs have also been included.

- Broughton Farm Pond Dam #1

Broughton Farm Pond Dam (from Dam Safety)	
Identification	BURKE-020/ NC01947
Hazard Classification	Low
Year Built	Unknown
Dam Height (ft)	20
Hydraulic Height (ft)	16
Freeboard (ft)	4
Crest Length (ft)	500

Crest Width (ft)	14
Upstream Slope	2.5
Downstream Slope	3.0
Normal Pool Elevation	N/A
Normal Pool Area (ac)	N/A
Normal Pool Storage Capacity (ac-ft)	Unknown
Max. Storage Capacity (ac-ft)	Unknown
Drainage Area (ac)	Unknown
Maximum Discharge (cfs)	Unknown
Condition Assessment	Fair
Last Inspection Date	2/13/2012

Broughton Farm Pond #1 is classified by Dam Safety and shown in the NC Dam Safety Inventory. The pond is located just south of the Morganton Depot on the Leonard Farm Tract of the South Mountains Game Land. The outlet structure of the pond is located at 35° 40' 32.385"N, 81° 41' 2.215" W. The dam consists of an earthen embankment. At the time of inspection, there was vegetation but no large trees on the embankment. The alignment of the dam seems to be straight, and no erosion, undermining, ruts, slides, cracks, seepage, wetness or rodent burrows were observed. However, it is recommended to mow the embankment to eliminate the chance of trees growing large enough to negatively impact the dam. The pond outlet structure is located at 35° 40' 32.385"N, 81° 41' 2.215"W and consists of a small brick riser and outlet pipe. The emergency spillway is located at 35° 40'32.5"N, 81° 41'03.4"W.

- Broughton Farm Pond Dam #2

Broughton Farm Pond Dam (from Dam Safety)	
Identification	BURKE-021/ NC01948
Hazard Classification	Low
Year Built	Unknown
Dam Height (ft)	28
Hydraulic Height (ft)	23.5
Freeboard (ft)	4.5
Crest Length (ft)	500
Crest Width (ft)	14
Upstream Slope	2.5
Downstream Slope	3.0
Normal Pool Elevation	N/A
Normal Pool Area (ac)	N/A
Normal Pool Storage Capacity (ac-ft)	Unknown

Max. Storage Capacity (ac-ft)	Unknown
Drainage Area (ac)	Unknown
Maximum Discharge (cfs)	Unknown
Condition Assessment	Fair
Last Inspection Date	2/20/2013

Broughton Farm Pond #2 is classified by Dam Safety and shown in the NC Dam Safety Inventory. The pond is located just southwest of Broughton Farm Pond #1 and the Morganton Depot on the Leonard Farm Tract of the South Mountains Game Land. The dam consists of an earthen embankment. At the time of inspection, there was vegetation but no large trees on the embankment. The alignment of the dam seems to be straight, and no erosion, undermining, ruts, slides, cracks, seepage, wetness or rodent burrows were observed. However, it is recommended to mow the embankment to eliminate the chance of trees growing large enough to negatively impact the dam. The pond outlet structure is located at 35° 40' 27.273"N, 81° 41' 5.52" W and consists of a small brick riser and outlet pipe. The emergency spillway is located at 35° 40' 28.0" N, 81° 41' 5.60" W.

- Unnamed Pond

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the western portion of the Leonard Farm Tract of the South Mountains Game Land, just east of Windy Acres Road. The outlet structure of the pond is located at 35° 40' 14.70" N, 81° 41' 38.87" W. The dam consists of an earthen embankment. At the time of inspection, there was extensive vegetation and a few trees on the embankment. These trees need to be removed and other vegetation mowed down to prevent future damage to the embankment. The alignment of the dam seems to be straight, and no erosion, undermining, ruts, slides, cracks, seepage, wetness or rodent burrows were observed.

The pond outlet consists of a small concrete riser and outlet pipe. The riser box is too small and is in poor condition, with vegetation growing from the top. In addition, this pond did not appear to have an emergency spillway. During times of high flows, it appears that water would overtop the dam, which can cause erosion to the embankment. A new, larger concrete outlet structure is recommended for this pond, as well as a concrete block emergency spillway, which can still allow administrative vehicle passage.

Impoundments

Neither Johns River Game Land nor South Mountain Game Land has impoundments that require inspection for this management plan.

NCWRC explored the possibility of constructing waterfowl impoundments at JRGL on the Loop Road Unit when the property was acquired. Extensive testing by NCWRC staff, Ducks Unlimited staff, and the Natural Resources Conservation Service indicated that the soil would

not hold water without extensive and cost prohibitive measures. Additionally, portions of the Loop Road Unit desirable for the construction of waterfowl habitat improvements flood routinely and any construction would have to withstand repeated flooding. NCWRC, however, will continue to explore the feasibility of providing waterfowl habitat improvements on JRGL.

Dam/Impoundment Maintenance

Dams are complex structures that consist of many parts (see Figure 2). In order to prevent failures, dams must be inspected to identify potential problems, and maintenance must be performed to prevent deterioration of the structure that may result in failures. Because of their complexity, dams can fail in many ways including, but not limited to, overtopping, seepage failure, and structural failure.

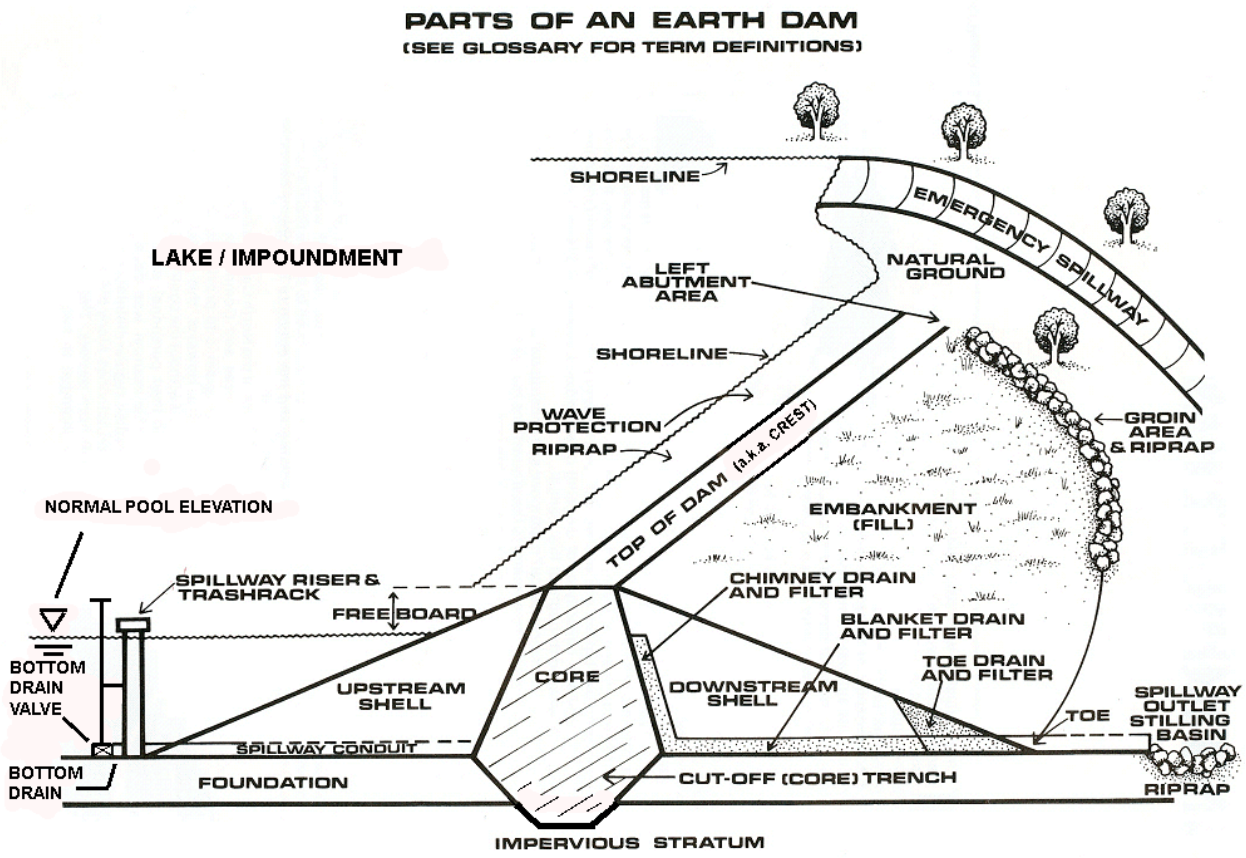


Figure 2 – Parts of an Earthen Dam (from Dam, Operation, Maintenance, and Inspection Manual – NCDENR Land Quality Section)

Periodic Inspection of dams is very important. Dams should be thoroughly visually inspected by technician staff at least twice a year, once in the summer and once in the winter. A closer inspection of the embankment can be made in the winter when the vegetation is dormant and in

the summer after the embankment has been mowed. An engineer should be contacted after the embankment has been mowed. Ideally, an engineer will inspect the dam once per year. An engineer should be contacted any time of the year if a problem is observed. Each component of the dam should be inspected for problems, and corrective action should be taken as necessary. Records of inspections and corrective measures should be kept on hand to monitor any problems that may be observed. Checklists for inspections are available in the "Dam, Operation, Maintenance, and Inspection Manual" published by the NC Department of Environment and Natural Resources.

A healthy stand of grass should be maintained on the dam embankment, toe, groin, top (if a road is not present), and in the emergency spillway to prevent erosion. Shrubs and woody vegetation should not be allowed on the embankment or in the spillway. Roots can cause seepage paths, and trees that fall can leave large holes that can weaken the dam. Brush and trees can also make it difficult to visually inspect the embankment for other issues, and they also provide a haven for burrowing rodents. They also prevent grass growth. As such, all trees, shrubs, and bushy vegetation should be removed from the dam. Embankments should be mowed at least once a year with equipment capable of navigating the potentially steep slopes and capable of removing small woody growth. Emergent vegetation on the shoreline of the embankment should also be controlled. Commercial herbicides can be used in these areas, however all application instructions, environmental precautions, and safety practices should be followed.

Any and all erosion observed on the embankment, on the groin, and in the emergency spillway should be addressed immediately. Vegetation should be re-established in the eroded area by adding soil as necessary and installing topsoil and fertilizer if necessary prior to seeding. Turf reinforcing mat may also be required to stabilize the repair. The cause of the erosion should also be addressed. The upstream face/shoreline of the embankment should also be checked for erosion. This may be caused by wave action. These areas should be repaired immediately by excavating out the eroded material and installing filter fabric and rip rap to prevent further damage.

Dam inspections should also address seepage that is observed. Seepage can occur anywhere on the downstream face, around principal spillway pipes, or beyond the toe of the dam. Seepage may vary in appearance from a soft, wet area to a flowing spring. These areas may show up as areas where the vegetation is more lush and darker green. Marsh or wetland vegetation may also be present in these areas. Seepage can lead to weakening of the embankment evidenced by slides caused by soil saturation or pressures in the soil pores. Seepage can also lead to piping, or the movement of soil particles, which can lead to dam failure. A continuous or sudden drop in the water level may also be an indication that seepage is occurring. Regular inspections and record keeping (seepage flow rates, water levels, content of flow, size of wet areas, and type of vegetation growth) are important to monitor the seepage conditions to determine whether the seepage is steady or in a state of change. If seepage is observed, an engineer should be notified.

The embankment should also be inspected for cracks, slides, sloughing, and settlement. Short, isolated cracks are not usually significant, however larger (wider than ¼ inch), well-defined cracks indicate problems. Transverse cracks that appear across the embankment may be due to differential settlement, and they can provide paths for seepage and piping. Longitudinal cracks that appear parallel to the embankment may indicate the early stages of a slide. Small cracks should be filled to prevent water intrusion. Slides are serious threats to dam safety as they can lead to instability of the embankment and failure. If a slide develops, the water level should be lowered to investigate of the cause and facilitate the construction of a repair. An engineer should be contacted to examine all cracks, slides, and settlements observed.

During the dam inspection, evidence of rodents (groundhogs, muskrat, and beavers) should be noted. Burrows can weaken the embankment and serve as pathways for seepage. Beavers can also plug spillways causing the water level to rise above the design level. Rodents should be removed from the dam by acceptable means and burrows should be filled. Trash racks, spillways, and other outlets should be inspected for clogging and cleaned as necessary.

Roads on top of dams should be maintained to prevent damage to dam embankments. They should be constructed using a proper base and wearing surface. If a wearing surface is not constructed, traffic should not be allowed on the dam during wet conditions. Water trapped in ruts can lead to saturation and weakening of the embankment. A wearing surface will prevent or minimize ponding water and infiltration. A wearing surface should be constructed to drain into the impoundment, and storm water runoff should not be concentrated at one point.

Principal spillway pipes should be inspected thoroughly once a year. They should be inspected for improper alignment (sagging), elongation and displacement at joints, cracks, leaks, surface wear, loss of protective coating, corrosion, and blockage. Special attention should be paid to pipe joints. The pipe should also be checked for signs of water seeping along the outside. Small or minor problems can be patched, however major problems may require replacement of the pipe. An engineer should be contacted if problems with the pipe are observed. Erosion at the pipe outlet should also be inspected. Severe undermining can lead to pipe joint displacement and weakening of the dam embankment. Rip rap may be installed to mitigate against continued erosion, however an engineer should be contacted if there is severe erosion. Inspection reports should be kept to monitor the progression of any observed problems.

Riser structures should be thoroughly inspected at least once a year. They should be examined for spalling and deterioration. Any cracking, staining, exposed reinforcing bars, and broken out sections that are observed should be further examined as this may lead to structural instability. They should also be checked for alignment and settlement. Mechanical equipment such as valves, gates, stems, and couplings should be inspected for corrosion, broken, or worn parts. It would also be good to operate these devices at least once a year to ensure that they are functioning and seating properly. An engineer should be contacted if problems in riser structures are observed, and they should be addressed immediately.

Trash racks and flashboards should be inspected on a more frequent basis. Clogging of these features can lead to higher water levels that may compromise the stability of the dam. Clogs should be cleared and all trash should be removed. If possible, the cause of the clogging

should be identified and addressed. Broken trash racks and boards should be repaired or replaced. Broken trash racks can allow trash and debris to enter the riser and/or principal spillway pipe and can lead to clogging of these features.

Vegetated emergency spillways should be inspected at least twice per year (at the same time as the embankment). Spillway should be mowed to prevent trees, brush, and weeds from becoming established and to promote the growth of grass. Any erosion should be repaired immediately, and any obstructions should be removed. Periodic reseeding and fertilization may be necessary to avoid erosion and bare areas.

Concrete and other lined emergency spillways should be thoroughly inspected at least once a year. Concrete should be inspected for floor or wall movement, improper alignment, settlement, joint displacement, undermining, and cracking. Structural repairs should begin by removing all unsound concrete. Cracks must be repaired carefully to prevent water intrusion. An engineer should be notified if any structural problems are observed with the spillway. Rip rap lined spillways should be inspected for erosion and displacement of stone. All woody vegetation should be removed, and any obstructions should be removed. Inspection forms and notes should be kept to monitor the progression of any observed deficiencies.

It is important to keep detailed and accurate records of all observations, inspections, maintenance, rainfall and pool levels, drawdowns, and other operational procedures. These records can aid in monitoring the progression of deficiencies as well as diagnosing problems. More information on dam inspections, operation, and maintenance can be found in the “Dam, Operation, Maintenance, and Inspection Manual” prepared by NCDENR Division of Land Resources Land Quality Section.

Culvert Assessment

There are a limited number of culverts on JRGL, with most being in good condition. During the infrastructure inspection with field staff, one culvert was identified as needing to be installed.

- Road through Loop Road Unit, parallel to Johns River (from Medium Priority list)

  There are drainage problems along this road, approximately 0.7 miles west from the intersection with the Johns River Loop Road. Water currently drains across the road from the central portion of the Loop Road Unit. A new culvert should be appropriately sized and installed in this location to prevent any future road erosion. The estimated cost of this culvert installation is $5,000.

South Mountain Game Land also has a limited number of culverts, but several issues were identified as needing replacement or installation.

- Large culvert on northern boundary of Leonard Farm Tract

There is an existing (approximately) 60” CMP is the stream along the western boundary of the Leonard Farm Tract, and located at 35° 40’ 38.00” N, 81° 41’ 24.76” W. This culvert has washed out and has experienced severe erosion. This culvert should be completely removed and the slopes of the channel should be armored with rip rap. There is no need for this culvert to be replaced. The estimated cost of this culvert removal and shoreline stabilization is $15,000.

- Culverts on western boundary of Leonard Farm Tract

  There are 2 culverts on the western boundary of the Leonard Farm Tract that need replacement due to wear and tear. This project will adequately size and install these pipes to ensure proper drainage. The estimated cost of this culvert replacement project is $10,000.

- Multiple culverts on Lone Mountain Tract

  There are multiple culverts along the Little First Broad River in Lone Mountain Area of the South Mountain Game Land. These pipes range from 18” to 60” CMP and all need to be replaced. Some of these have failed, while others have inadequate slope for fish passage. There is currently a project in progress with Inland Fisheries to replace these culverts. This project will adequately size and install these pipes to ensure fish passage. The estimated cost of this culvert replacement project is $50,000.

Example of culvert needing resizing/replacement on Lone Mountain Tract.

Culvert Maintenance

Culvert maintenance is performed to extend the life and ensure proper function of the installed drainage structure. The accumulation of sediment and/or debris at the inlet or outlet of a culvert or damage such as crimping of the pipe effectively reduces the diameter and flow capacity of the pipe.

Culvert maintenance includes removal of accumulated sediment and/or debris that prevents passage of water (and organisms) through culvert inlets, outlets and connected drainage ways. It may also include reinforcement of eroding inlets and outlets by installing riprap or other erosion control measures. Damaged culverts and culverts requiring frequent repeat maintenance should be considered for future remediation via redesign and reinstallation.

The following items should be checked for and addressed as part of routine maintenance inspections:

- partial or complete blockage of the inlet or outlet of the pipe with sediment, stone, leaves, woody debris, refuse or any other items that could affect flow through the culvert
- evidence of scour, bank or channel bed erosion near the inlet or outlet of the culvert
- evidence of flow overtopping the road at the culvert location
- damage to the pipe including crimping of the inlet or outlet, crushing or piercing of the pipe
- severe corrosion of the pipe
- damage to headwalls

Staff should inspect ditches and culverts as part of their regular road maintenance activities. This inspection is especially important during leaf fall and following periods of heavy rain. Staff should consider the location of the culvert before performing maintenance using heavy equipment. Culverts located in active stream channels, dedicated or critical habitat areas may require special permission or installation of erosion control measures before maintenance can commence.

Leaves and woody debris that have accumulated in or around the inlet of the culvert should be removed immediately using hand tools if possible. Removal of accumulated silt and/or gravel from ditches approaching the culvert inlet should be performed using a small excavator, backhoe or a tractor equipped with a scrape blade. Sediment in or around the immediate vicinity of the pipe inlet or outlet should be removed using hand tools to prevent damaging the culvert. Cleaned out material is to be pulled away from the culvert then hauled and spread at a site where it cannot be washed back to the culvert area.

Repeat problems with sediment collecting around the inlet may indicate the existence of an erosion problem originating from the slopes, streams or ditch lines in the vicinity of the culvert. Identification and stabilization of these problem areas through practices such as seeding or matting could improve performance of the culvert and reduce maintenance requirements.

Flow overtopping the road at the culvert location generally indicates that the pipe is undersized and could warrant resizing and replacement. Any damage to the culvert, as described above, may also necessitate replacement of the pipe. If maintenance staff identifies any culverts that may need replacement, they should contact engineering staff to calculate the peak flow capacity and diameter of the new pipe.

Recreational Facilities

Both JRGL and SMGL offer a variety of opportunities for public recreation. This section will review existing recreation facilities and identify sites for potential new development.

Boating Access Areas

The Johns River Boating Access Area is located just outside the boundary of JRGL. This access area is owned by Duke Power and maintained by NCWRC. This access area provides free, public access to Johns River and Lake Rhodhiss downstream. There are no other opportunities for water access within the Johns River Game Land.

There is no navigable water located on SMGL. Due to this, there is no feasible way to provide boating access (motorboat or canoe/kayak).

Public Fishing Areas

There are currently no public fishing areas located on JRGL. The Johns River flows through the game land so there are potential bank/pier fishing opportunities. This should be further

investigated by both Engineering and Inland Fisheries staff. If a suitable location is identified, a pier could be constructed for approximately $25,000.

The Broughton Farm Pond Public Fishing Access Area is located on the Leonard Farm Tract of SMGL. This includes both a floating fishing pier and a fixed fishing pier on two separate ponds. Upgrades to the access area have recently been made and no additional upgrades are currently warranted. There are no other water bodies on SMGL that will accommodate a public fishing area.

Shooting Ranges

There are currently no shooting ranges located on JRGL or SMGL. Johns River Game Land is a smaller game land, with many adjacent residences and provides minimal opportunities for a shooting range. South Mountains Game Land is much larger, however potential opportunities for a range are limited due to steep topography and proximity of residences.

Hiking

While neither JRGL nor SMGL has designated hiking trails, hikers can use administrative access roads, firebreaks, and old woods roads for hiking. Additionally hikers do occasionally hike from South Mountains State Park into SMGL along the Upper CCC Road.

Hiking is a popular use of many game lands and demand for this activity is anticipated to increase in the future. It is recommended that staff work on a long term plan to identify and construct hiking trails where feasible and desired. Construction of hiking trails may be accomplished by WRC or through partnerships with hiking clubs and conservation groups. Routine maintenance of hiking trails should be accomplished through agreements with conservation partners.

Horseback Riding

A 13.7 mile designated horseback riding trail is located on SMGL. This trail is open May 16-August 31 and traverses the Upper CCC Road for the entirety of its length. Year round opportunities for horseback riding are provided at South Mountains State Park and horseback riders from the park often connect to the trail on SMGL in season. Maintenance of the horseback trail occurs in conjunction with annual maintenance of the Upper CCC Road.

Due to a lack of graveled roads of sufficient length to accommodate horseback riding, no designated riding trails are provided on JRGL.

Camping

There are currently no designated campsites located within the Johns River Game land.

South Mountains Game Land currently has 3 designated primitive campsites. Two are located along the Upper CCC Road and 1 at the end of Old CC Road (S.R. 1732). Two additional campsites may be established within SMGL. These campsites would be unimproved and not be vehicle accessible. Cost for their establishment would be minimal.

As with hiking, camping is a very popular activity throughout the state. Additional camp site opportunities should be investigated throughout both JRGL and SMGL. Any future camp sites will be unimproved and be used by both hunters and recreational hikers/campers.

Recreational Facility Maintenance

Maintenance of recreational facilities is critical to the overall operation of the game land program. Typical use of the game lands is dispersed, however, recreational facilities concentrates users on a specific area or feature. This concentration of users, whether it is a boating access, fishing access, shooting range, or other use, results in a need to ensure the facility is safe and functional. Routine site visits for inspection and maintenance will accomplish this goal. Site visits should consist of two actions: (1) Inspection for safety issues and functionality; (2) Actual maintenance activities.

1. Inspections should examine the following items
   a. Safety inspection items:
      Facility components
      - Decking
      - Handrails
      - Structural supports (piles, substructure, and floats)
      - Fasteners (bolts, screws, and nails)

      Slip or trip hazards
      - Uneven walking surfaces
      - Mud on walking surfaces
      - Ponded water on walking surfaces
      - Drop offs

      Overhead
      - Dead trees or limbs
      - Overhead utilities

   b. Functionality Inspection Items

Parking

- Surface condition (ruts, potholes, gravel)
- Delineation (wheel stops, paint)

Ramp

- Blockages (sediment, wood)
- Surface condition

Pier/Dock

- Bollards
- Wooden components
- Bumpers

Shooting range

- Berms
- Target area
- Benches
- Shelter (roof, structure, and floor)

Signage

- Kiosk (entrance, regulation and information)
    - ADA (Americans with Disabilities Act)
    - No Parking
    - Keep Ramp Clear

2. Maintenance activities should include routine and corrective activities
    a. Routine Activities include:
        - Litter and debris removal
        - Grass mowing
        - Woody vegetative growth control
    b. Corrective activities can include but not be limited to:
        - Lumber replacement
        - Sign replacement
        - Minor grading
        - Tree or limb removal

Over time recreational facilities degrade to the point that routine maintenance activities cannot provide corrective action. Examples of this level of degradation include but are not limited to: structural problems, persistent and/or severe erosion issues, and broken/or severely degraded concrete. Once this level of degradation is reached, supervisory personnel should inspect the facility and determine the scope of the needed repairs. If major repairs are required supervisor personnel should contact an engineer for assistance.

PUBLIC USES

Primary public uses of state owned game lands include hunting, fishing, trapping, wildlife viewing and nature study. All other uses of state owned game lands are considered secondary uses and are evaluated using the Game Lands Use Evaluation Procedure to determine their compatibility with primary uses (see Appendix 4).

A public input meeting regarding the use and management of JRGL and SMGL was held in Morganton on 8/25/14. The public was also given the opportunity to provide input regarding both game lands via the agency website (see Appendix 5). Input received from the public as well as staff working knowledge was used to guide and prepare the sections below.

Hunting/Trapping

Hunters and trappers are considered primary users of JRGL and SMGL. Management strategies should include those that maintain the current number of hunters on these game lands or provide additional opportunities. Trapping currently occurs at low levels on both game lands. Any management strategies that encourage trapping should be implemented. Improvements to current infrastructure (see Infrastructure section) as well as acquisition of properties or easements that provide entry to areas that are currently difficult to access on both game lands will provide continued or additional opportunity for hunting and trapping. It should be noted that of those that attended the public meeting or provided comments online, approximately 90% indicated that the current level of access was sufficient on JRGL and 60% felt that the current level of access is satisfactory on SMGL. This should be taken into consideration when planning for access improvements on both game lands. Management strategies that continue to enhance disabled hunter opportunities will be pursued on both game lands. A focus on active habitat management on both game lands will ensure that adequate numbers of game species are present. Challenges to providing quality hunting and/or trapping include conflicts with hikers and other hunters/trappers as well maintaining adequate levels of game species to provide for reasonable hunter success rates.

NCWRC staff reviews operation of Huntmaster lift during a disabled sportsman hunt, Johns River Game Land.

Fishing

JRGL contains ample fishing opportunities for riverine and reservoir species such as largemouth bass, smallmouth bass, walleye, muskellunge, striped bass, and various sunfish and catfish species. All streams on SMGL are Public Mountain Trout Waters and are classified as Wild Trout Waters. Additionally, two ponds are located on SMGL and managed as Public Fishing Access areas. These ponds are stocked with channel catfish once a month from May through October.

Wildlife Viewing

Wildlife viewing includes activities such as birding, wildlife photography, and general wildlife viewing. Wildlife viewers are considered a primary user group on both JRGL and SMGL. Management strategies to increase the number of wildlife viewers that utilize both game lands should be implemented. Strategies to increase and enhance wildlife viewing opportunities include: directional signage along roads that provide access to both game lands, informational signage regarding wildlife viewing opportunities at key access locations (i.e., parking areas), and adding signage at kiosks that indicate the best times of the year for wildlife viewing.

Additionally, NCWRC plans to make JRGL part of the “N.C. Birding Trail” and explore opportunities to enhance the SMGL portion of the “N.C. Birding Trail”. Involving birding groups with special projects and directly publicizing the birding trails to birding groups will increase public awareness of opportunities on both game lands. Infrastructure improvements needed to better facilitate this and other user groups are noted above. The continuation of active habitat management where feasible and allowed and as outlined in the “Habitats” section of the plan will ensure a diversity and adequate numbers of wildlife species are present on both game lands and will serve to keep viewer interest high. Developing specific habitat improvements along bird trails and near parking areas will be explored. The primary challenge to provide a quality wildlife viewing experience include conflicts with other user groups on the game land.

Other Outdoor Recreation

The most popular outdoor recreational pursuits at JRGL include hiking, photography, and canoeing. At SMGL the most popular activities are hiking, horseback riding, and photography. In addition, activities such as mountain biking and geocaching occur at lower levels on both game lands. All of these users are considered secondary users of the game land.

Hiking is a popular activity on both JRGL and SMGL and occurs year-round. Although developed hiking trails are not established on either game land, undesignated trails, old woods roads, firebreaks, and administrative access roads are all utilized for hiking. Specific requests from hikers were not received via public comment. The development of partnerships between hiking groups and NCWRC that allow for trail construction and/or maintenance are encouraged. The establishment of any new trails would need to be made on a case by case basis to ensure that new trails do not create excessive erosion issues, are not in violation of the Natural Heritage dedication, and do not displace or create excessive conflicts with primary game land users. Conflicts between hunters and hikers occasionally occur. Providing information on kiosks at key access locations may help reduce this source of conflict among user groups.

Horseback riding on a 13.7 designated trail is currently allowed on SMGL from May 15 to August 31. This horseback riding trail connects to designated horseback riding trails on South Mountains State Park offering this user group additional opportunity. Minimal requests regarding horseback riding were received via public comment for SMGL. Conflicts between horseback riders and hikers occasionally occur but are thought to be minimal. Conflicts between horseback riders and hunters should not occur due to the separation of times when these activities are allowed. Horseback riding trails are currently not provided on JRGL due to a lack of suitable roads (graveled) of sufficient length to provide this activity. Requests for horseback riding were not received via public comment for JRGL. Extensive opportunities for horseback riding in the region are found on the Pisgah National Forest and at South Mountains State Park.

Camping occurs at SMGL at 2 designated campgrounds along the Upper CCC Road and at 1 designated campground on the Lower CCC Road. The primary function of these campgrounds

is to provide game land users with a place to either park a camper or sleep in the back of their truck during multiple day stays on the game land. Requests were made at the public input meeting to allow “backcountry” camping on SMGL. NCWRC is considering establishment of 2-3 “backcountry” campsites on SMGL at strategic, remote locations. Establishment of additional backcountry camping opportunities would depend on the success of the initial 2-3 sites. Camping is not offered at JRGL and no requests were received to provide this opportunity at JRGL. Conflicts between campers and other game lands users should be minimal.

Photographers are currently utilizing both JRGL and SMGL. This activity can be enjoyed on year round on both game lands. The current level of this activity should be maintained. Conflict between photographers and hunters, horseback riders, and hikers may occur. These conflicts are thought to be minimal, however.

Canoeing is enjoyed on JRGL along the Johns and Catawba Rivers and along Lower Creek when sufficient flow is present. A boating access area is planned for construction several miles north of JRGL, which will likely increase canoeing opportunity on the game land. This activity should be encouraged on the game land. Conflicts between those canoeing and those hunting waterfowl may occur, but conflicts should be minimal since most canoeing likely occurs in the warmer months, while waterfowl hunting is mostly confined to the late fall and winter months.

Mountain biking currently occurs on both JRGL and SMGL, but only at low levels. Increased levels of mountain biking should not be encouraged on either game due to a lack of suitable trails to ride on, conflicts with hikers, hunters, and wildlife watchers, and the potential to create erosion problems. Increased levels of mountain biking should also be discouraged since it can degrade wildlife habitat improvements, especially in sensitive areas. Ample opportunities for mountain biking can be found on the nearby Pisgah National Forest and this activity should not be featured on either JRGL or SMGL.

Geocaching is an activity where participants use Global Positioning Systems or other mobile devices to hide and seek containers called “caches”. All geocaching activities will need to be consistent with the Geocaching Policy adopted by the NCWRC (December 4, 2014). Public comments regarding this activity were not received but geocaching likely occurs at low levels on both game lands. Any caches located in hazardous locations can potentially put others in a dangerous situation trying to find the cache and brings up numerous liability issues. Geocaching can continue to occur at current levels, but some restrictions may need to be implemented. Conflicts between hunters and geocachers may occasionally occur. Providing information on kiosks at key access locations may help reduce this source of conflict between user groups.

INFORMATION NEEDS

Current State of Knowledge

- Waterfowl impoundments contour map and design overview, JRGL
- Cost estimate for Johns River wetland restoration (impoundments), JRGL
- Site soil assessment for waterfowl impoundments, JRGL
- Test impoundment data, JRGL
- Permit hunt surveys, JRGL
- Forest inventory and stand mapping (Crescent Land and Timber Company generated), JRGL
- Sportfish survey data, JRGL
- Priority fish monitoring (targeting state listed or rare species), JRGL
- Annual breeding songbird survey, SMGL
- Annual summer Northern bobwhite call count, SMGL
- Winter songbird survey, SMGL
- Vegetation survey, SMGL
- Northern bobwhite useable habitat survey, SMGL
- Fall Northern bobwhite covey count, SMGL
- Ruffed grouse spring drumming count, SMGL
- Restoration of Southern Blue Ridge Fire Learning Network priority fire dependent forest communities, SMGL
- Priority fish and crayfish monitoring (targeting state listed or rare species), SMGL
- Stream crossing inventory (culverts, bridges, etc.), SMGL
- Big game harvest records, JRGL and SMGL

Wildlife/Habitat Inventory and Monitoring Needs

White-tailed deer and wild turkey are featured big game species on both JRGL and SMGL. Big game harvest records are an important tool utilized to monitor population levels and trends and make management decisions. However, additional surveys (camera traps, hunter surveys, etc.) would augment current information and help NCWRC staff better manage and make more informed decisions about appropriate harvest levels for both species. Using camera traps to estimate deer density and hunter numbers and effort, combined with registered kill would provide the key ingredients of a complete deer management program.

Waterfowl hunting is popular at JRGL. Hunter surveys and waterfowl counts are warranted there.

We currently lack adequate information regarding small mammals (including bats), amphibians and reptiles on both game lands. General surveys to inventory and monitor these species and their habitats are warranted. More specifically, surveys to monitor bog turtles on JRGL and the South Mountains gray-cheeked salamander on SMGL are needed. A survey to monitor breeding birds on JRGL is needed. Monitoring of muskellunge on JRGL is needed as well as a trout monitoring program on SMGL. With basic inventory information on these species and their associated habitats, we can develop target species population levels and develop habitat management strategies to achieve those levels where feasible.

While invasive plants are present on both game lands, neither JRGL nor SMGL have any invasive species that are well established. It is important to monitor and control invasive species that are present on both game lands and to rapidly detect and eradicate new invasive species before they become entrenched. Enhanced monitoring of invasive species is needed to identify problem areas and better guide control strategies and efforts.

Monitoring land use and community planning efforts adjacent both game lands is needed. This includes local government land use, long range transportation plans, zoning changes, and new commercial and residential development. To the extent that these uses and plans may affect the success of game land management goals and objectives, appropriate bodies should be informed how to minimize impacts to the game land where possible. Monitoring of local development and transportation plans and proposed projects in terms of how they may affect important wildlife corridors between regional conservation lands is also important.

Wildlife/Habitat Management Needs

Habitat management needs are summarized within each habitat section and goals described in the “desired future conditions” subsections. Updated forest inventory and stand maps are needed for JRGL. The overall management objective for JRGL will focus on restoration and enhancement of critical habitats and communities including oak forest, early successional

communities, wetlands diversity, and various aquatic habitats. The overall management objective for SMGL will again focus on restoration and enhancement of critical habitats and communities including oak forests, early successional communities, rock outcrops, and various aquatic habitats. Researching areas for development of critical habitat types and monitoring the success and impacts of habitat and community restoration activities will be needed.

Species specific management focus on both game lands will continue to be on popular game species. Muskellunge, waterfowl, white-tailed deer, wild turkey, mourning dove, and cottontail rabbit will be featured game species at JRGL. Target game species at SMGL will be trout, white-tailed deer, wild turkey, mourning dove, Northern bobwhite, and cottontail rabbit. WAP priority species will be managed for on both game lands along with threatened and endangered plants and a diversity of songbirds for viewing.

User Group Needs

- Enhance opportunities for wildlife watchers (N.C. Birding Trail, etc.), JRGL/SMGL
- Better monitor numbers of deer, turkey, waterfowl, and small game hunters, JRGL/SMGL
- Identify and access potential shooting range locations, JRGL/SMGL
- Monitor hiking activity – where, who, how much, when?, JRGL/SMGL
- Monitor use by birders/wildlife watchers, JRGL/SMGL
- Develop list of any commercial users and monitor any commercial use, JRGL/SMGL
- Research to determine user group dynamics, JRGL/SMGL
- Research to monitor habitat degradation by game land users, JRGL/SMGL
- Perform comprehensive user survey, JRGL/SMGL

FINANCIAL ASSETS AND FUTURE NEEDS

Current Assets

The current level of staffing is adequate to meet the objectives of the plan. The current staffing is indicated below.

- 1 Ecoregion Supervisor
- 1 Wildlife Forester
- 1 Land Management Biologist
- 1 Conservation Technician Supervisor
- 4 Conservation Technicians
- 1 District Fisheries Biologist
- 1 Assistant District Fisheries Biologist
- 1 Aquatic Diversity Coordinator
- 1 Aquatic Diversity Biologist
- 1 Wildlife Diversity Supervisor
- 4 Wildlife Diversity Biologists
- 9 Wildlife Enforcement Officers
- 1 Field Engineer
- 2 Temporary Technicians

No staff are dedicated solely to JRGL or SMGL.

Current Costs/Funding Needs

Current and future estimated expenditures (adjusted for projected inflation rate) for managing JRGL and SMGL through 2027 are presented in Tables 3 and 4 on the following pages.

Johns River Game Land																
Financial Summary of Activities																
Habitat Activities																
					Unit											
Project	**Description**	**Activity**	**Quantity**	**Unit**	**Cost**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**Total**
H	Development of Clearings	Wildlife Opening Establishment	1	ac	$ 3,000	3000	3074	3151	3229	3309	3391	3475	3561	3650	3740	$ 33,579
H	Firebreaks	Construct firebreaks	1	mi	$ 3,000	3000	3074	3151	3229	3309	3391	3475	3561	3650	3740	$ 33,579
H	Firebreaks	Maintain firebreaks	2	mi	$ 700	1400	1435	1470	1507	1544	1582	1622	1662	1703	1745	$ 15,670
H	Herbaceous Planting	Planting/Maintenance	30	ac	$ 200	6000	6149	6301	6458	6618	6782	6950	7122	7299	7480	$ 67,159
H	Herbaceous Planting	Planting/Maintenance (dove fields)	18	ac	$ 400	7200	7379	7562	7749	7941	8138	8340	8547	8759	8976	$ 80,590
H	Nesting Structures	Nest Box Maintenance	40	ea	$ 25	1000	1025	1050	1076	1103	1130	1158	1187	1217	1247	$ 11,193
H	Trees and Shrubs	Planting/Maintenance	80	ea	$ 6	480	492	504	517	529	543	556	570	584	598	$ 5,373
H	Vegetation Control	Invasive Plant Control	1	ac	$ 200	200	205	210	215	221	226	232	237	243	249	$ 2,239
H	Vegetation Control	Prescribe burning	90	ac	$ 30	2700	2767	2836	2906	2978	3052	3128	3205	3285	3366	$ 30,221
															Subtotal	$ 279,604
Operation and Maintenance Activities																
					Unit											
Project	**Description**	**Activity**	**Quantity**	**Unit**	**Cost**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**Total**
O & M	Stream Crossings	Replace Culvert	1	ea	$ 2,500	2500	2562	2626	2691	2757	2826	2896	2968	3041	3117	$ 27,983
O & M	Public Use Facilities	Maintain parking areas	13	ea	$ 500	6500	6661	6826	6996	7169	7347	7529	7716	7907	8103	$ 72,755
O & M	Road and Trails	Maintain gates	4	gate	$ 150	600	615	630	646	662	678	695	712	730	748	$ 6,716
O & M	Road and Trails	Maintain roads	3	mi	$ 3,500	10500	10760	11027	11301	11581	11868	12163	12464	12773	13090	$ 117,528
O & M	Signs and Boundaries	Maintain boundary	3.5	mi	$ 400	1400	1435	1470	1507	1544	1582	1622	1662	1703	1745	$ 15,670
															Subtotal	$ 240,652
Development Activities																
					Unit											
Project	**Description**	**Activity**	**Quantity**	**Unit**	**Cost**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**Total**
D	Drainage Structure	Install Culvert, Loop Road Unit	1	ea	$ 5,000	5000										$ 5,000
D	Parking Area Upgrade	Putman Street	1	ea	$ 10,000		10248									$ 10,248
D	Parking Area Construction	Valley Veiw Road	1	ea	$ 10,000	10000										$ 10,000
D	Road Upgrade	Valley View Road	0.1	mi	$ 20,000	20000										$ 20,000
D	Road Upgrade	Marsh Trail Firebreak	0.15	mi	$ 20,000		20496									$ 20,496
D	Correct Drainage Problem	Lower Loop Rd. Unit Road	1	ea	$ 5,000	5000										$ 5,000
D	Correct Drainage Problem	Ragsdale Road	1	ea	$ 5,000	5000										$ 5,000
D	New Road Construction	Access to ADA Food Plot #1	1	ea	$ 20,000			21448								$ 21,448
															Subtotal	$ 97,192
														Grand Total		**$ 617,448**

Table 3. Estimated current and future expenditures for managing Johns River Game Land through 2028.

South Mountains Game Land																
Financial Summary of Activities																
Habitat Activities																
					Unit											
Project	**Description**	**Activity**	**Quantity**	**Unit**	**Cost**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**Total**
H	Firebreaks	Construct firebreaks	0.5	mi	$ 3,000	1500	1537	1575	1614	1654	1695	1738	1781	1825	1870	$ 16,790
H	Firebreaks	Maintain firebreaks	10	mi	$ 700	7000	7174	7352	7534	7721	7912	8108	8309	8516	8727	$ 78,352
H	Herbaceous Planting	Planting/Maintenance	31	ac	$ 200	6200	6354	6511	6673	6838	7008	7182	7360	7542	7729	$ 69,397
H	Herbaceous Planting	Planting/Maintenance (dove fields)	20	ac	$ 400	8000	8198	8402	8610	8824	9042	9267	9497	9732	9973	$ 89,545
H	Nesting Structures	Nest Box Maintenance	25	ea	$ 25	625	641	656	673	689	706	724	742	760	779	$ 6,996
H	Vegetation Control	Prescribe burning	920	ac	$ 30	27600	28284	28986	29705	30441	31196	31970	32763	33575	34408	$ 308,930
															Subtotal	$ 570,009
Operation and Maintenance Activities																
					Unit											
Project	**Description**	**Activity**	**Quantity**	**Unit**	**Cost**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**Total**
O & M	Bridges	Replace Culvert	1	ea	$ 2,500	2500	2562	2626	2691	2757	2826	2896	2968	3041	3117	$ 27,983
O & M	Public Use Facilities	Maintain parking areas/campgrounds	11	ea	$ 500	5500	5636	5776	5919	6066	6217	6371	6529	6691	6857	$ 61,562
O & M	Road and Trails	Maintain gates	5	gate	$ 150	750	769	788	807	827	848	869	890	912	935	$ 8,395
O & M	Road and Trails	Maintain roads	12	mi	$ 3,500	42000	43042	44109	45203	46324	47473	48650	49857	51093	52360	$ 470,110
O & M	Signs and Boundaries	Maintain boundary	10.5	mi	$ 400	4200	4304	4411	4520	4632	4747	4865	4986	5109	5236	$ 47,011
															Subtotal	$ 615,061
Development Activities																
					Unit											
Project	**Description**	**Activity**		**Unit**	**Cost**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**Total**
D	Parking Area Upgrade	Pheasant Creek Road	1	ea	$ 10,000	10,000										$ 10,000
D	Drainage Structure	Culvert Removal, Leonard Farm Tract	1	ea	$ 15,000		15,372					22,976				$ 38,348
D	Drainage Structure	Culvert Replacements, Lone Mtn. Tract	7	ea	$ 7,200	50,400										$ 50,400
D	Drainage Structure	Culvert Replacements, Leonard Farm Trac	2	ea	$ 5,000		10,248									$ 10,248
D	Washout Repair	Bolin Knob Road	1	ea	$ 20,000					20,496						$ 20,496
D	Crossing Structure	Lower CCC Road (S.R. 1732)	1	ea	$ 75,000								80,580			$ 80,580
D	Road Upgrade	Grayson Creek Road	2.3	mi	$ 345,000							396,336				$ 396,336
D	Road Upgrade	Grayson Creek Road	0.5	mi	$ 75,000					82,440						$ 82,440
D	Road Upgrade	Leonard Farm Tract Road	1.8	mi	$ 180,000						202,320					$ 202,320
D	Road Upgrade	Upper CCC Road	6.2	mi	$ 1,300,000									1,300,000		$ 1,300,000
D	Road Upgrade	Woods Gap Road	2	mi	$ 350,000			367,360								$ 367,360
D	Road Upgrade	Lone Mtn. Road (Central)	0.1	mi	$ 30,000								30,000			$ 30,000
D	Road Upgrade	Bolin Knob Road	2.4	mi	$ 360,000										368,928	$ 368,928
D	Road Upgrade	Woods Gap Road (Private Section)	0.4	mi	$ 80,000			83,968								$ 83,968
D	Road Upgrade	Jonestown Rd. Firebreak	0.3	mi	$ 50,000		53,720									$ 53,720
D	Road Upgrade	Lone Mtn. Road (Southern)	0.02	mi	$ 30,000					32,976						$ 32,976
															Subtotal	$ 3,128,120
														Grand Total		**$ 4,313,190**

Table 4. Estimated current and future expenditures for managing South Mountains Game Land through 2028.

ACQUISITION PLAN

Priority property acquisitions for JRGL and SMGL are identified in Figures 1 and 2 respectively. It should be noted that NCWRC only acquires property from willing sellers and does not pursue property condemnation. Tracts identified as “high priority” for acquisition are currently owned by Duke Ventures, LLC. These are large tracts that would significantly increase the size of JRGL, solidify State ownership in the immediate area, and enhance connectivity of current holdings. These tracts may become available for acquisition per the Federal Energy Regulatory Commission (FERC) relicensing agreement for operation of hydroelectric dams by Duke Energy on the upper Catawba River. NCWRC should pursue acquisition of any of these tracts if they do indeed become available. Areas identified as “multiple tracts/residential” are areas containing multiple tracts with many owners. Many tracts within these areas contain residential development and are not well suited for State ownership. Acquisition of individual tracts within these areas may address an access or specific conservation need. These tracts, if available for acquisition, should be evaluated on an individual basis to determine their value as additions to JRGL. Tracts near the game land that are not identified on the map and are offered for acquisition should be evaluated on a case by case basis to determine if they address a significant game land and/or conservation need.

In a broader sense, any properties offered for acquisition should be evaluated for providing connectivity or a corridor among regional conservation lands (Figure 3). Tracts that provide critical habitat for threatened or endangered species should be pursued also.

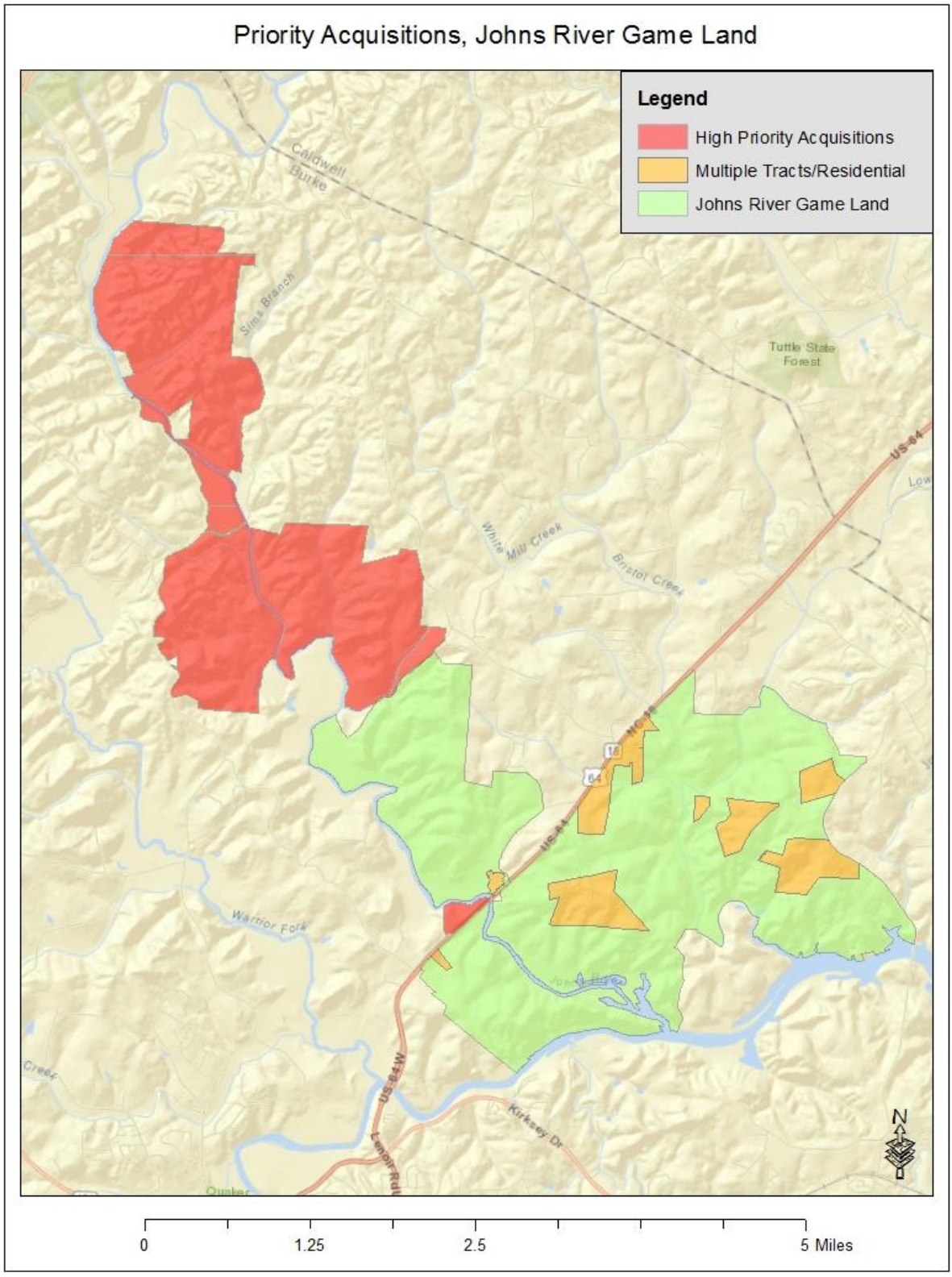


Figure 1. Priority Acquisitions, Johns River Game Land

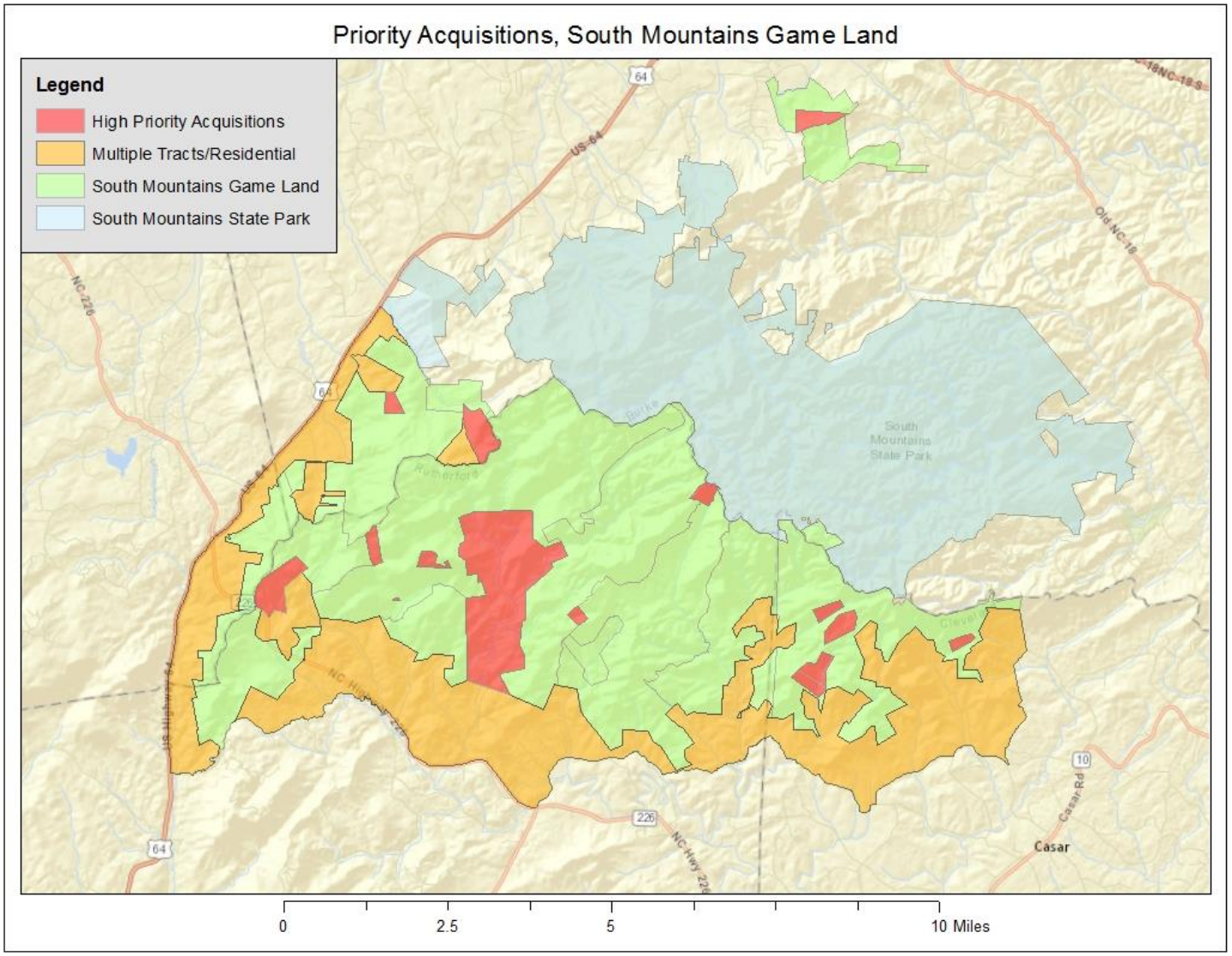


Figure 2. Priority Acquisitions, South Mountains Mountain Game Land

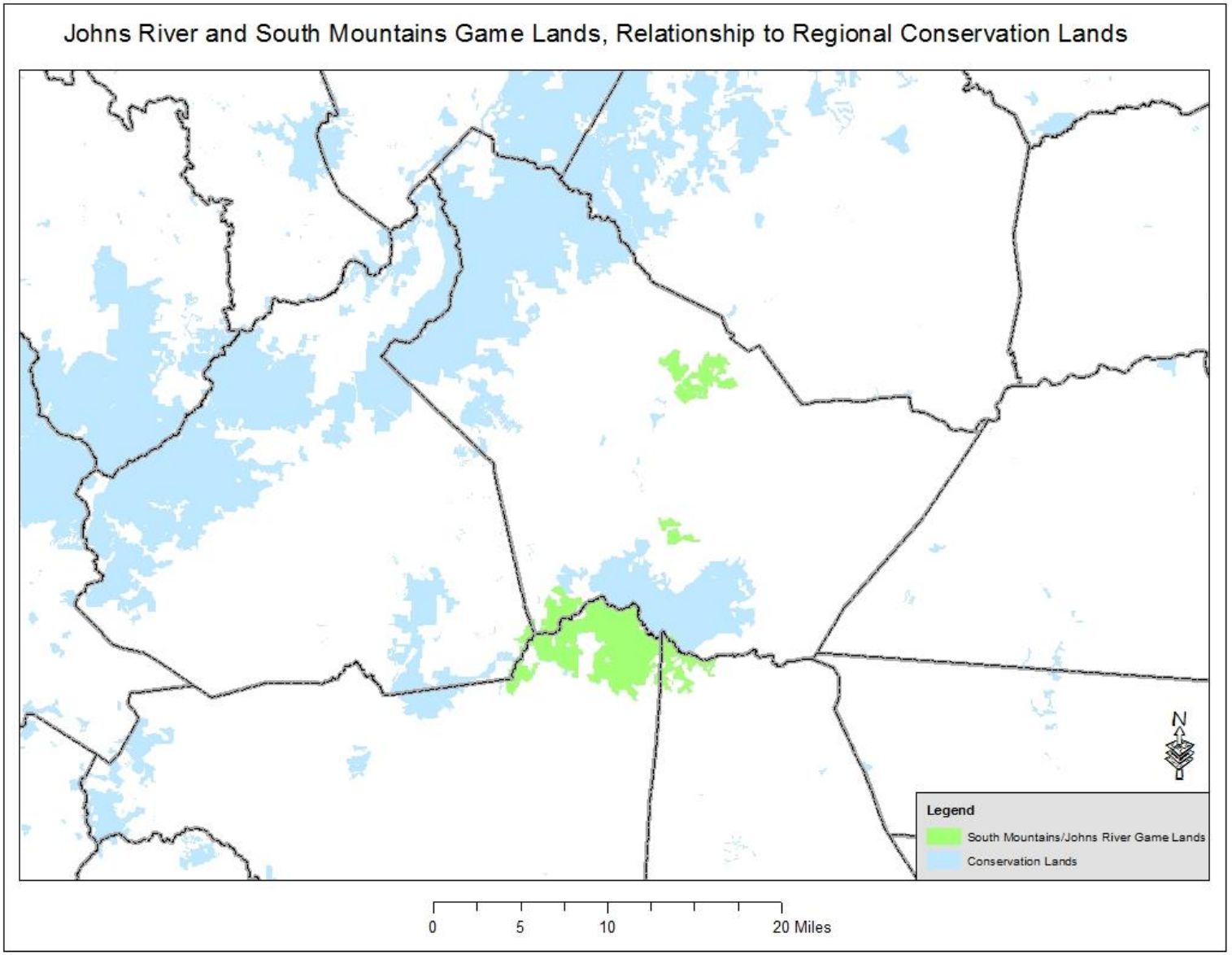


Figure 3. Johns River and South Mountains Game Lands, Relationship to Regional Conservation Lands

REGULATIONS/ENFORCEMENT

The following regulations and enforcement issues are identified.

- Require all users to have game land use permit (statewide policy should be developed for all game lands)
- Unauthorized removal of protected species from the game land, JRGL/SMGL

PARTNERSHIPS

Partnerships with the groups identified below to accomplish plan objectives should be maintained or explored.

- North Carolina State Parks, SMGL
- Western Carolina University, SMGL
- Southern Blue Ridge Fire Learning Network, SMGL
- The Nature Conservancy, SMGL
- Foothills Conservancy of North Carolina (land acquisition), JRGL/SMGL
- National Wild Turkey Federation, JRGL/SMGL
- Ducks Unlimited, JRGL
- Audubon Society, Carolina Birding Club; JRGL/SMGL
- Equestrian Groups, Hiking Clubs: JRGL/SMGL

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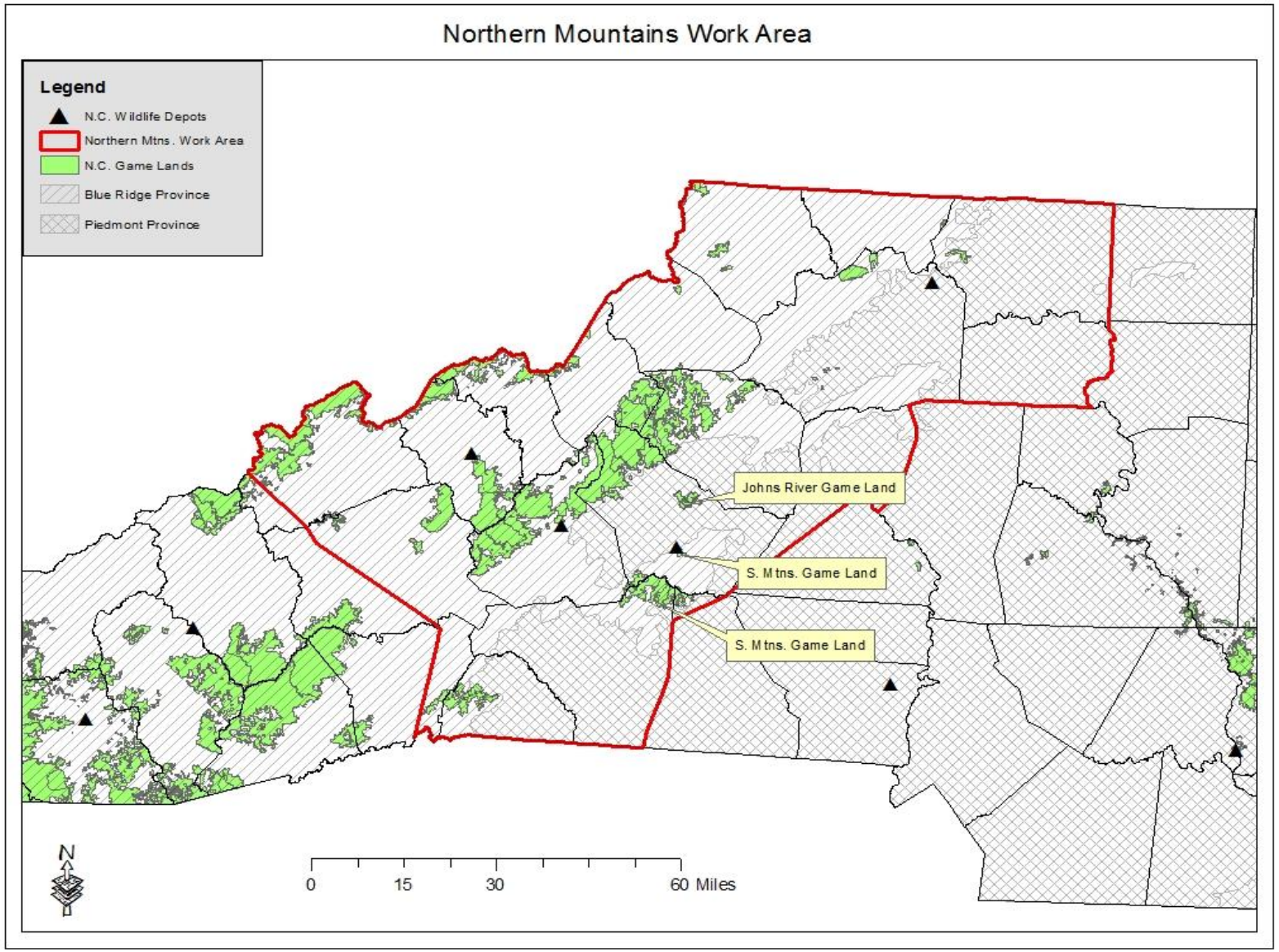
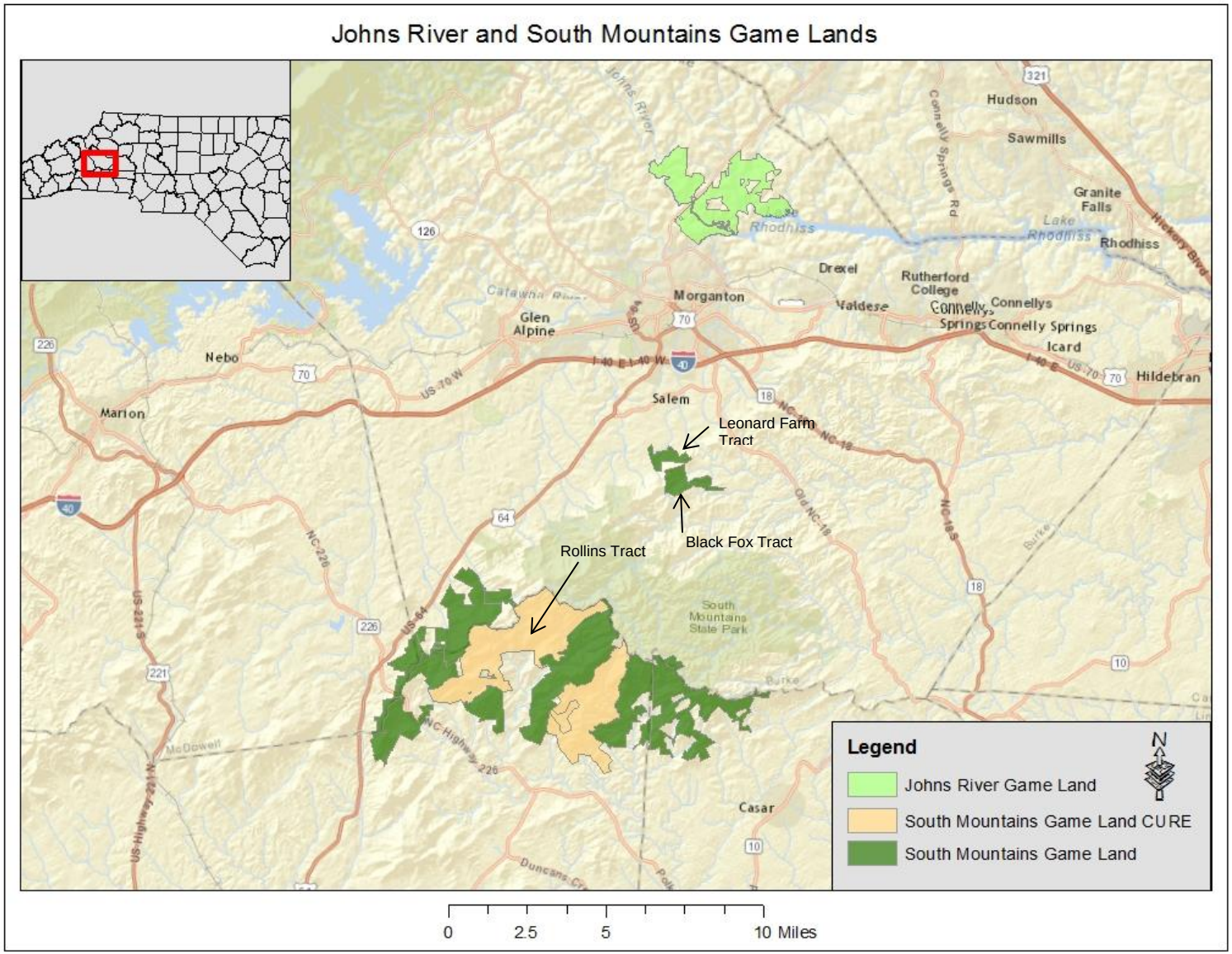
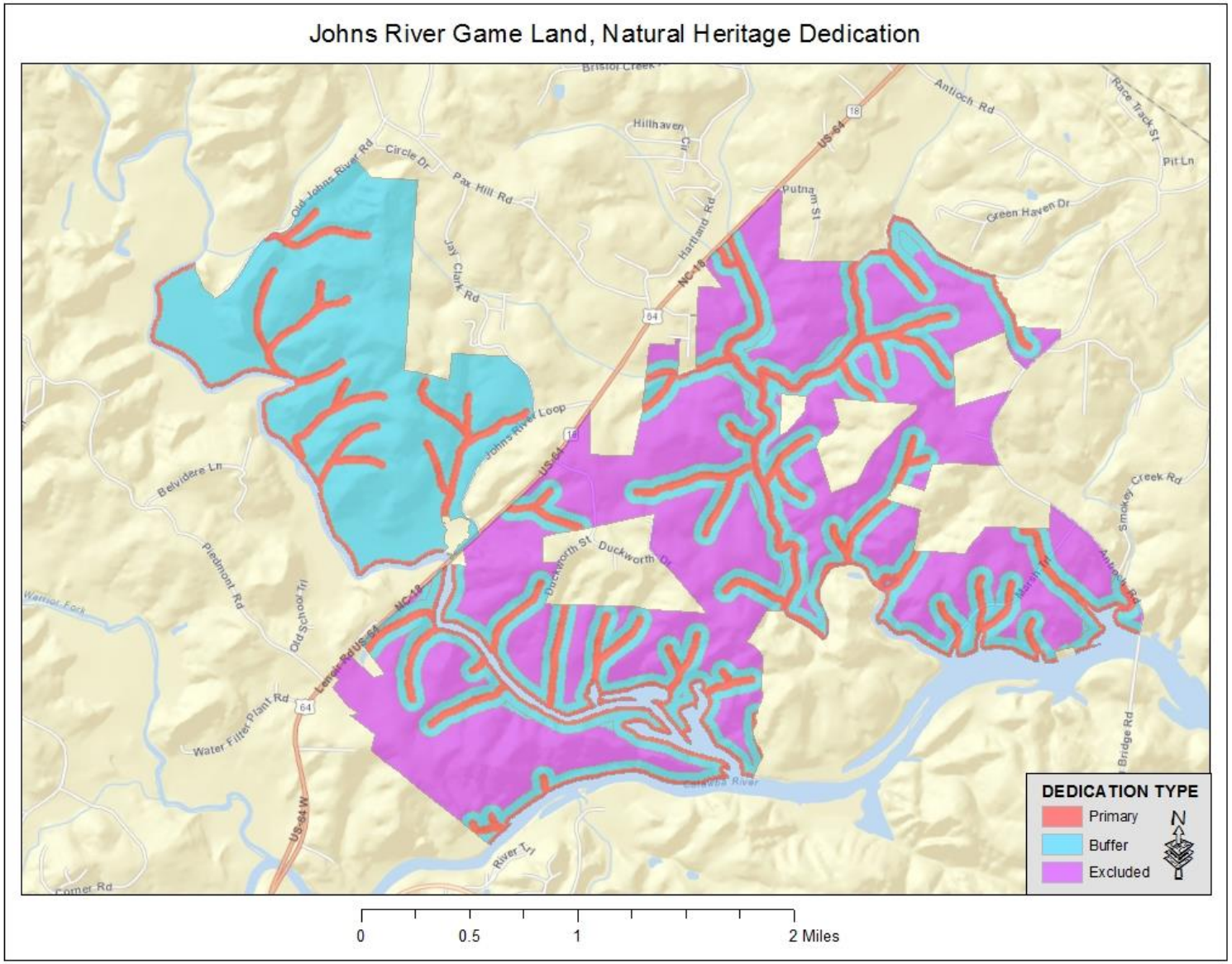
APPENDIX 1 –MAPS



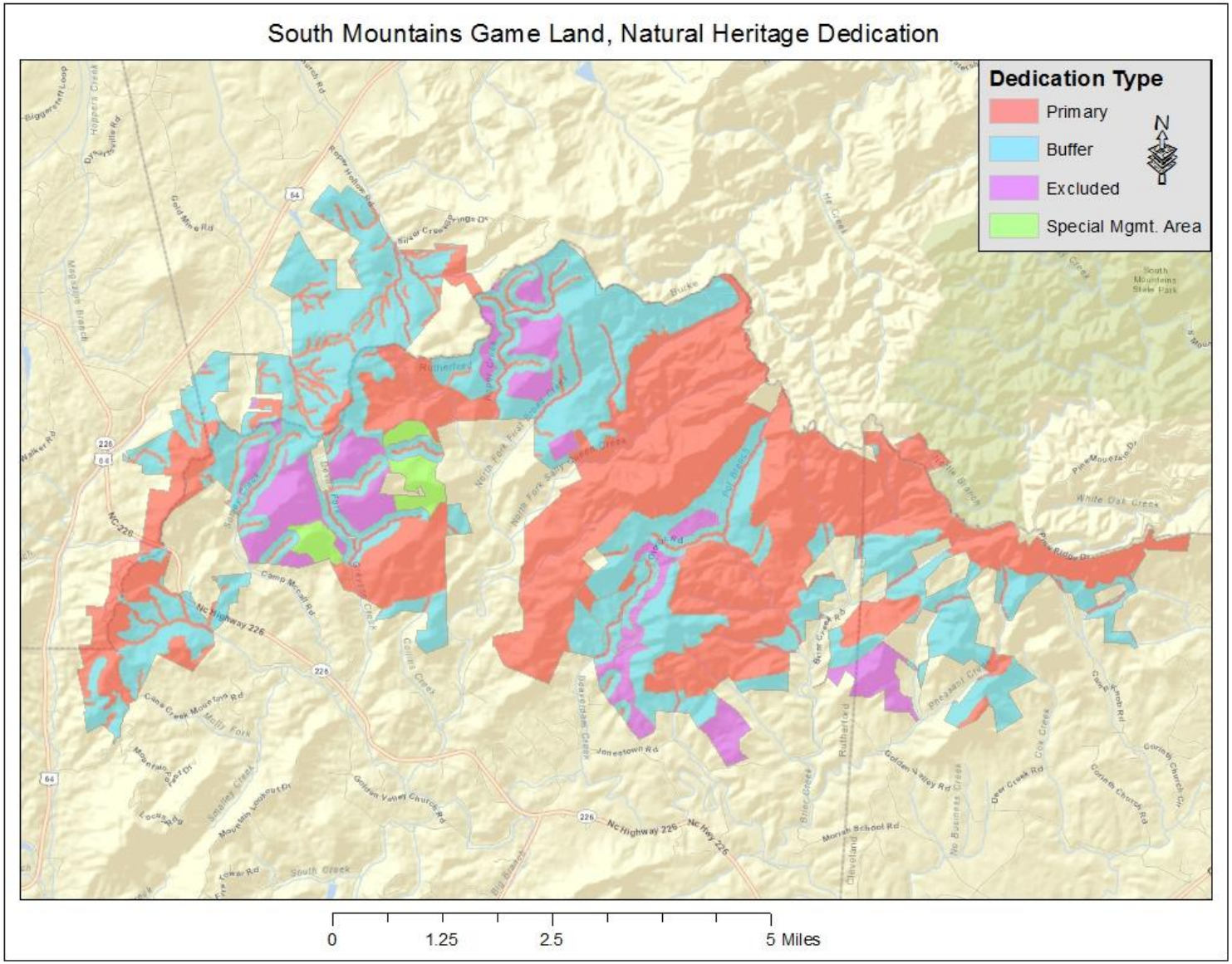
Map 1. Northern Mountains Work Area.



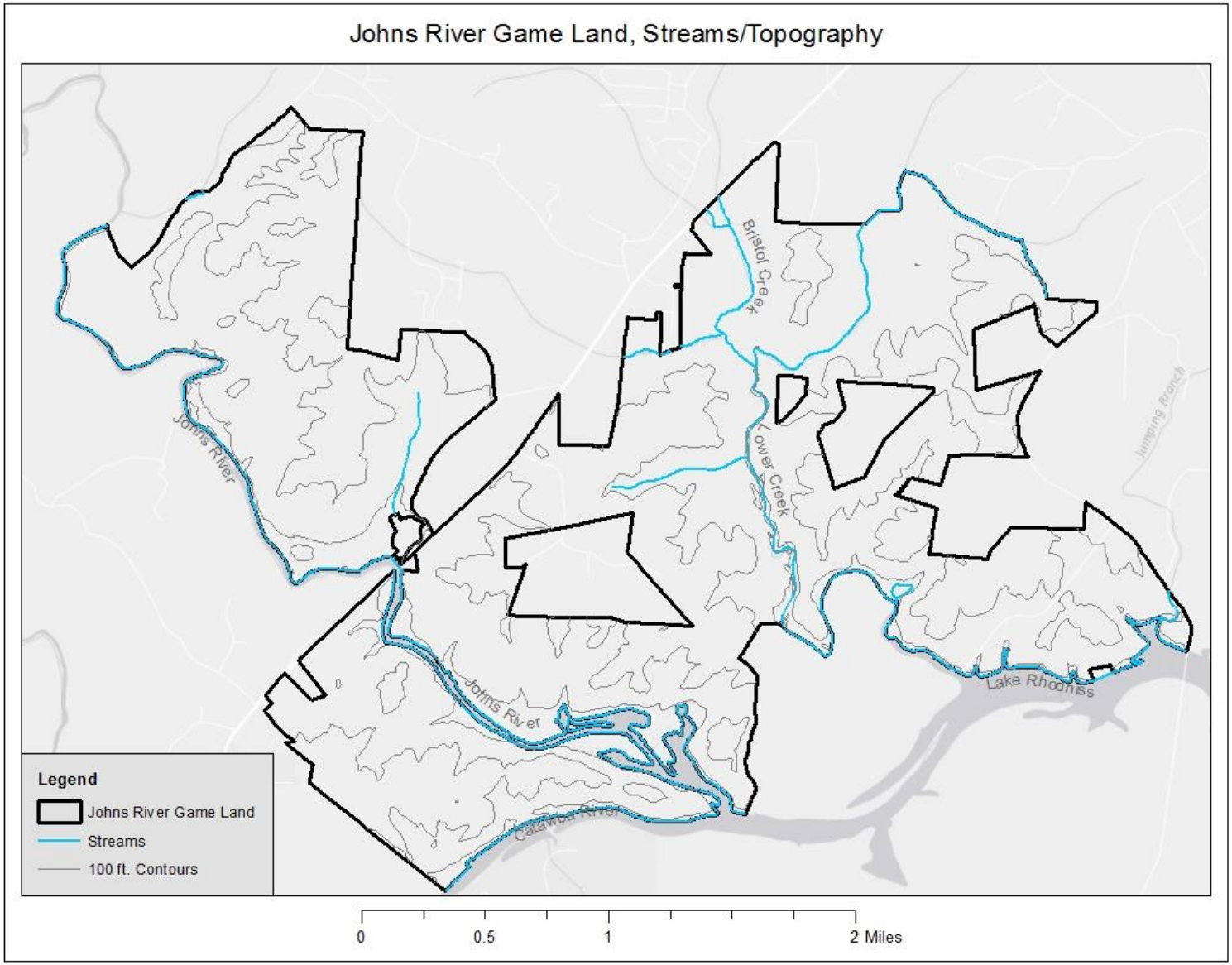
Map 2. Johns River and South Mountains Game Lands, Location.



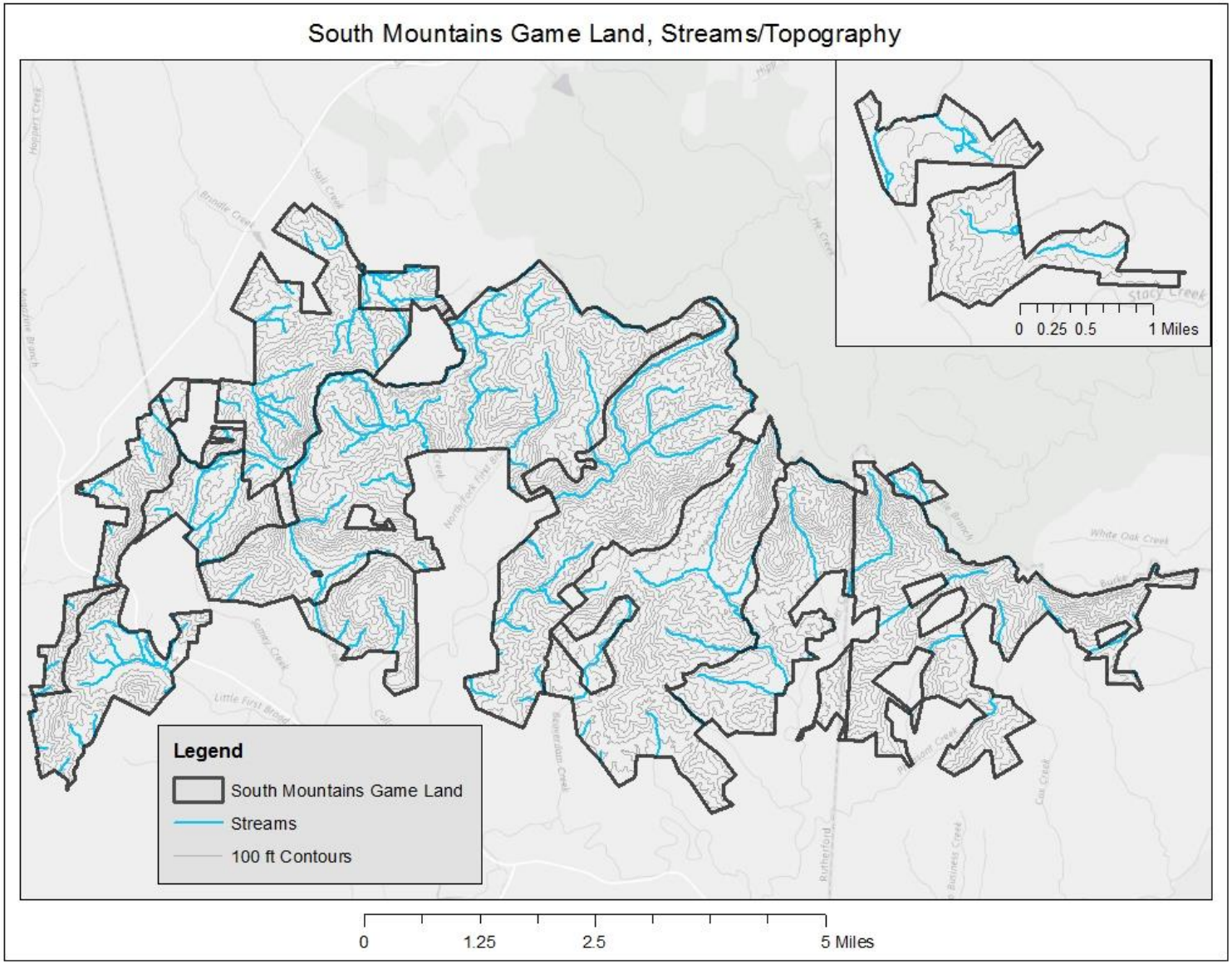
Map 3. Johns River Game Land, Natural Heritage Dedication (also see Appendix 3).



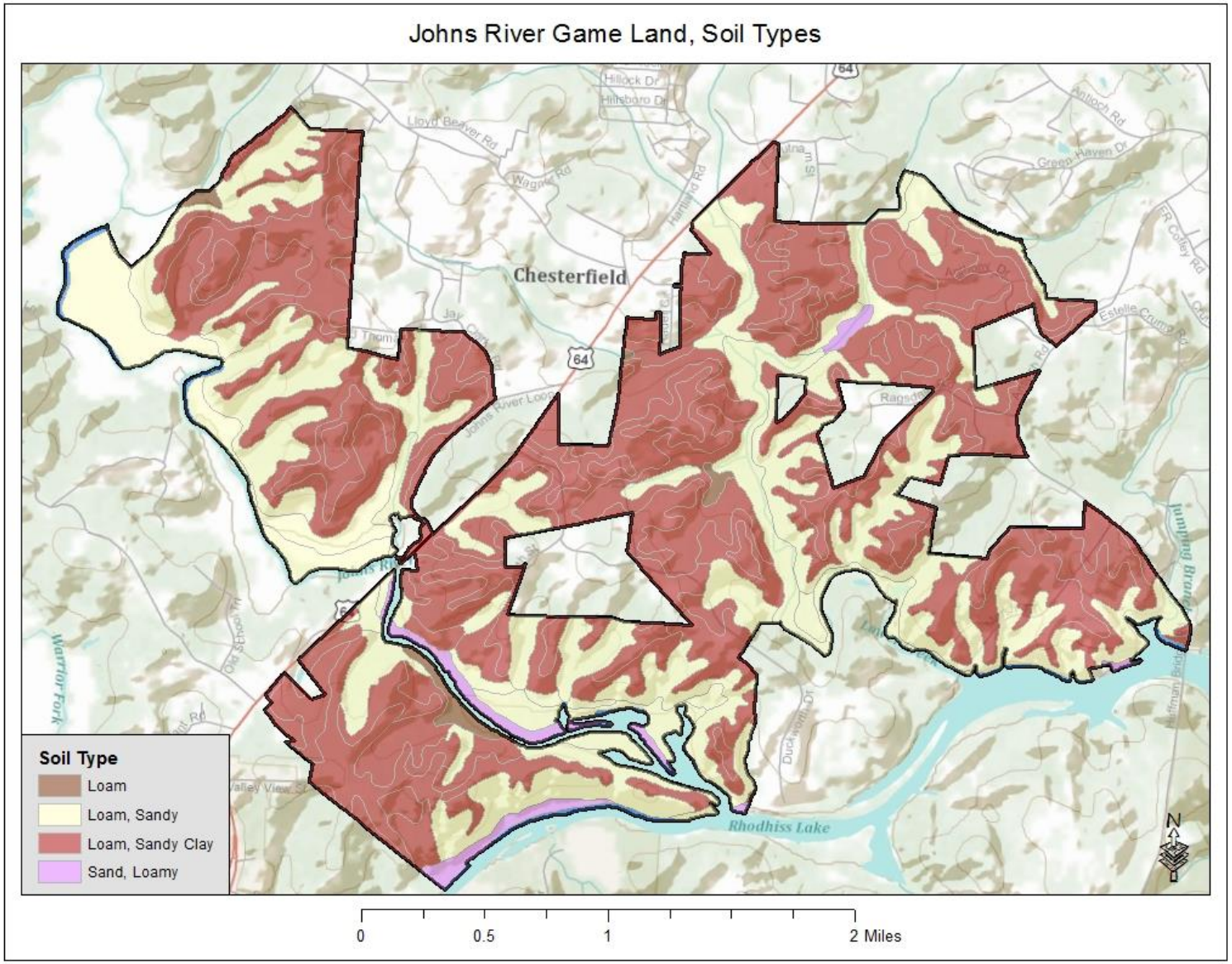
Map 4. South Mountains Game Land, Natural Heritage Dedication (also see Appendix 3).



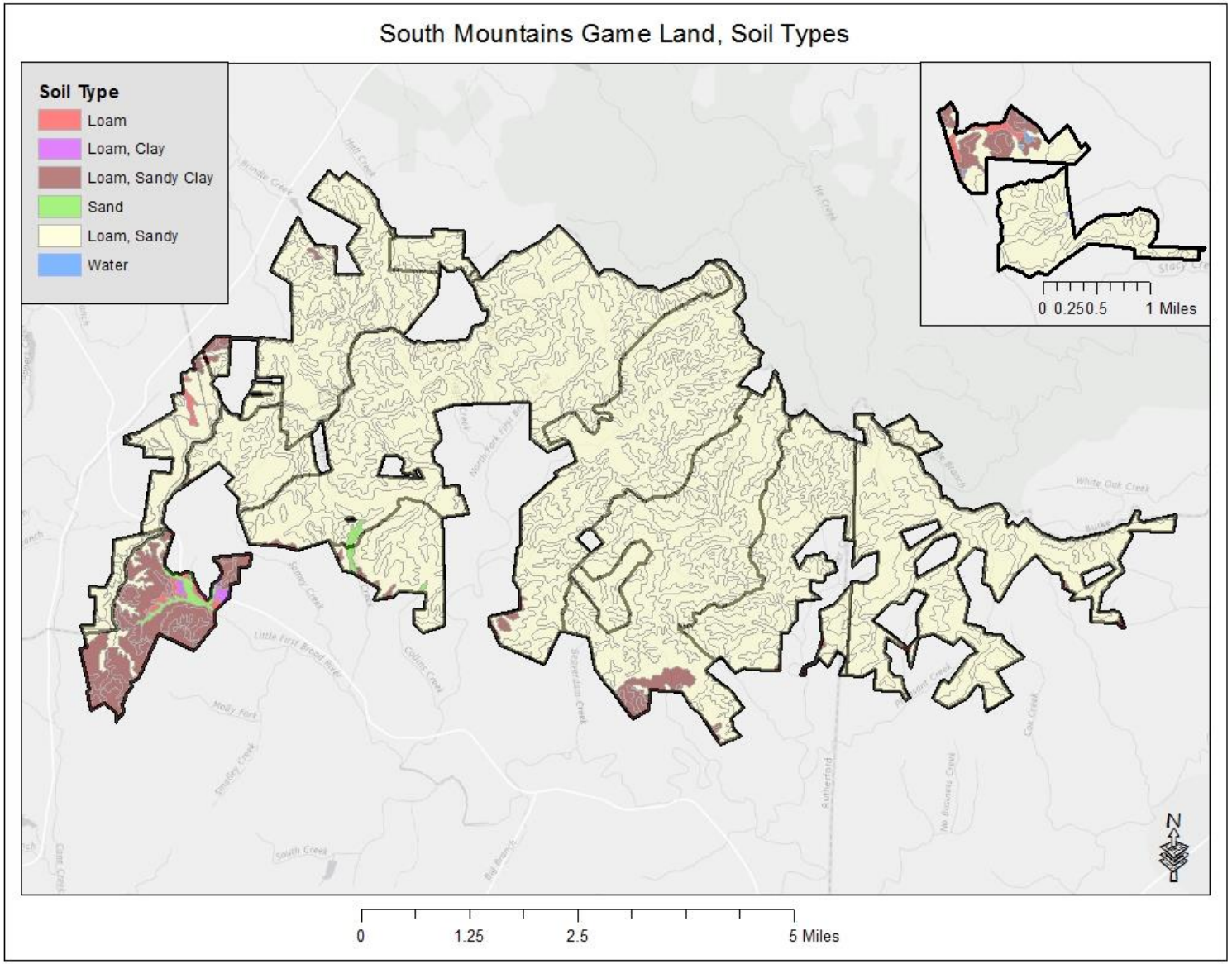
Map 5. Johns River Game Land, Topography and Streams.



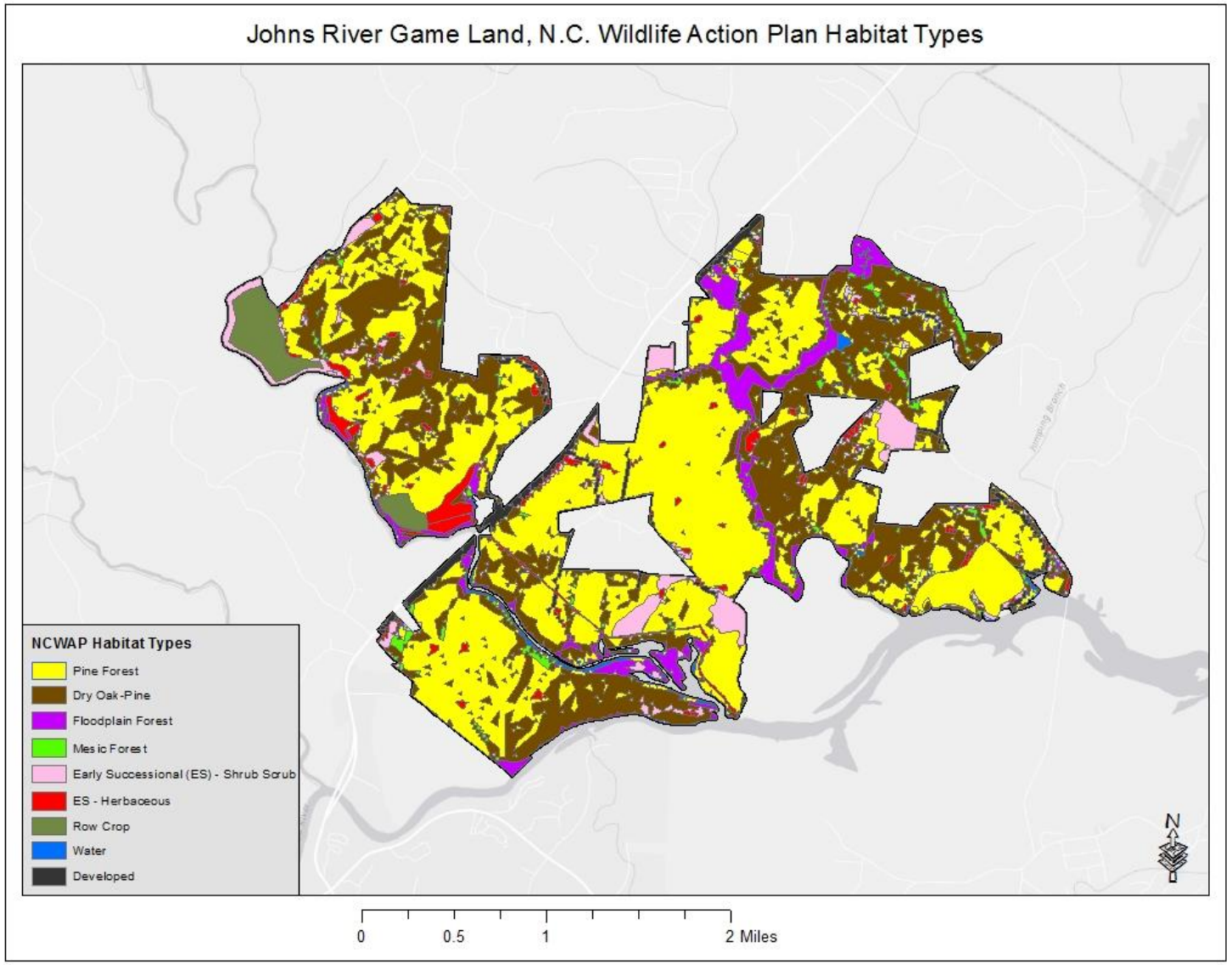
Map 6. South Mountains Game Land, Topography and Streams.



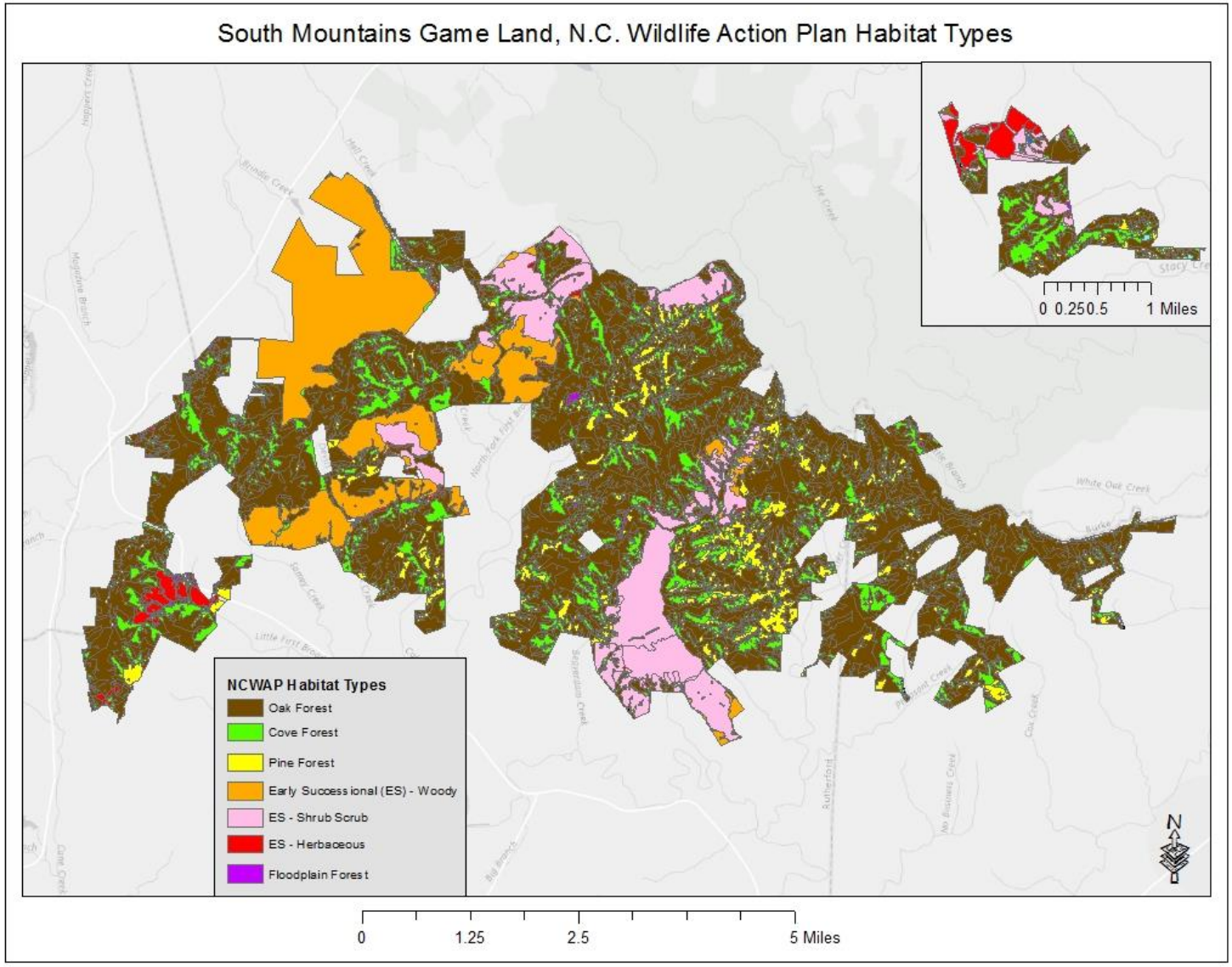
Map 7. Johns River Game Land, Soil Types (Soil Survey Staff 2014).



Map 8. South Mountains Game Land, Soil Types (Soil Survey Staff, 2014)

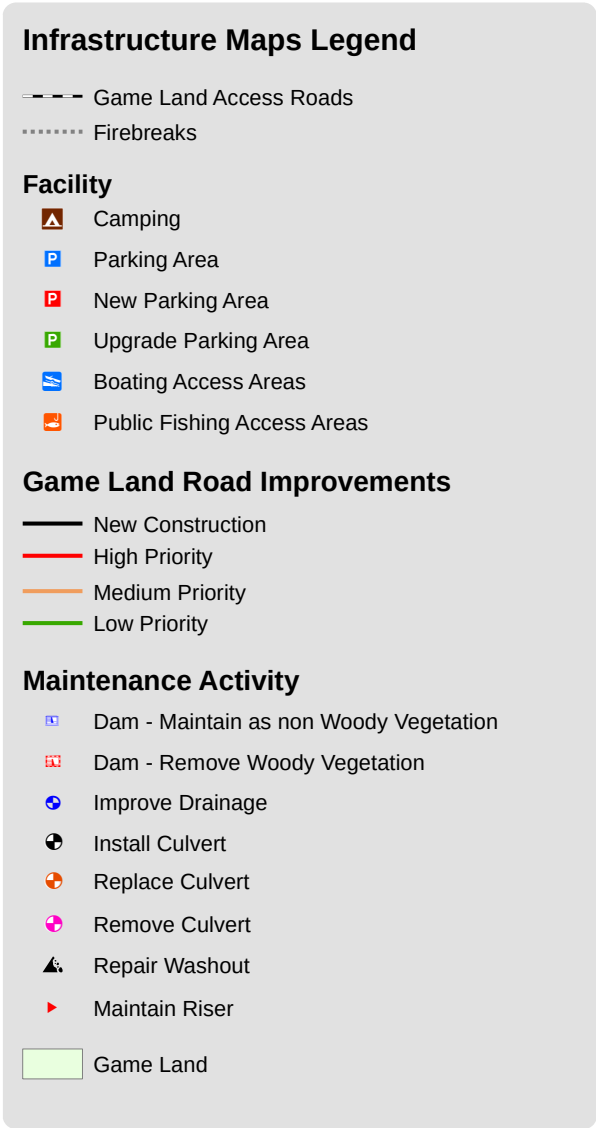


Map 9. Johns River Game Land, N.C. Wildlife Action Plan Habitat Types (N.C. State University 2008) (N.C. Wildlife Resources Commission 2005).

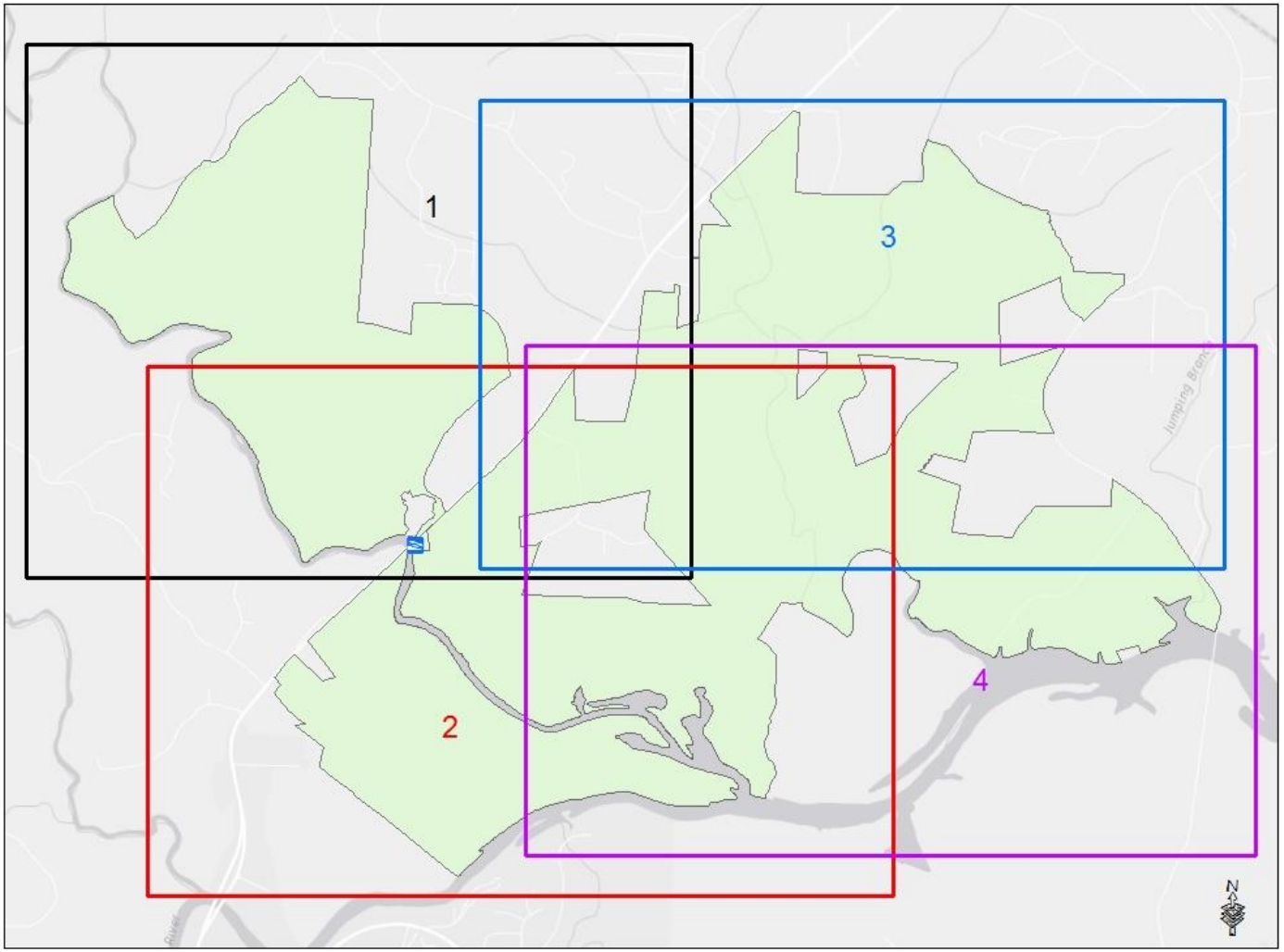


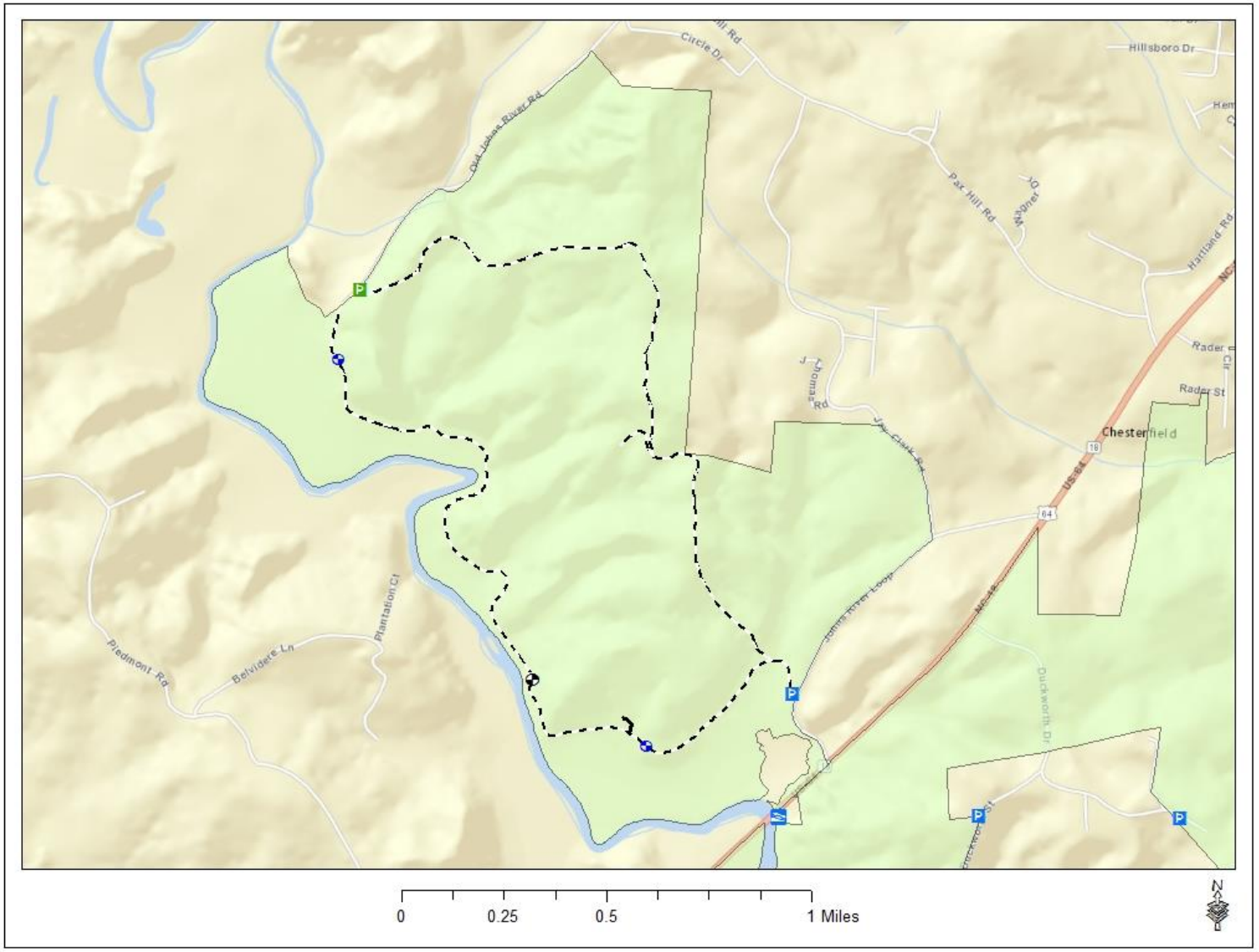
Map 10. South Mountains Game Land, N.C. Wildlife Action Plan Habitat Types (N.C. State University 2008) (N.C. Wildlife Resources Commission 2005).

INFRASTRUCTURE MAPS – LEGEND



Infrastructure Maps Key, Johns River Game Land.





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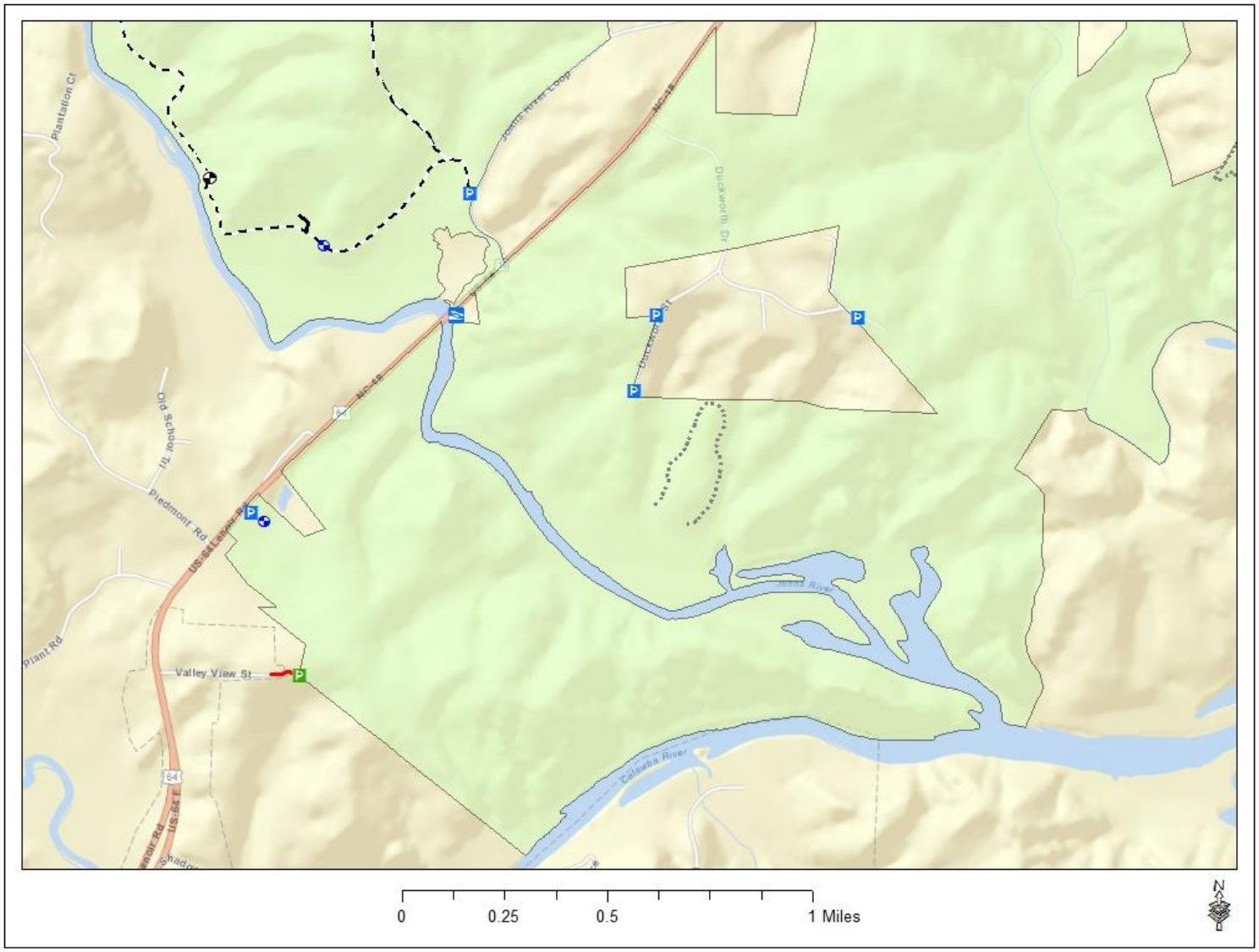

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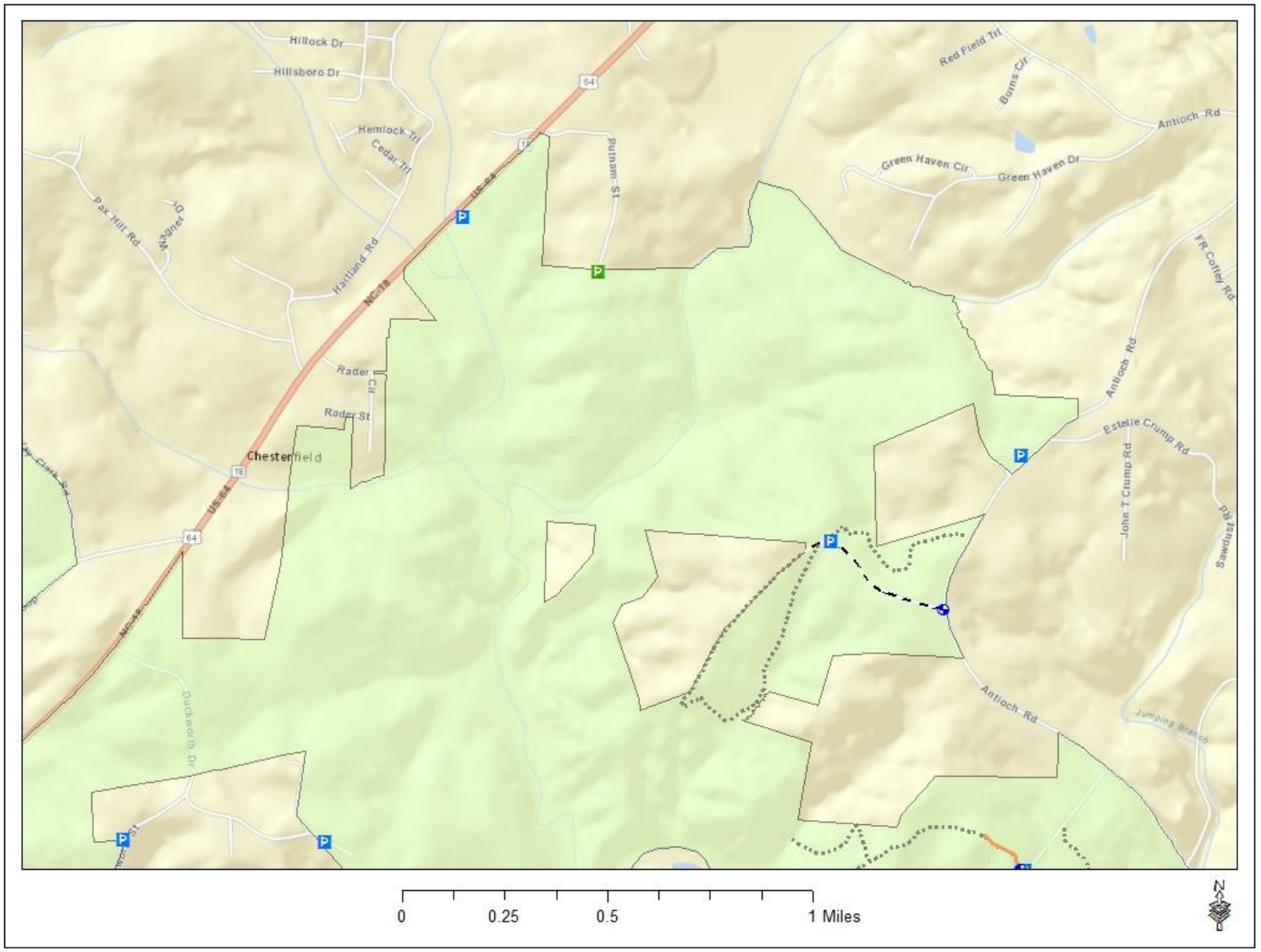

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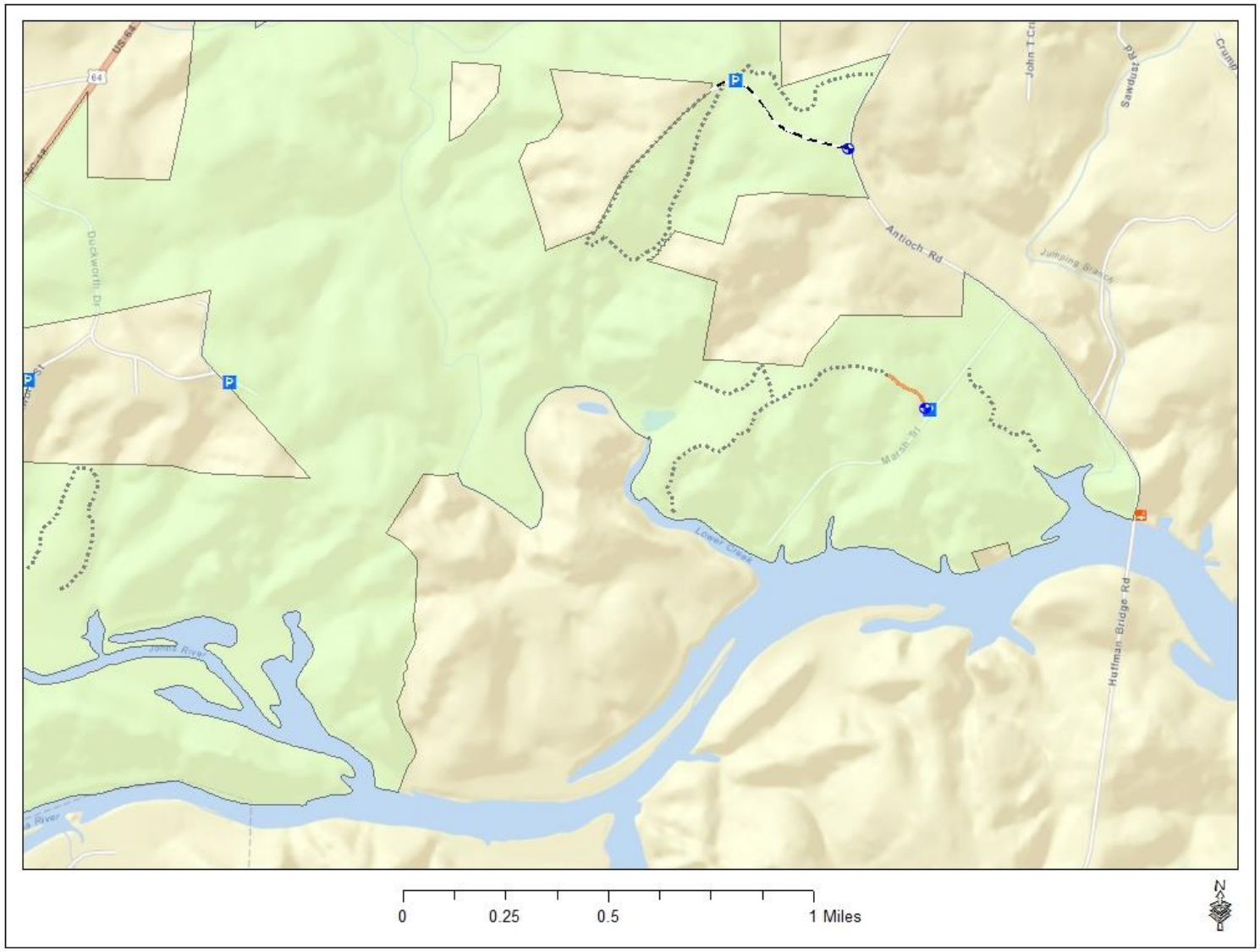
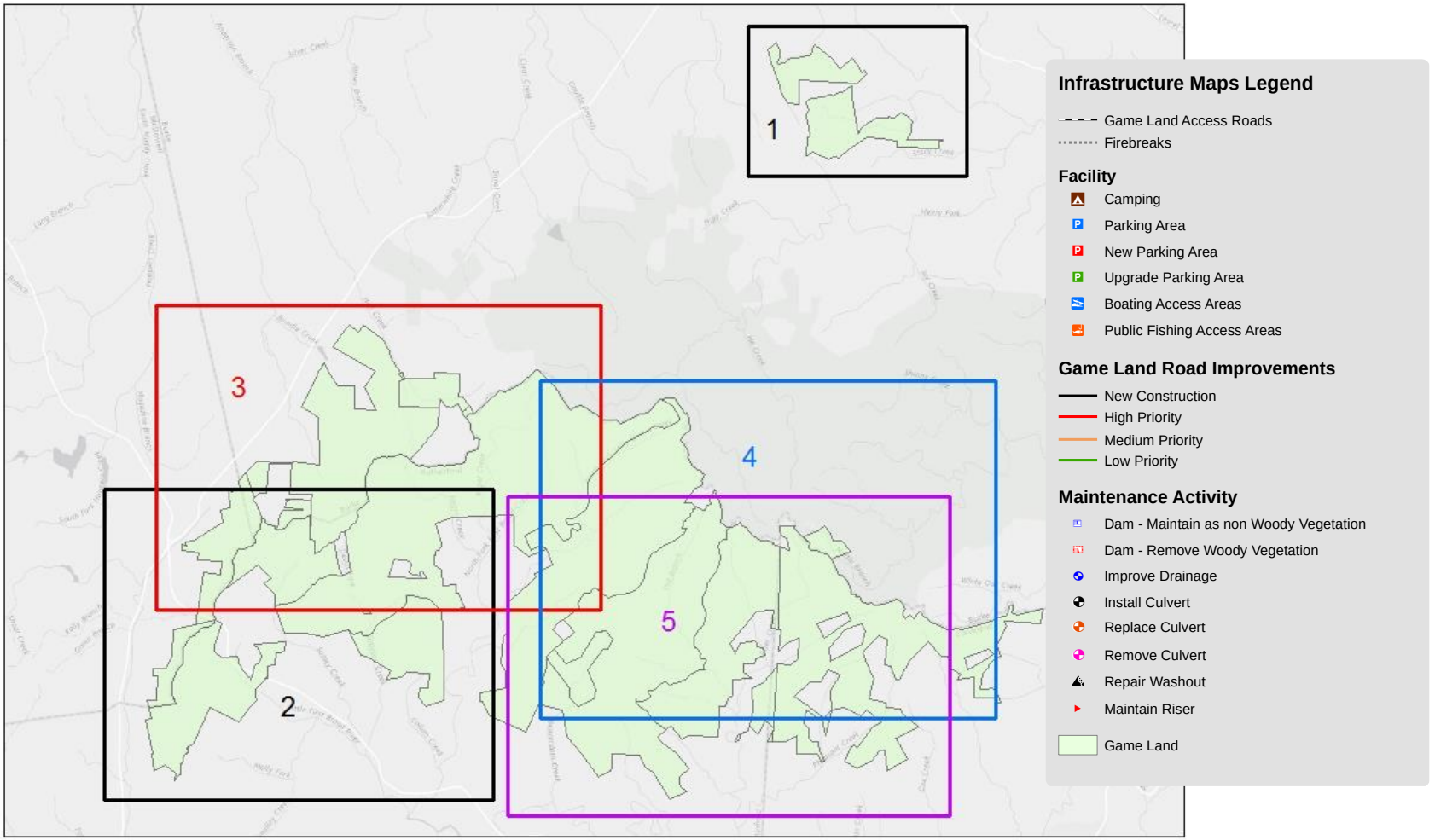
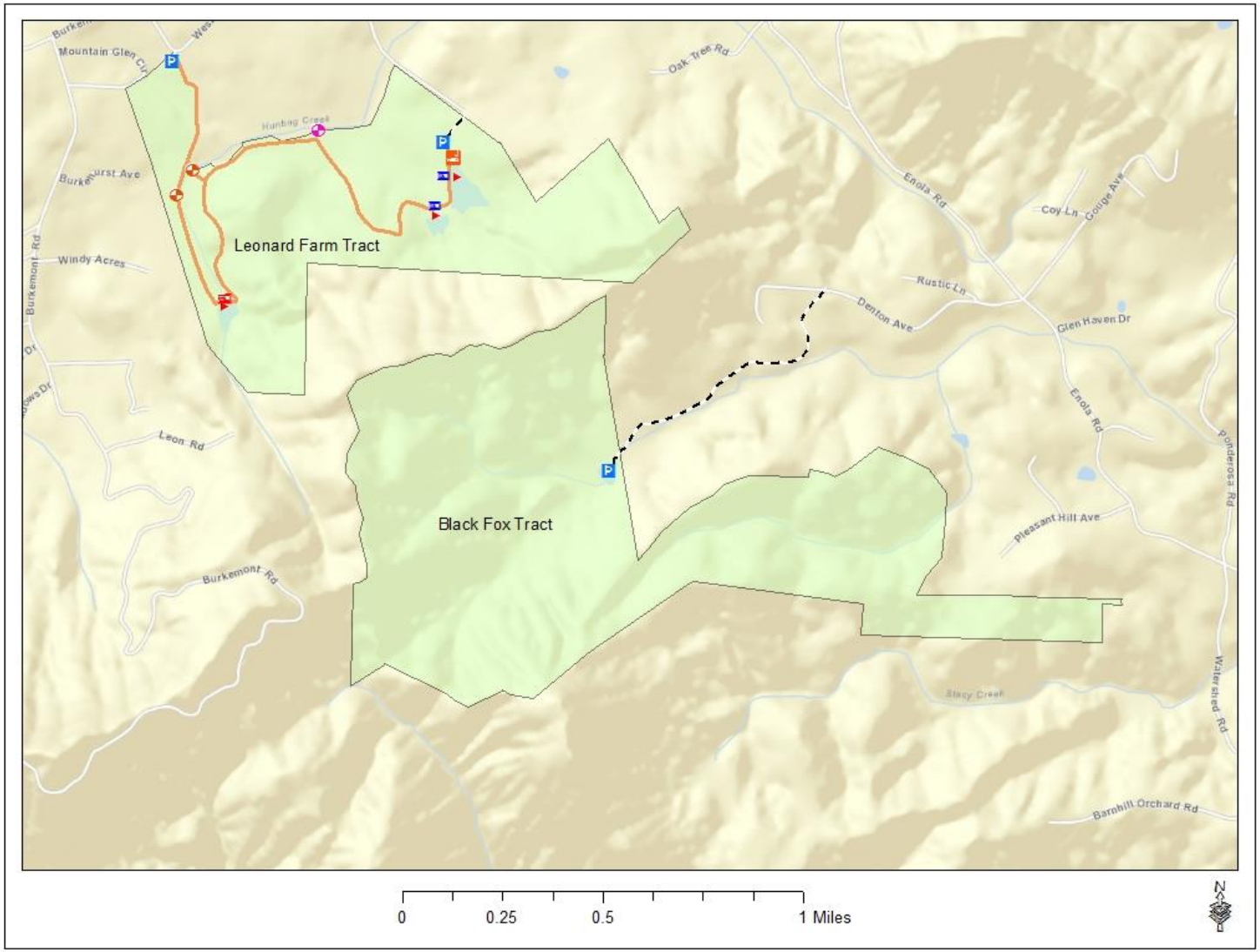


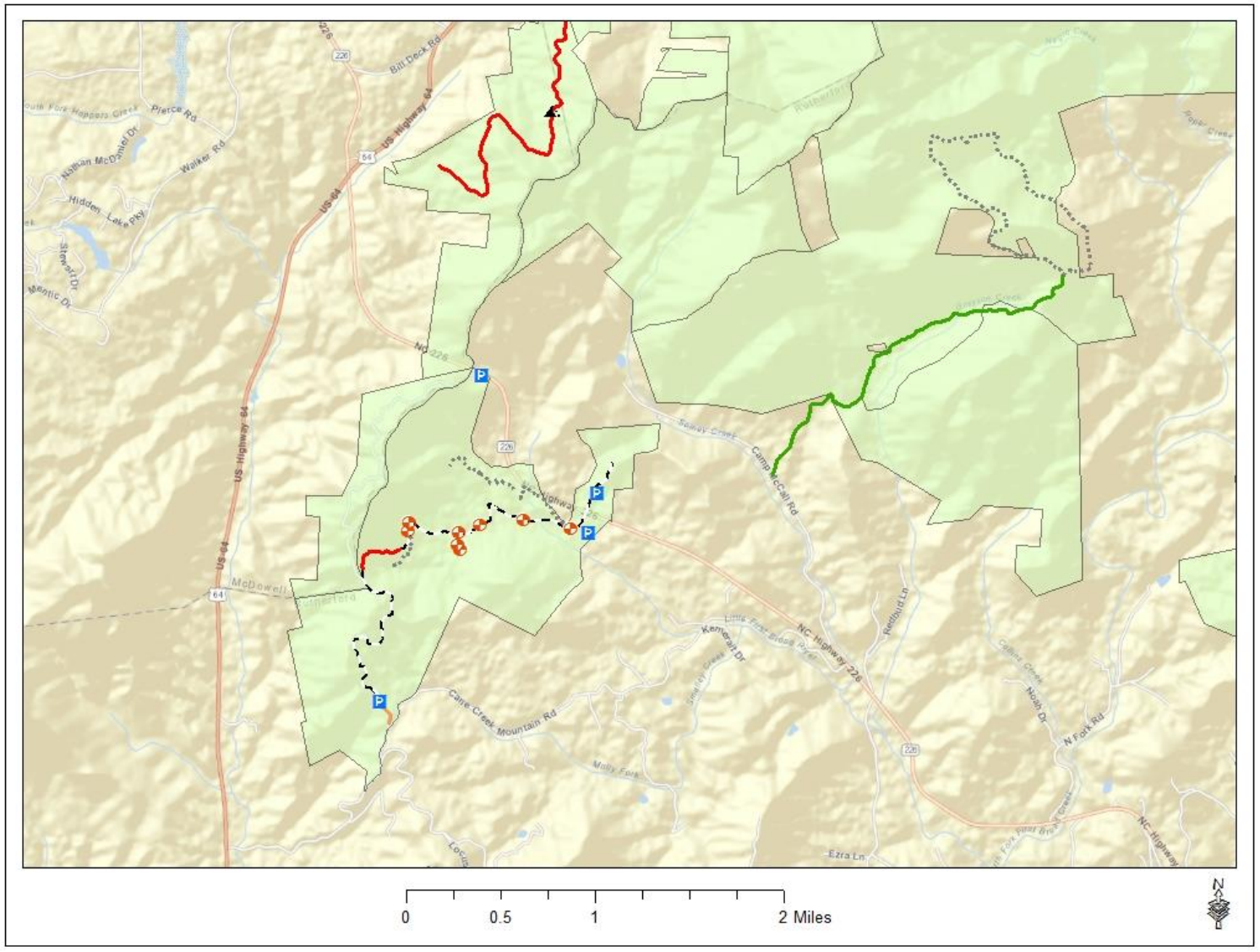
Infrastructure Map 4, Johns River Game Land.

Infrastructure Maps Key, South Mountains Game Land.





Infrastructure Map 1, South Mountains Game Land.



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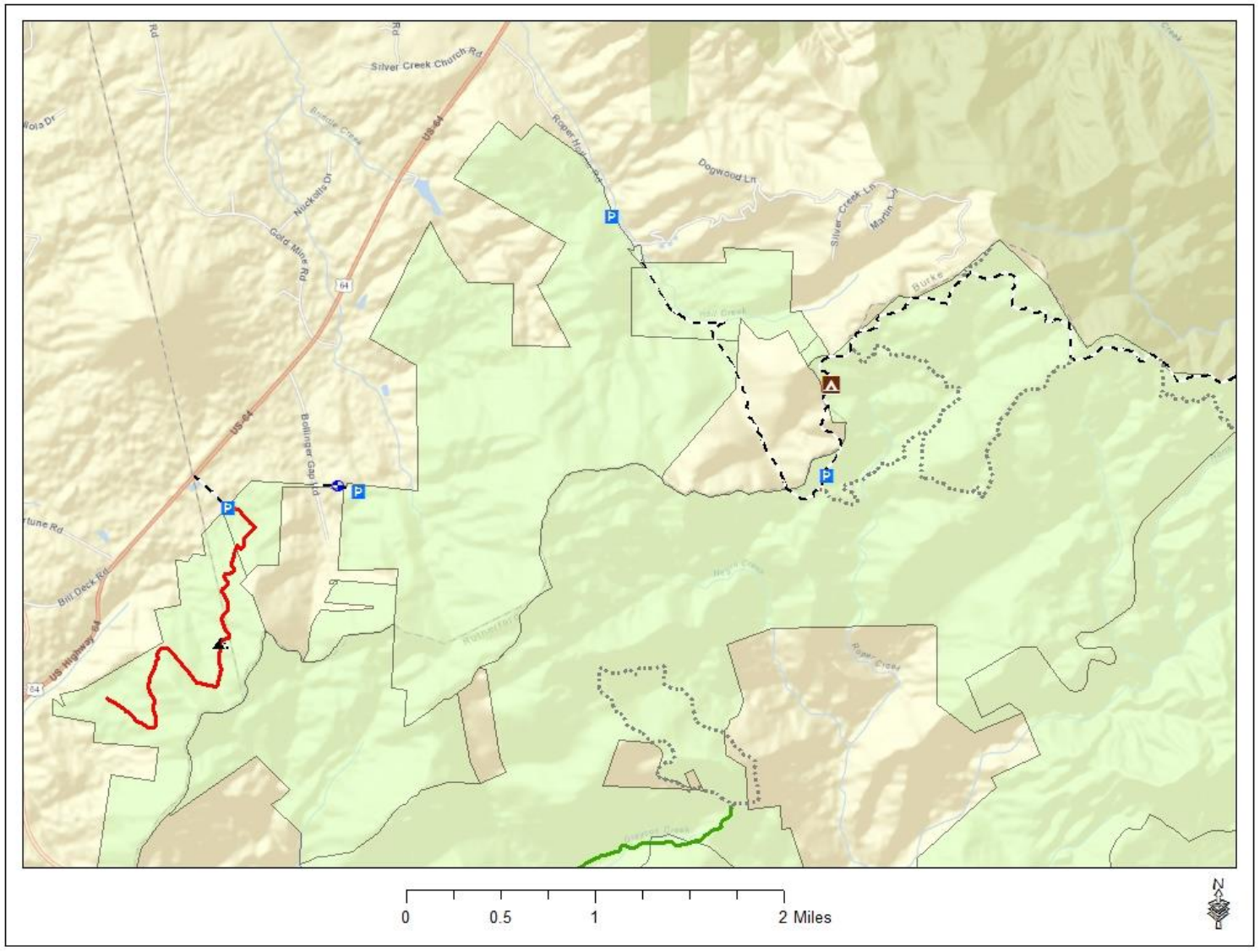
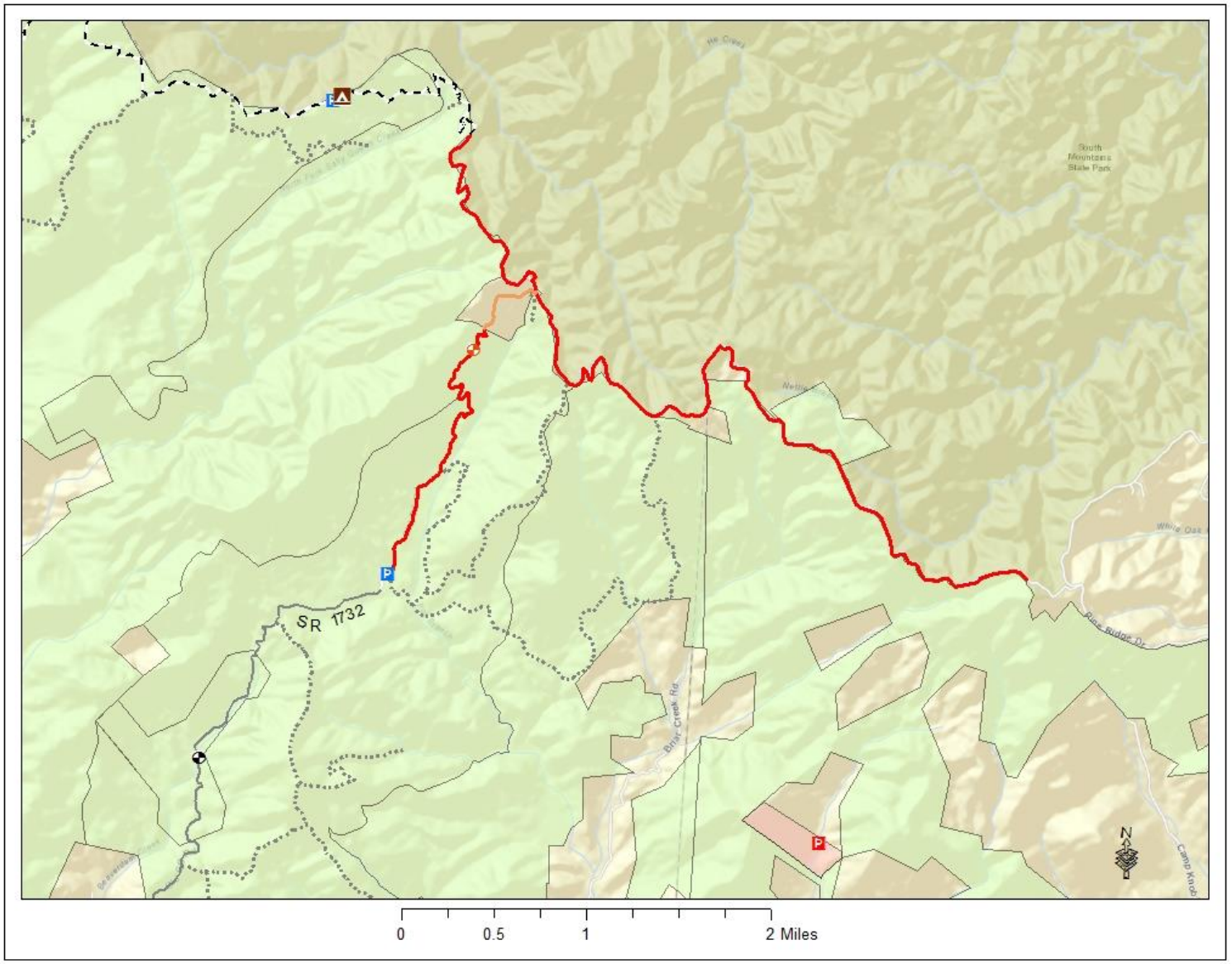
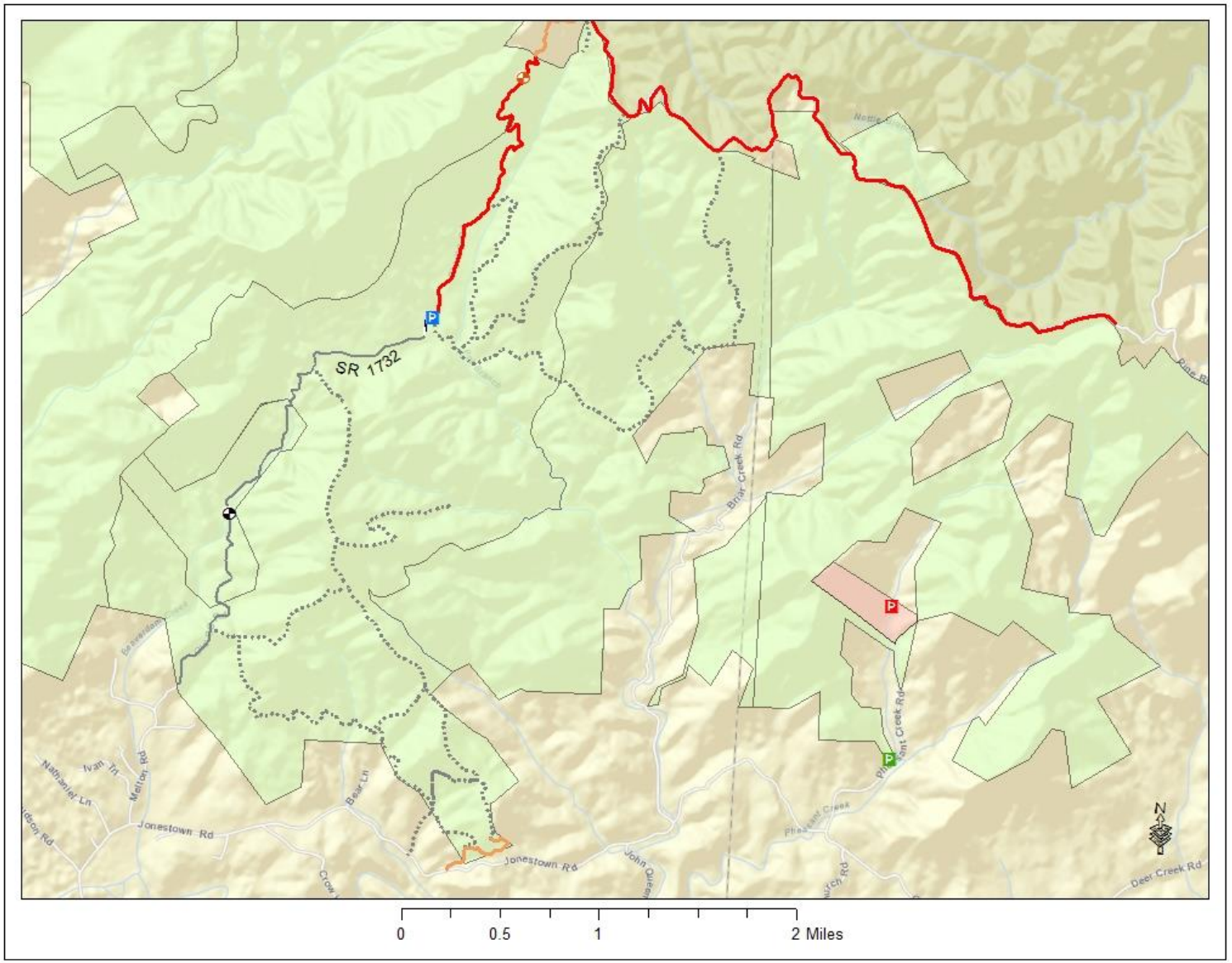


Infrastructure Map 3, South Mountains Game Land.



Infrastructure Map 4, South Mountains Game Land.



Infrastructure Map 5, South Mountains Game Land.

APPENDIX 2 –SOUTH MOUNTAINS GAME LAND CURE PLAN

South Mountain Game Land

CURE Plan

(Cooperative Upland Habitat Restoration and Enhancement)

31 March, 2004

Introduction

The South Mountains Game Land has been selected as the game land in the Western Region providing the greatest opportunity to demonstrate management of early successional habitat for the benefit of many small game and nongame species as part of the Cooperative Upland habitat Restoration and Enhancement (CURE) Program. This site will be a focal point and showcase for small game habitat in the western piedmont of North Carolina. Because of the elevation extremes, we are in the unique position of being able to manage for both Northern bobwhite and grouse on the same tract. We also have a great window of opportunity to establish brush and field habitats at little cost to the Commission because private loggers clear-cut 2,426 acres from 1997 through 2002.

The South Mountains Game Land contains 20,665 acres situated in Rutherford, Cleveland, Burke and McDowell Counties (Map 1). Of this, 18,626 acres are owned by the State (WRC) and the remainder is leased from Heartwood Forestland Fund III. We will establish and manage a CURE area in the state-owned portion within Rutherford County to enhance small game populations by favoring early successional stages of habitat.

Our plan outlines proposed management activities for the next 10 years. We will establish two CURE management units: a **Northern bobwhite CURE management area (QCMA)** and a **grouse CURE management area (GCMA**). Essentially, areas below 2000' elevation will be managed for Northern bobwhite and those over 2000' for grouse. The proposed QCMA is just over 3,000 acres. Of this, we plan to prescribe burn 1,558 acres, clear-cut 215 acres, thin 116 acres, aerially spray 226 acres, and develop 53.4 acres of fields. Hence **we will actively manage 2,168.4 acres or approximately 72% of the QCMA**.

The GCMA consists of roughly 4,700 acres. Of this total, 1,966 acres has just been clear-cut and hence will just start to become good grouse habitat by the end of this planning period. We will burn 921 acres and develop 19 acres of openings in this area also. The total **grouse habitat produced will be about 2,906 acres or about 62% of the GCMA**.

Objectives

1. Measurably increase populations of small game and associated early successional wildlife species through appropriate habitat manipulation.

2. Provide small game hunting opportunities for sportsmen.

Goals

The goals of our CURE management plan for the South Mountains Game Land are:

1. To intensively manage forested habitat and openings to benefit bobwhite Northern bobwhite, songbirds and other species of flora and fauna that are dependent on early successional habitats within both the Northern bobwhite and grouse management areas.
    a) To maintain at least 60 percent of both Northern bobwhite and grouse management areas in early successional wildlife habitat (this total will include all wildlife fields, seeded roads, prescribed burned areas, and forest stands that are 10 years or less in age).
    b) To develop 1% of the total game land in permanently open condition (fields) consisting of native and agricultural plant species.
2. To emphasize connectivity of early successional wildlife habitats and/or provide early successional areas located in as close proximity to each other as possible.
3. To conduct periodic surveys of wildlife and vegetation to measure changes in populations of small game and other associated wildlife species.
4. To improve and develop access for hunters and wildlife management personnel through reconstruction and construction of roads and parking areas and through additional land acquisitions and right-of-way purchases.

CURE Area Description

At present, the majority of the QCMA is composed of hardwood/pine (40.6%), hardwood (23.9%) and pine (18.9%) forest types (Table 1). Forest openings constitute just over 15% of the area. Predominant hardwood species include oaks (scarlet, red, white, chestnut), hickories, red maple, and yellow poplar. Pine forest types are mainly white pine, pitch pine, Virginia pine and occasional shortleaf pine. Most of the forested hardwood and pine stands are approximately 50-60 years old. The present habitat composition of the GCMA at present is divided between hardwood/pine forests (47.0%) and openings (41.4%, Table 1).

Management Activities

We will accomplish the goals of our CURE management plan for the South Mountains Game Land by creating early successional habitats that benefit both Northern bobwhite and grouse. As noted, 2,426 acres is already in a favorable condition for small game. Beyond this, our focus will be on the 2 major sections of the game land: the QCMA and the GCMA. We will create and maintain early successional habitats by developing 72.4 acres of fields, burning nearly 2,500 acres, clear-cutting and thinning timber on 331 acres, aerially spraying 226 acres, and managing access on 54 roads which includes developing linear wildlife openings along 12 existing roads. Our plans for the next 10 years for each of these activities are described below.

Our activities will result in significant changes to the 2 CURE areas selected (Table 2). In addition to maintaining or enhancing the 31.3% of the area already in early successional habitat, we anticipate that over 54% of the CURE areas will be converted and maintained in a condition favorable for small game species and wildlife dependant on early successional habitat. Specifically, we will actively manage over 72% of the QCMA and over 62% of the GCMA.

Field Management

We plan to create and to maintain 72.4 acres of wildlife openings to benefit small game species (Tables 3a, b; Map 2). Along with planned linear wildlife openings, we will meet our goal of 1% permanent openings. We will establish and maintain 50.6 acres of fallow fields, 16.2 acres of cool season legumes, and 5.6 acres of native warm season grasses over the next 10 years on the South Mountains Game Land CURE areas (see Table 3a for schedule of field establishment). A total of 53.4 acres of fields are in the QCMA and 16.2 acres in the GCMA (*see* Table 3b and corresponding Maps 3-6 for locations of fields within these areas). We will manage small game openings as follows:

- ***Fallow fields***. After fields are cleared, soil samples will be taken from 5 locations in each opening and tested to determine the amount of fertilizer and lime to be used for the desired crop. Fallow fields will be managed according to fallow field management guidelines described by Mueller (The Tall Timbers Report, QU Magazine) with some modification to each field. Essentially, a field is divided into 3 sections; one is planted to small grains, one is fallow for one year and the remaining section is fallow for 2 years; the sections are rotated annually. A harrow strip is made through the field each year (in different locations) and brushy areas (3 years old) are maintained in two corners. Modifications will be in the form of additional strips of warm season grasses (Big Blue Stem, Little Blue Stem, Indian Grass, Switch Grass, and Eastern Gamma Grass). There may also be a strip of Ladino Clover and Winter Rye in selected fields. These modifications will allow us to incorporate a diversity of food and cover into the area.

- ***NWSG fields***. After fields are cleared, soil samples will be taken from 5 locations in each opening and tested to determine the amount of fertilizer and lime to be used for the desired vegetation. We will then prepare the site which includes use of herbicides to control competing vegetation and use a drill to plant desired grasses (Big Blue Stem, Little Blue Stem, and Indian Grass). A border of a cool season grass (ex. orchard grass) will be planted around each field to act as a fire lane. Fields will be burned on a 1-2 year rotation to maintain the NWSG component.
- ***Cool Season Legume Fields***. After fields are cleared, soil samples will be taken from 5 locations in each opening and tested to determine the amount of fertilizer and lime to be used for the desired crop. We will then prepare the site and use a drill or cultipacker to plant the desired legume. Fields will be mowed on a 1 year rotation to maintain the legume component.
- ***Linear wildlife openings.*** We have identified 12 old road beds to be seeded and maintained as linear openings for small game and associated early successional wildlife species over the next 10 years.

Prescribed Burning.

We will use prescribed burning as a major tool to meet our early successional goals. Initially we will burn in the understory of forested and clear-cut units to establish savanna-like conditions. We are planning 1,558 acres of burning in the QCMA and 921 acres of burns in the GCMA (Table 4, Maps 7, 8, and 9). Later, but before units that are clear-cut as part of this management plan become 10 years old, we will begin burning them to restore early successional characteristics. Stand replacement burns in primary natural areas will help link important early successional habitat.

- ***Understory burning***. We identified several large areas for prescribed burning in the understory to create habitat conditions favorable for small game and associated early successional wildlife species. Prescribed burning units will generally receive dormant season (winter) under-story burning on a 3 to 4 year cycle and this may require the use of helicopter burning. Eventually, as repeated burning creates a more open woodland meadow/forest savanna habitat condition within the units, growing season and more frequent burning will be implemented. Perennial streams, creeks, and rivers, as well as existing roads and trails, will be utilized for firebreaks as much as possible. While some firebreak construction will be required initially in each unit, later burns will be more easily facilitated since firebreaks will already be in place. Additionally, these firebreaks will also provide access and seeded linear openings for small game and associated early successional wildlife species.
- ***Regenerating area burning***. Beginning in 2003, we will begin burning portions of areas that have been clear-cut during 1997-2002 to maintain age classes below 10 years old. The goal in these areas is to control woody vegetation and to maintain grasses, forbs, blackberries, and other vegetation beneficial to Northern bobwhite and other early successional wildlife species. Regeneration of trees is not an objective on these sites.
- ***Stand replacement burns***. We plan to explore the use of fire in Natural Heritage primary areas especially on south and southwest facing aspects where pitch pine and table mountain pine occur. Managing for this now uncommon forest type will be consistent with developing understory conditions that will favor the movement of bobwhite Northern bobwhite from one area to another. Hence, burning these areas will help us meet our goal of connecting early successional habitats. Approximately 820 acres of our planned burning occurs in these stands.

Timber Management.

A large timber sale was executed in 1997 just prior to acquisition of the Rollins Tract (the major portion of South Mountains Game Land). All clear-cutting for this timber sale was completed in 2002. This provided approximately 2,426 acres (over 13 percent) of the game land in early successional forest habitat available for small game and associated early successional wildlife species. In total, of the areas clear-cut during this timber sale, 272 acres will be burned in the Northern bobwhite CURE management area and 680 acres will be burned in the grouse CURE management area. Additionally, 226 acres of these clear-cuts will be aerially sprayed in the QCMA (see Map 10). This includes an overlap of approximately 78 acres of clear-cuts to be

burned. Given this level of timber harvest, our plans for the next 10 years do not involve much additional cutting, but rather trying to maintain stands in early successional conditions as noted above. A comprehensive forest inventory and stand mapping of the game land is needed and will be conducted during the last several years of this planning period.

- ***Timber harvest.*** We plan to clear-cut and thin timber on an additional 331 acres in the Northern bobwhite CURE management area during 2005-2007 (Table 5, Map 10). For this cycle, all forestry operations will occur in the QCMA as grouse habitat already created will not be in peak condition until after the 10 year planning period (1,966 acres).

- ***Herbicide Treatments*.** The use of herbicides to create and maintain early successional habitat conditions will be a vital part of management efforts on the CURE areas. This will include treating edges to reduce encroachment of woody vegetation into fields and linear openings as well as occasionally treating the openings to eradicate undesirable plant species. Spraying of herbicides will also be used to set back woody succession in clear-cut areas and will be especially valuable in those areas where prescribed burning is not possible due to terrain and/or other factors. During this initial 10 year planning period, 226 acres of the areas clear-cut from 1997 through 2002 will be aerially sprayed (see map 10 for location of aerial spraying).

Summary of Planned Habitat Management Activities

A summary of all planned habitat management activities is found in Table 6. Map 11 provides a summary of the locations for these actions.

Monitoring

Monitoring the response of both wildlife and vegetation to our actions is an important part of our management plan. We will determine the impacts of our management on small game, songbirds, selected nongame species and vegetation.

Vegetation.

We will monitor vegetation in areas burned by setting up photo points, 1/10 acre surveys, and meter square surveys. Number of sites will be determined based on the size of the treatment units. Surveys will be conducted annually. We will also maintain a GIS database of all habitat alterations, updating the coverages annually. These updates will be used to track habitat changes also.

Fauna.

We will monitor the following wildlife species in treatment areas and in control areas:

a) Bobwhite Northern bobwhite. Conduct spring Northern bobwhite call counts and fall covey counts following protocol developed by our Division.

b) Grouse. Conduct spring drumming counts in late March across suitable grouse habitat.

c) Rabbits. Conduct rabbit flush counts or similar trend indicator technique.

d) Songbirds. Conduct breeding bird counts along representative roads during mid-May to late June using 5 minute listening stations. Set up mist netting stations at appropriate sites to document usage of specific habitat components by birds.

e) Nongame. Work with nongame staff to contract inventories of specific nongame species such as amphibians or small mammals. These will not be monitoring per se but will provide baseline data on presence of selected nongame species.

We will set up points and lines to be representative of the area and the treatments we make to the land. We will consult with appropriate personnel to set up reliable monitoring systems and we plan to work cooperatively with sportsmen groups, college and university staff, and local groups to monitor both flora and fauna on this area. In addition, we will compare surveys done on South Mountains Game Land with those conducted in the adjacent South Mountains State Park in order to discern effects of our management on species number and abundance.

Budget Schedules

Estimated expenditures for completing management operations are found in Table 7. All planned expenditures for 2001-2004 have been made, although aerial spraying and the purchase of a dozer are in progress currently.

Summary

We plan to manage 2 areas of the South Mountains Game Land for small game; a 3,000 acre Northern bobwhite CURE management area and a 4,700 acre grouse CURE management area. Within these areas, we will manage intensively to establish and to maintain early successional habitats needed by small game and other associated nongame species. We plan to burn 2,479 acres, clear-cut and thin timber on 331 acres, aerially spray herbicides on 226 acres, and develop 72.4 acres of wildlife fields over the next 10 years.

List of tables

List of Maps

Table 1. Habitat composition of CURE management areas on South Mountains Game Land. Habitat type and acreage determined from 2003 aerial images and ground-truthing. (note: 23 acres of CURE fields & seeded roads had been developed when aerial photography became available in 2003).

Habitat Type		Northern bobwhite CURE Management Area	Grouse CURE Management Area	Total
Fields & Seeded Roads	**acres**	13	10	23
	%	0.4	0.2	
Hardwood	**acres**	724	139	863
	%	23.9	2.9	
Hardwood/ Pine	**acres**	1227	2225	3452
	%	40.6	47.0	
Pine	**acres**	573	392	965
	%	18.9	8.3	
Pine Plantation	**acres**	17	0	17
	%	0.6	0.0	
Forest Openings	**acres**	460	1943	2403
	%	15.2	41.1	
Other	**acres**	10	23	33
	%	0.3	0.5	
Total	**acres**	3024	4732	7756
	%	100.0	100.0	

Table 2. South Mountains Game Land CURE area habitat composition and percentage of area in early successional habitats (% ES) before CURE management changes, and anticipated habitat composition after CURE management changes are implemented (approximately 10 years).

	Before CURE				After CURE		
Habitat Type	**Acres**	**%**	**% ES***	**Anticipated Change**	**Acres**	**%**	**% ES***
Fields/ seeded rds	0	0.0	0.0	-1% (72.4 acres) of CURE areas in grass/forb.	72.4	0.9	0.9
Hardwood	863	11.1	0.0	-43% of harddwood converted to oak savannas. -7% of hardwood (60 acres) thinned. -9% of hardwood (77 acres) clear-cut.	414.0	5.3	0.0
Oak Savanna	0	0.0	0.0	-5% of CURE areas (372 acres) in savannas.	372.0	4.8	4.8
Pine/Oak Savanna	0	0.0	0.0	-9% of CURE areas (705 acres) in savannas.	705.0	9.1	9.1
Pine Savanna	0	0.0	0.0	-6% of CURE areas (450 acres) in savannas.	450.0	5.8	5.8
Hardwood/Pine	3452	44.5	0.0	-20% of hdwd.**/pine converted to savannas. -1% of hardwood/pine (23 acres) thinned. 2% (85 acres) clear-cut and not replanted. -1% of hdwd./pine converted to grass/forb.	2625.8	33.9	0.0
Pine	965	12.4	0.0	-47% of pine converted to pine savannas. -3% of pine (33 acres) thinned. -4% (36 acres) clear-cut and not replanted.	479.0	6.2	0
Pine Plantation (41 - 50 years)	17	0.2	0.0	-Entire 17 acres is clear-cut and not replanted. 100% converted to forest openings.	0.0	0.0	0.0
Forest Openings	2426	31.3	31.3	-7% increase in forest openings as a result of 215 acres of clear-cuts and conversion of 36.2 acres to fields and seeded roads.	2604.8	33.6	33.6
Other	33	0.4	0.0	No acreage change.	33.0	0.4	0.0
Total	7756	100.0	31.3		7756.0	100.0	54.2

* %ES = percent early succesional habitat / **hdwd. = hardwood

Table 3a. Proposed field development schedule on South Mountains CURE areas, 2003-2011.

FIELD TYPE	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	TOTAL
Fallow	0	0	10.7 *(1,3)*	17.5 *(1)*	3.8 *(3)*	18.6 *(3)*	0	**50.6**
NWSG	2.8 *(6)*	0	1.3 *(2)*	0	1.5 *(4)*	0	0	**5.6**
Cool Season - Legume	4.4 (5)	1.3 *(5)*	3.3 *(5)*	1.5 *(5)*	4.2 *(7)*	0	1.5 *(7)*	**16.2**
Total Acres	**7.2**	**1.3**	**15.1**	**19.0**	**9.4**	**18.6**	**1.7**	**72.4**

[a] *The number of acres to be developed each year is listed first; then the field reference number is shown in parenthesis. The field reference number corresponds to the reference number in table 3b and maps 3-6.*

Table 3b. Locations of proposed and existing fields on South Mountains CURE areas, 2003-2011. Reference number refers to maps 3 through 6 in the maps section of this document.

Ref. #	Location	Type planting	Acres
1	Golden Valley Clear-cut	Fallow	23.8
2	Golden Valley Clear-cut	NWSG	1.3
3	Pots Branch Clear-cut	Fallow	26.8
4	Pots Branch Clear-cut	NWSG	1.5
5	GCMA – East	Cool Season Legume	10.4
6	GCMA – East	NWSG	2.8
7	GCMA - West	Cool Season Legume	5.8
		TOTAL:	**72.4**

Table 4. Schedule of prescribed burns on South Mountains CURE areas, 2003-2011. . Please see Maps 7, 8, and 9 for locations of burns each year.

Year	Firebreak Construction	Area of Prescribed Burning
2001-2002	0 miles	0 acres
2002-2003	5.0 miles	188 acres
2003-2004	4.25 miles	350 acres (Northern bobwhite)
2004-2005	6.0 miles	200 acres (Northern bobwhite), 176 acres (grouse)
2005-2006	4.5 miles	300 acres (Northern bobwhite), 106 acres (Northern bobwhite: re-burn), 389 acres (grouse)
2006-2007	0.75 miles	432 acres (Northern bobwhite: re-burn), 143 acres (grouse)
2007-2008	2.25 miles	520 acres (Northern bobwhite), 200 acres (Northern bobwhite: re-burn), 213 acres (grouse)
2008-2009	0 miles	406 acres (Northern bobwhite: re-burn), 176 acres (grouse: re-burn)
2009-2010	0 miles	432 acres (Northern bobwhite: re-burn), 389 acres (grouse: re-burn)
2010-2011	0 miles	720 acres (Northern bobwhite: re-burn), 143 acres (grouse: re-burn)
	Total:	**2,479 acres**

Table 5. Timber management activities on South Mountains CURE areas, 2003-2011. Please see Map 10 for locations of timber management activities each year.

Year	Forest Inventory & Mapping	Timber Sales: acres and volumes	Reforestation: method and acres
2004-2005	-	Clear-cut 90 acres, Thin 33 acres (500 MBF; 1,000 cords) Aerial spray 226 acres.	-
2005-2006	-	-	Site Prep. (residual felling) 73 acres, Pre-commercially Thin 83 acres
2006-2007	-	Clear-cut 125 acres (400 MBF; 1,400 cords)	
2007-2008	-	-	Site Prep. (residual felling) 125 acres
2008-2009	Approx. 6,000 acres	-	-
2009-2010	Approx. 6,000 acres	-	-
2010-2011	Approx. 6,000 acres	- -	-
Total:	**Approximately 18,000 acres**	**215 acres clear-cut 33 acres thinned 226 acres sprayed**	**198 ac. site prep. 83 acres thinned**

Table 6. Summary of all management activities on South Mountains CURE areas, 2003-2011. Please see Map 11 for a summary of locations for all management activities.

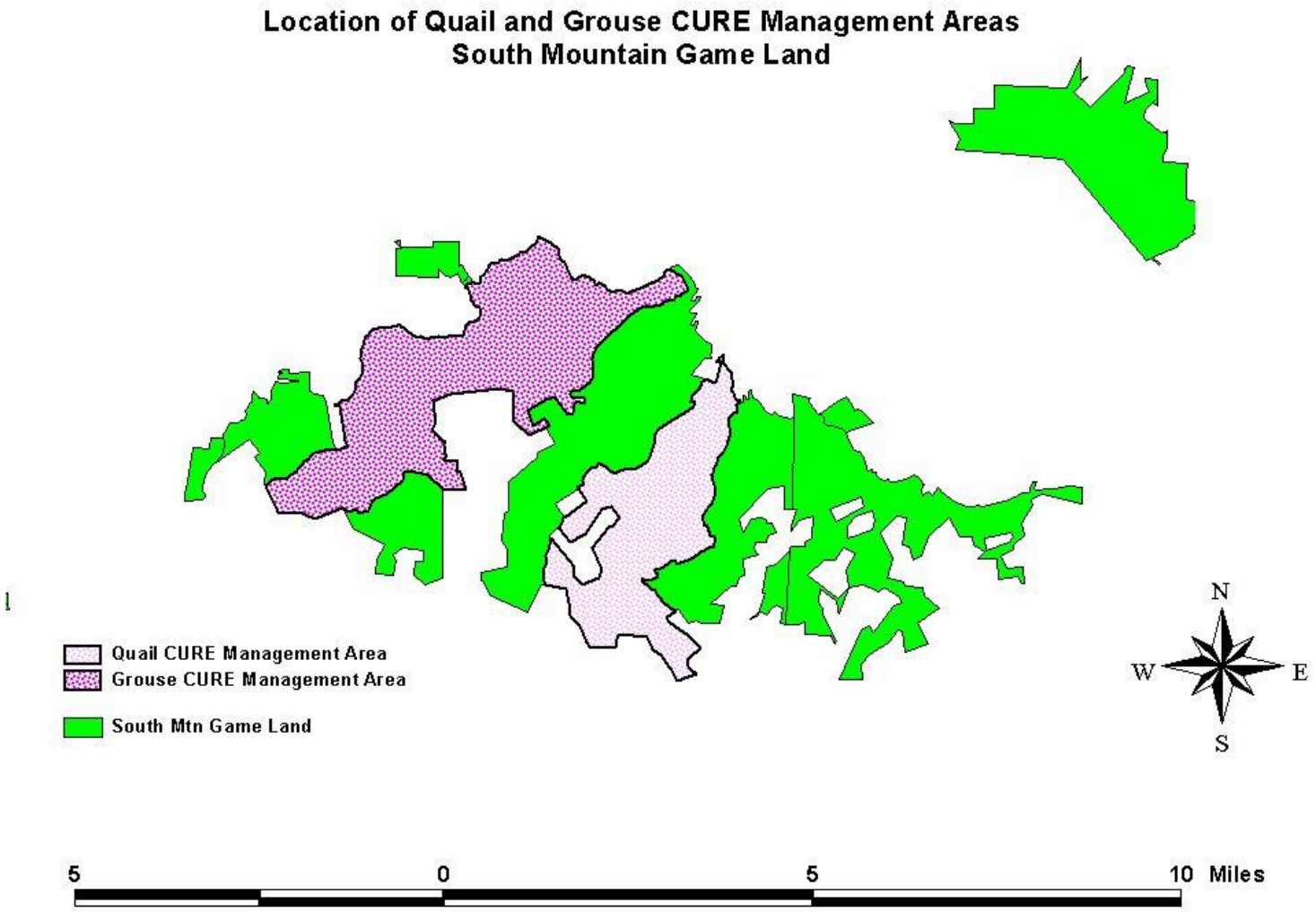
	Northern bobwhite CURE Area (3,000 acres)	**Grouse CURE Area (4,700 acres)**		**TOTAL**
Prescribed Burning	1,558 acres	921 acres		**2,479 acres**
Timber Sales	248 acres	0 acres		**248 acres**
Pre-commercial Thinning	83 acres	0 acres		**83 acres**
Field Development	53.4 acres	19 acres		**72.4 acres**
Aerial Spraying	226 acres	0 acres		**226 acres**
Recently clear-cut areas allowed to grow	38 acres	1,267 acres		**1,305 acres**
TOTALS	**2,206.4 acres**	**2,207 acres**		**4,413.4 acres**
% of managed area	73%	47%		

Table 7. Summary of planned expenditure for South Mountains CURE areas, 2001-2011. Please see Table 6 and Map 11 for a summary of all management activities and locations.

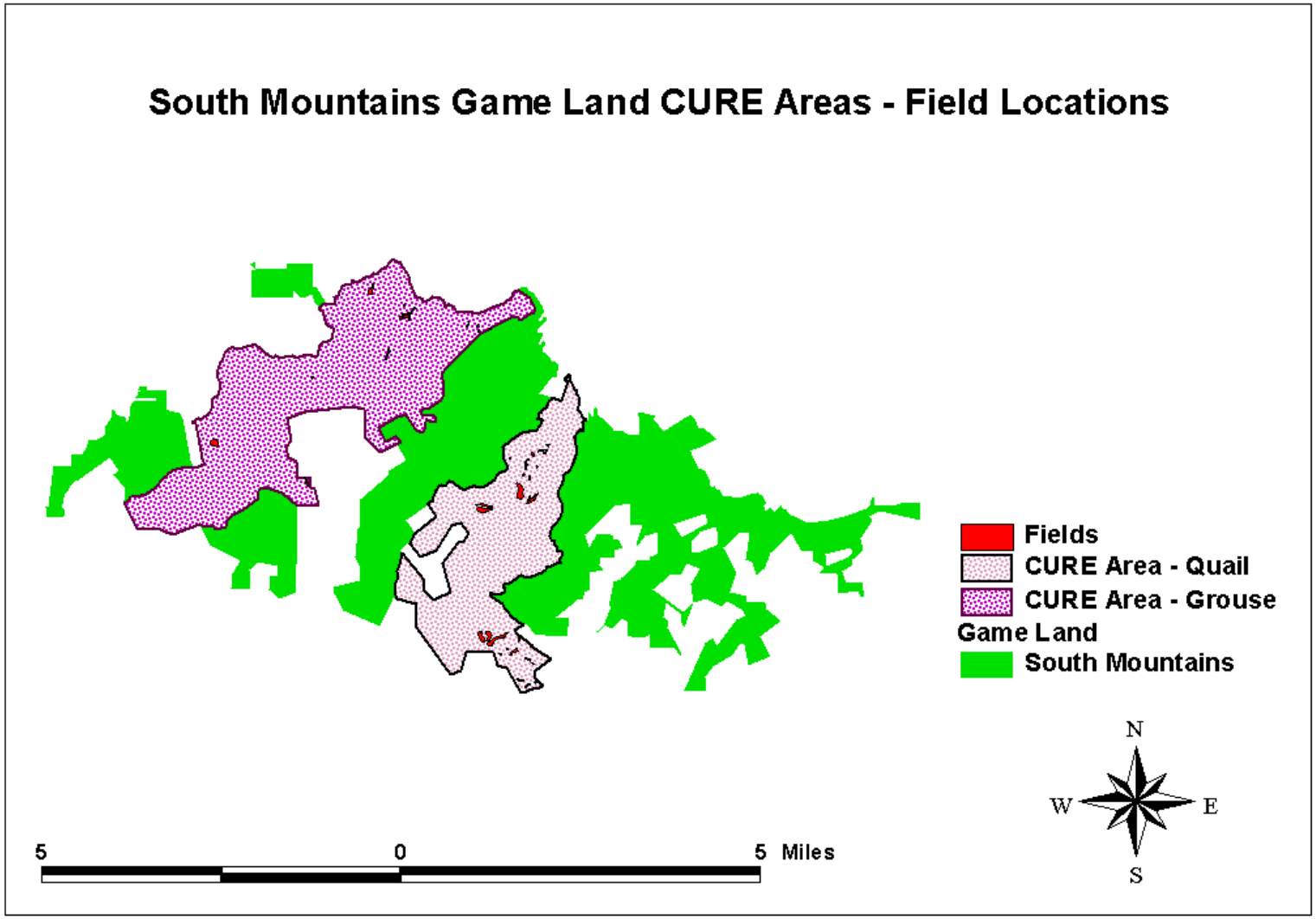
Year	Item	Est. Cost
2001-2002	Hire Morganton Crew*	$100,000
2002-2003	ATV's, other equipment, burning*	$32,000
2003-2004	Dozer, aerial spraying, burning**	$158,000
2004-2005	Burning	$4,000
2005-2006	Pre-commercial timber thinning, site prep., burning	$40,000
2006-2007	Burning	$6,000
2007-2008	Site Preparation, burning	$35,000
2008-2009	Forest Inventory, burning	$25,000
2009-2010	Forest Inventory, burning	$27,000
2010-2011	Forest Inventory, burning	$27,000
		$454,000.00

* Completed
** Approved and in progress

Map 1.

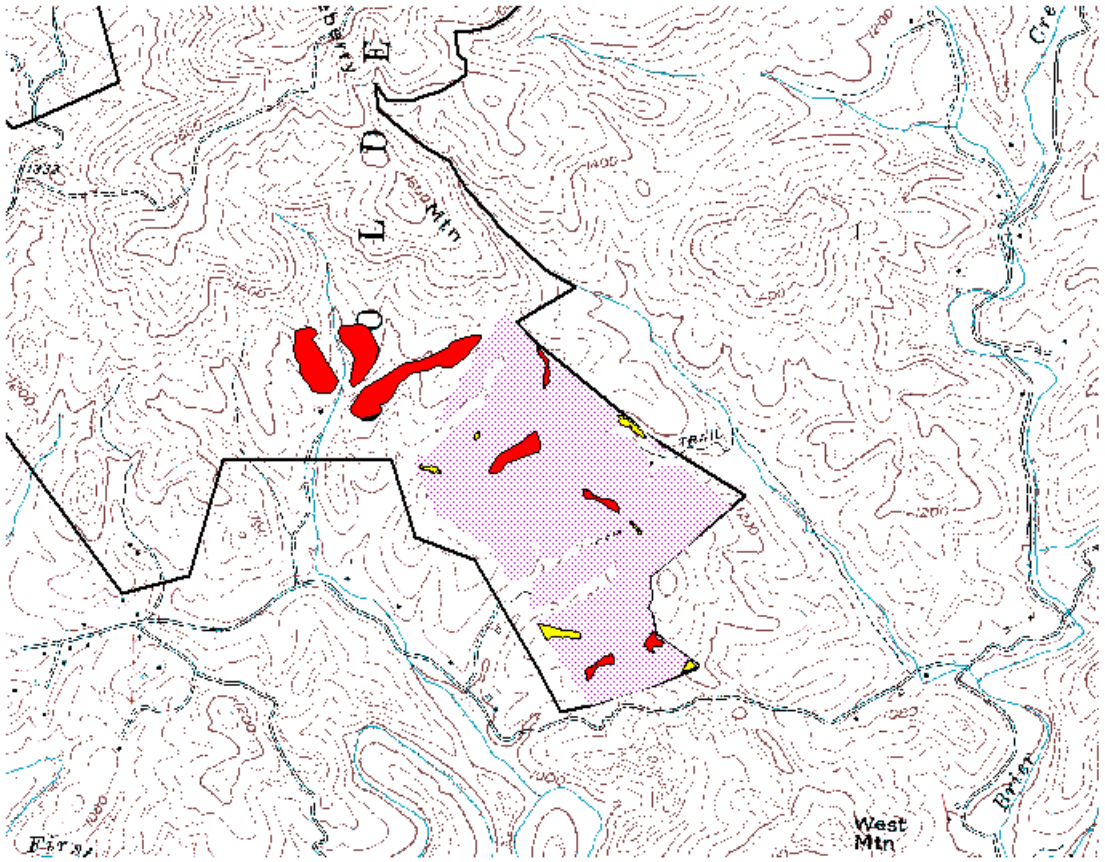

Location of Quail and Grouse CURE Management Areas
South Mountain Game Land
Quail CURE Management Area
Grouse CURE Management Area
South Mtn Game Land
N
W
E
S
5
0
5
10 Miles

Map 2.


South Mountains Game Land CURE Areas - Field Locations
Fields
CURE Area - Quail
CURE Area - Grouse
Game Land
South Mountains
N
W
E
S
5
0
5 Miles

Map 3.

Field Locations - Golden Valley Clear Cut
(Table Reference - 1,2)



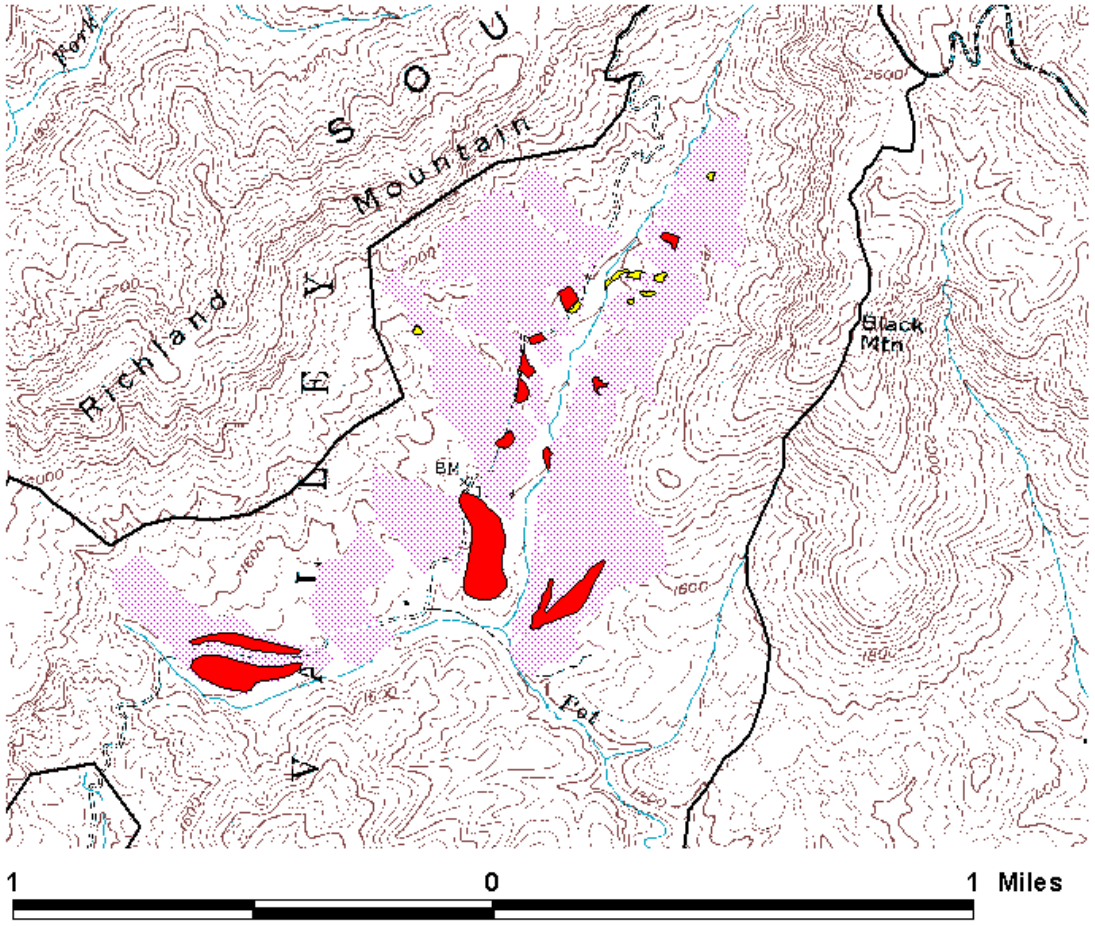
0.7 0 0.7 1.4 Miles

Field Type
- Fallow
- NWSG/Forb
- Cool Season Legume
- Golden Valley Clear Cut
- CURE Area - Quail

N
W E
S

Map 4.

Field Locations - Pots Branch Clearcut
(Table Reference - 3,4)

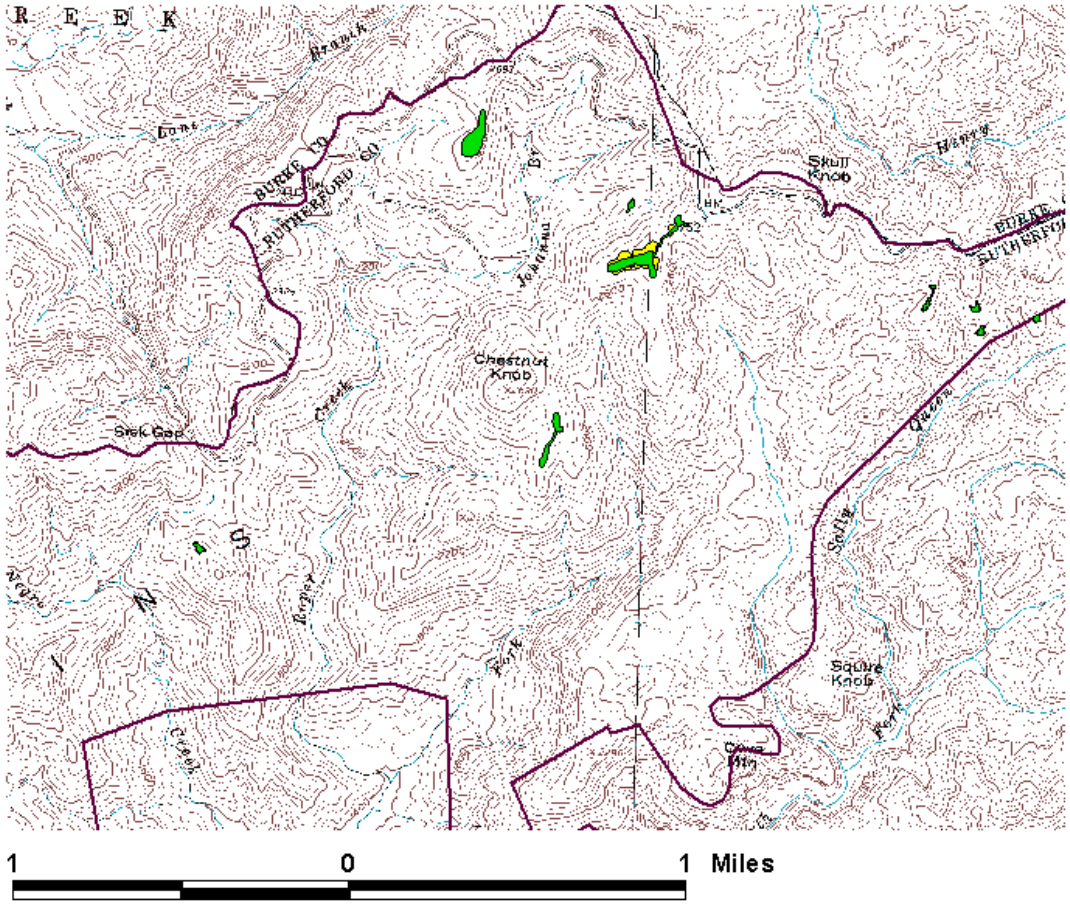


Field Type
- Fallow
- NWSG/Forb
- Cool Season Legume
- Pots Branch Clear Cut
- CURE Area - Quail

N
W
E
S

Map 5.

Field Locations - Grouse Management Area, East
(Table Reference - 5,6)

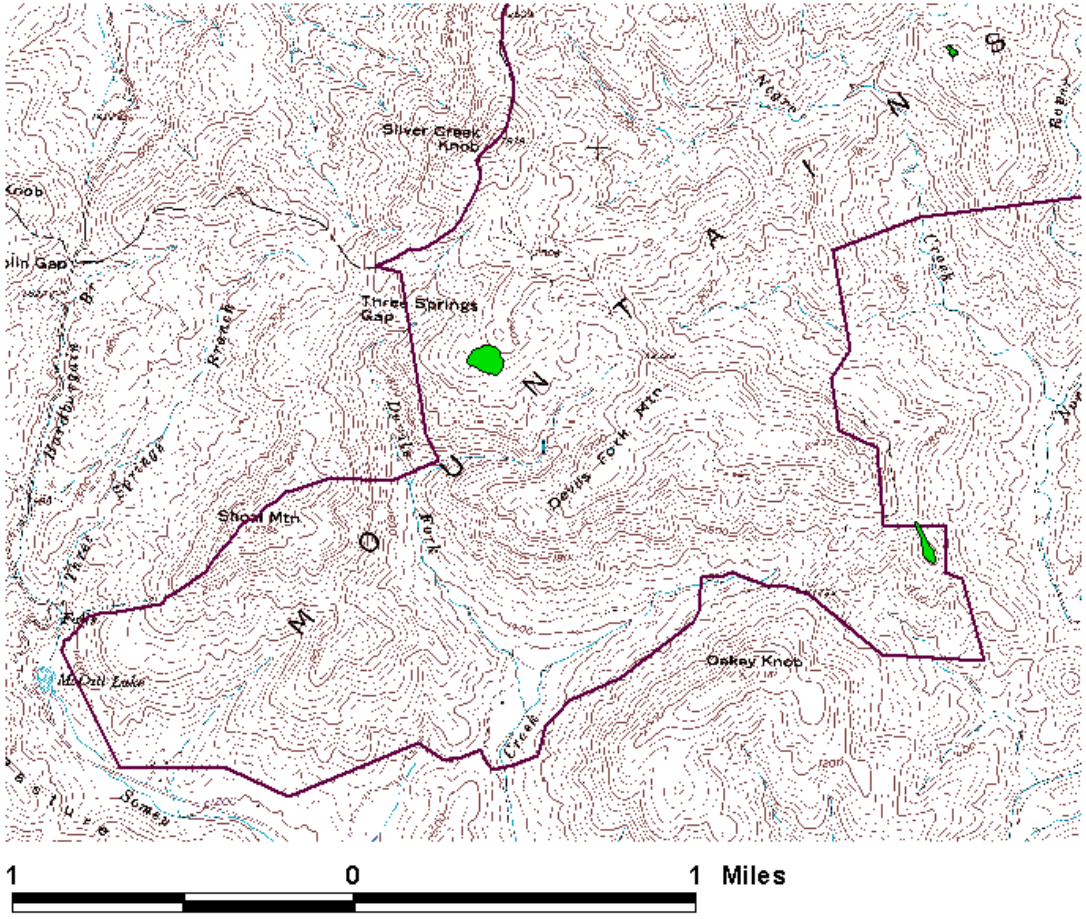


Field Type
- Fallow
- NWSG/Forb
- Legume
- CURE Area - Grouse

N
W E
S

Map 6.

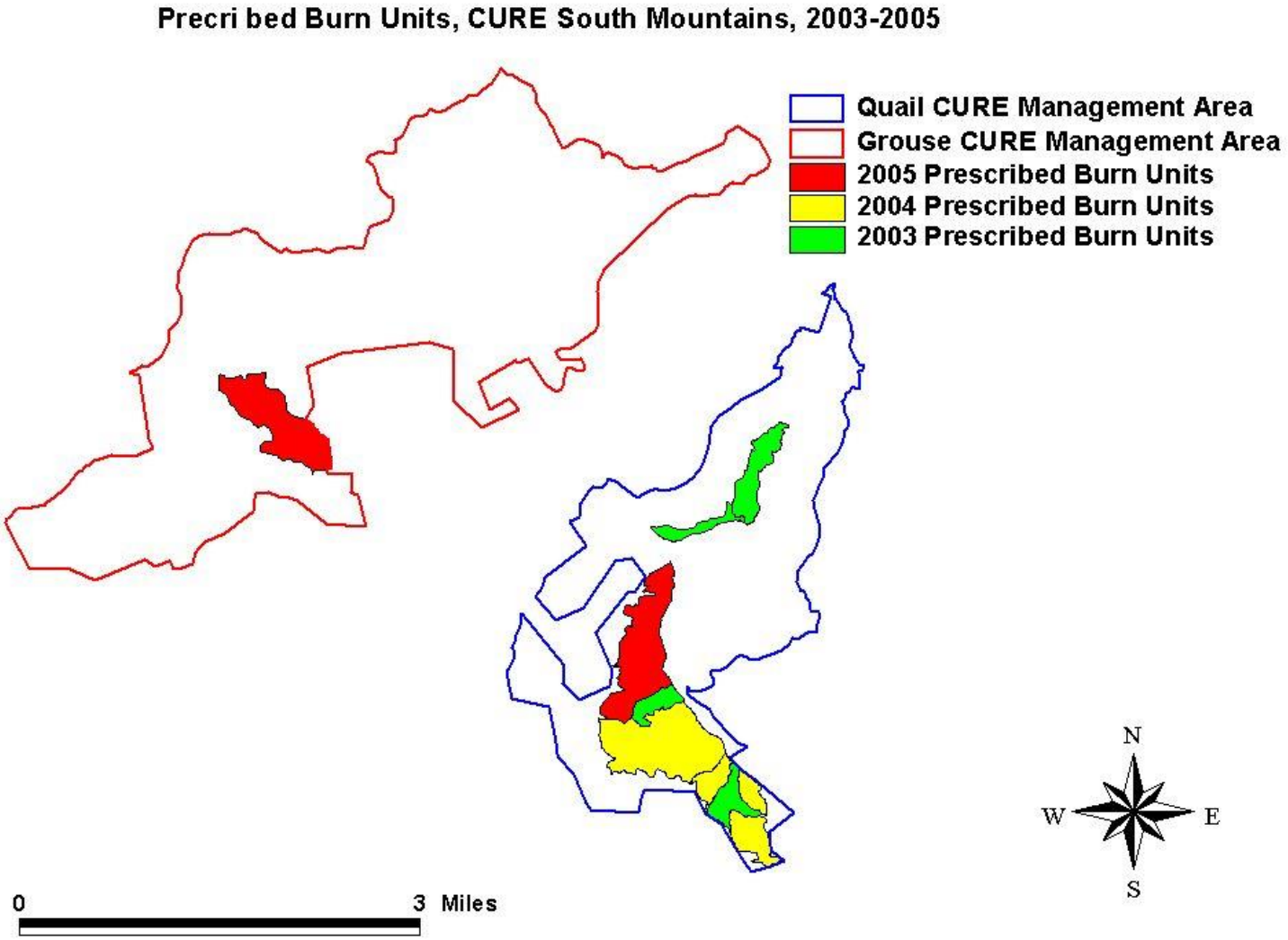
Field Locations - Grouse Management Area, West
(Table Reference - 5,6)



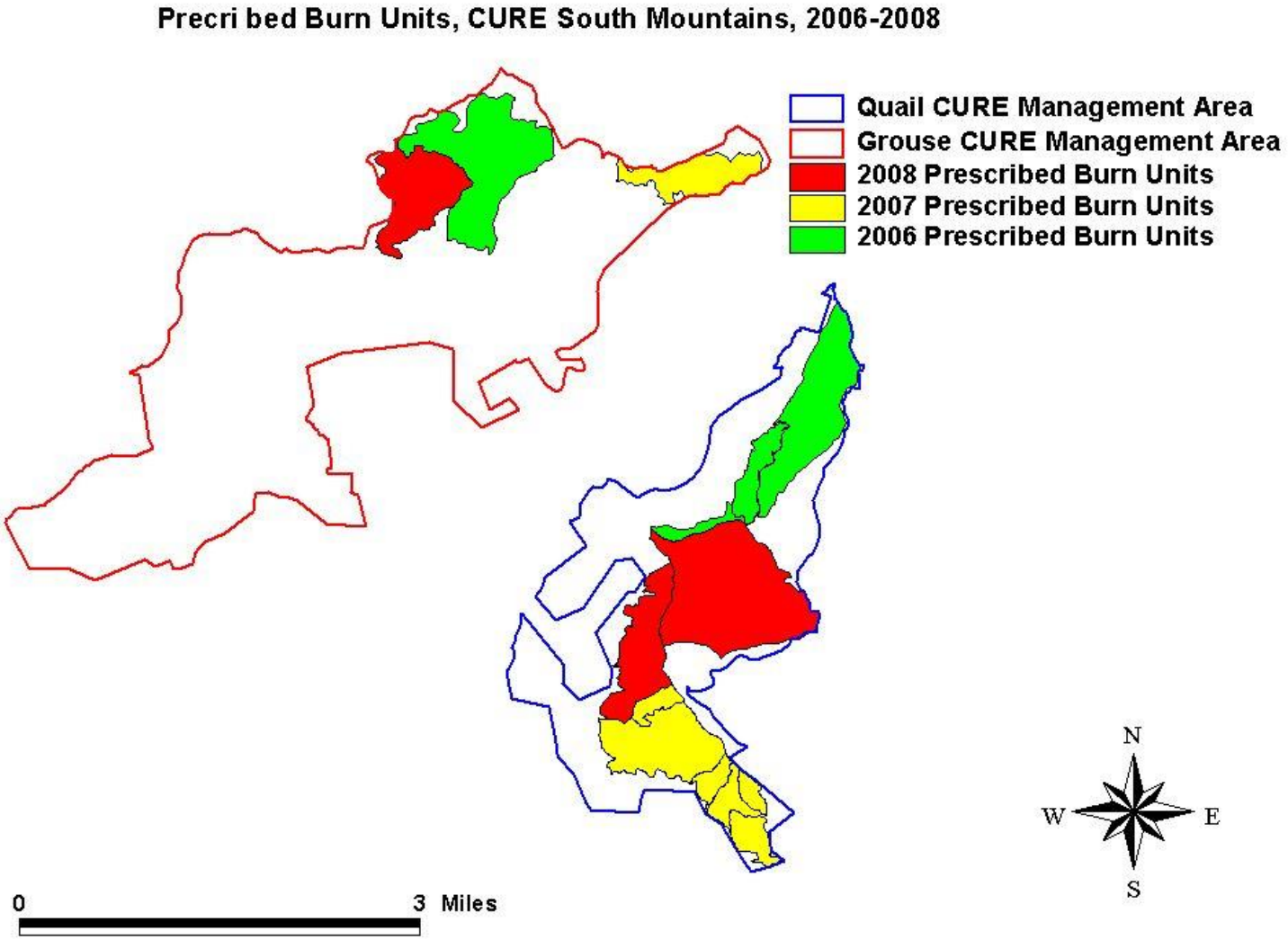
Field Type
- Fallow
- NWSG/Forb
- Legume
- CURE Area - Grouse

N
W E
S

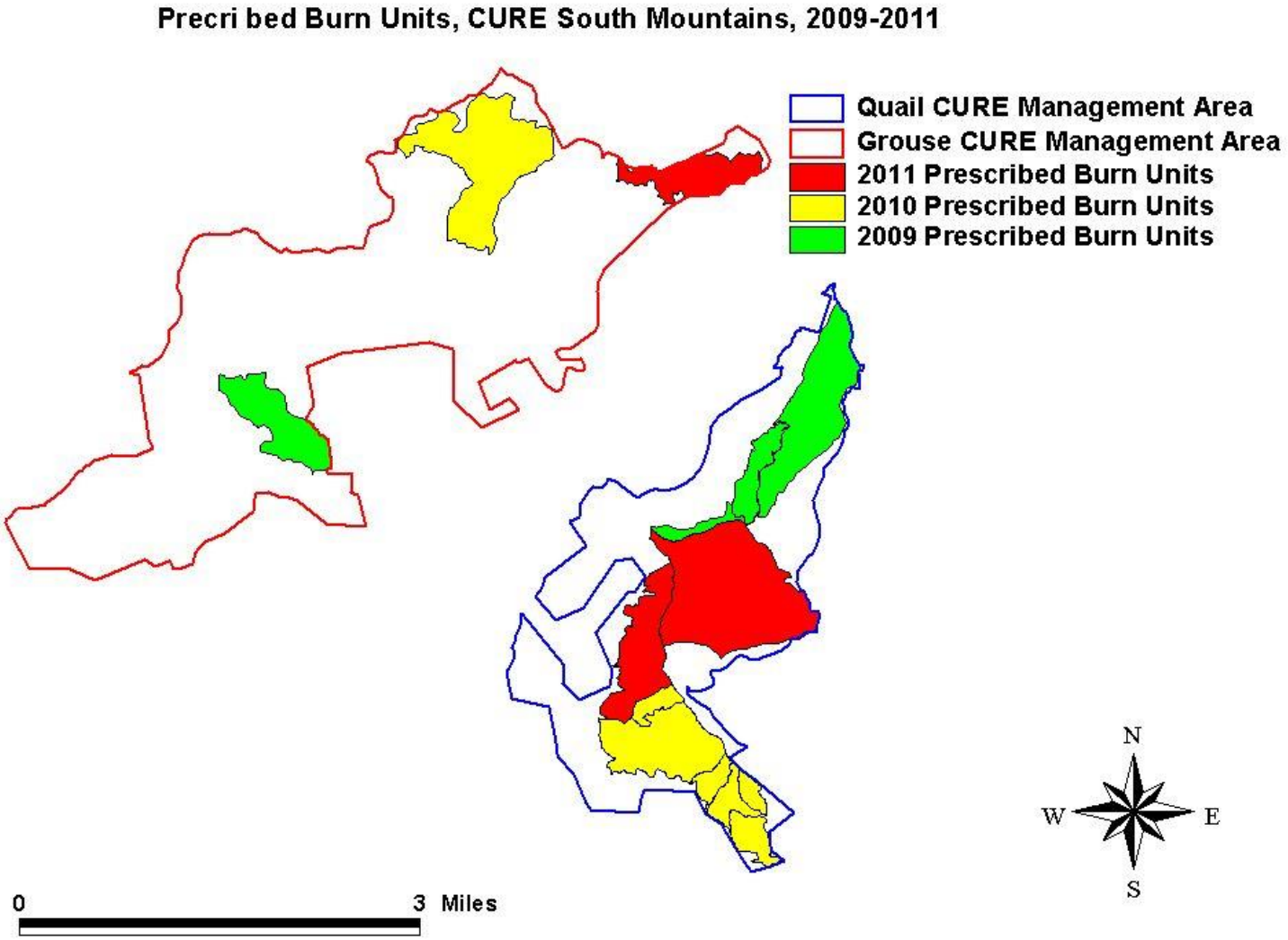
Map 7.


Precri bed Burn Units, CURE South Mountains, 2003-2005
Quail CURE Management Area
Grouse CURE Management Area
2005 Prescribed Burn Units
2004 Prescribed Burn Units
2003 Prescribed Burn Units
N
W
E
S
0
3 Miles

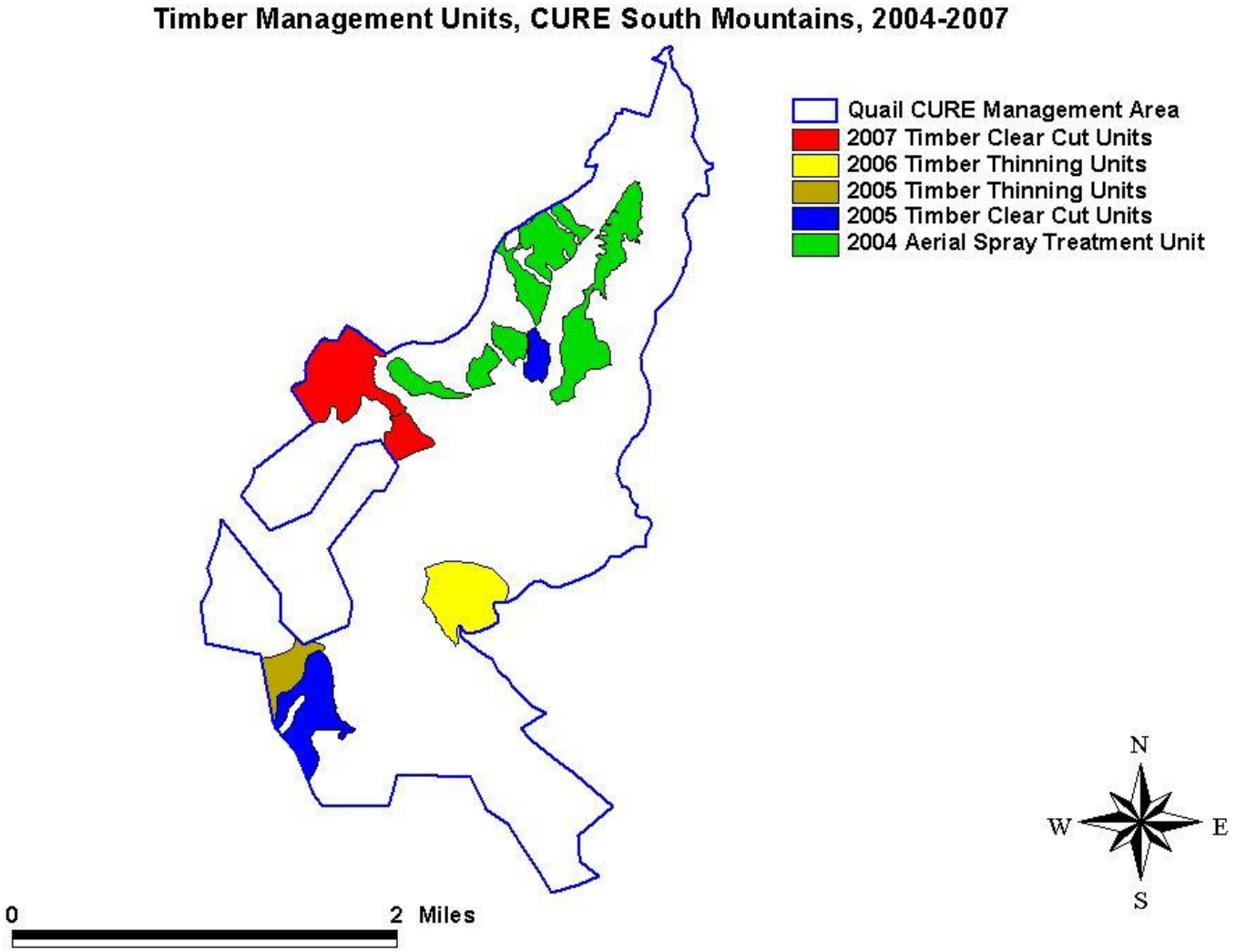
Map 8.


Precri bed Burn Units, CURE South Mountains, 2006-2008
Quail CURE Management Area
Grouse CURE Management Area
2008 Prescribed Burn Units
2007 Prescribed Burn Units
2006 Prescribed Burn Units
N
W
E
S
0
3 Miles

Map 9.

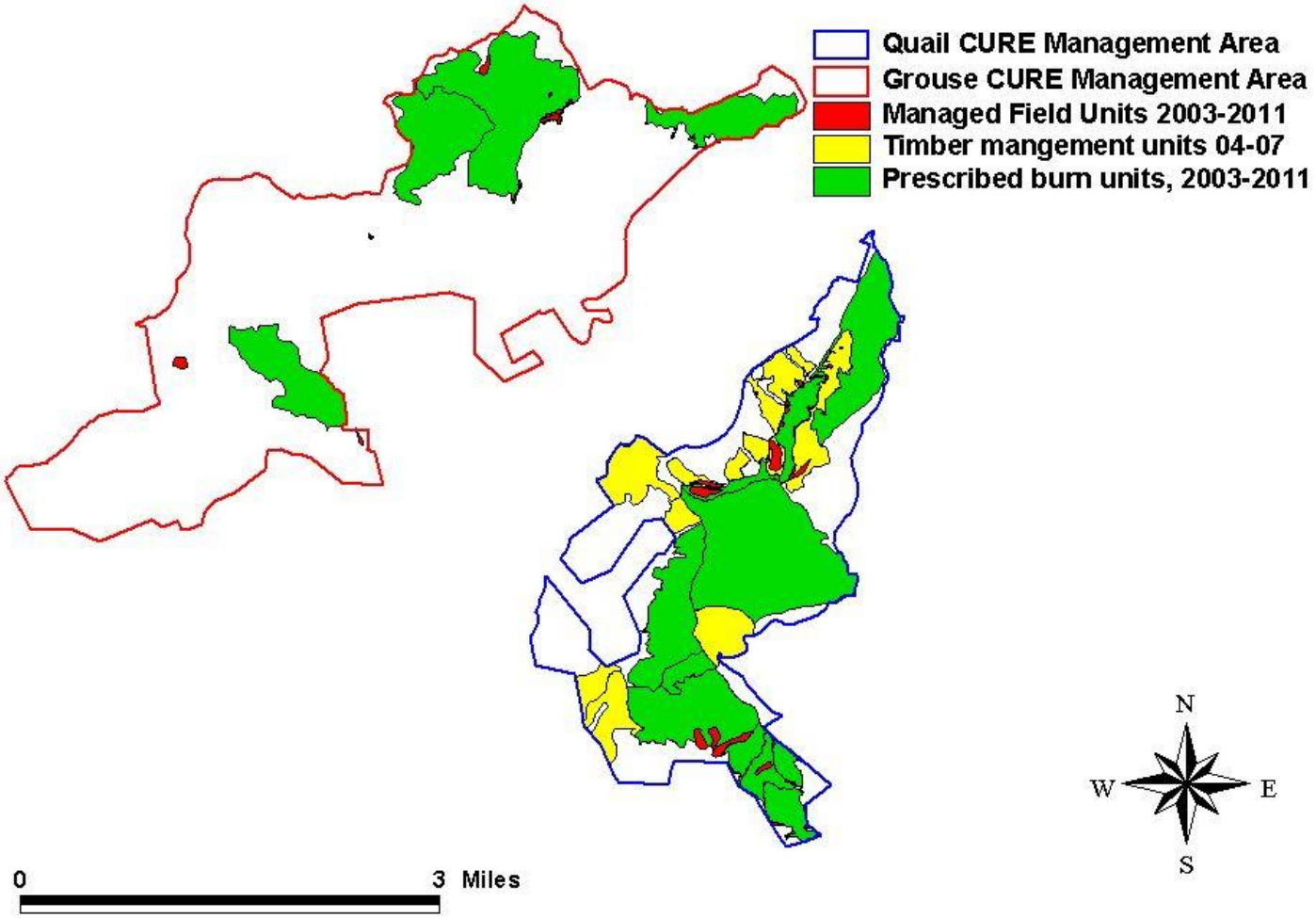

Precri bed Burn Units, CURE South Mountains, 2009-2011
Quail CURE Management Area
Grouse CURE Management Area
2011 Prescribed Burn Units
2010 Prescribed Burn Units
2009 Prescribed Burn Units
N
W
E
S
0
3 Miles

Map 10.


Timber Management Units, CURE South Mountains, 2004-2007
Quail CURE Management Area
2007 Timber Clear Cut Units
2006 Timber Thinning Units
2005 Timber Thinning Units
2005 Timber Clear Cut Units
2004 Aerial Spray Treatment Unit
N
W
E
S
0
2 Miles

Map 11.

All Timber, Field and Burn Units, CURE South Mountains, 2003-2011



APPENDIX 3 – NATURAL HERITAGE ARTICLES OF DEDICATION

North Carolina
Department of Administration

Beverly Eaves Perdue, Governor

Britt Cobb, Secretary

January 19, 2010

Secretary Dee Freeman
Department of Environment and Natural Resources
1615 Mail Service Center
Raleigh, North Carolina 27699-1615

Mr. Gordon S. Myers, Executive Director
N.C. Wildlife Resources Commission
1701 Mail Service Center
Raleigh, North Carolina 27699-1701

Re: Dedication of Portions of the **Johns River Game Land**, Burke County

Dear Secretary Freeman and Mr. Myers:

Pursuant to Article 9A, Chapter 113A of the North Carolina General Statutes, this letter of allocation is executed for the purpose of dedicating the State-owned lands hereinafter described as a North Carolina Nature Preserve.

This real property is currently administered by the North Carolina Wildlife Resources Commission as a portion of the Johns River Game Land and consists of approximately 1,007 acres located in Burke County, and composed of:

1. Johns River Game Land tract (Primary Area)	153 acres
2. Johns River Game Land (Buffer Area)	854 acres

all of which are specifically described in Exhibit A, attached hereto and by reference made a part hereof. The dedicated land shall be known collectively as the **JOHNS RIVER GAME LAND DEDICATED NATURE PRESERVE**.

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919) 807-2425
Fax (919) 733-9571
State Courier #51-01-00
e-mail britt.cobb@doa.nc.gov
An Equal Opportunity Affirmative Action Employer

Location Address:
116 West Jones Street
Raleigh, North Carolina 27603

Dedication of the qualified portion of the tract fulfills the terms of any prior grant agreement, including that of the Clean Water Management Trust Fund.

The Governor and Council of State have approved the dedication of the State-owned lands hereinabove described as the Johns River Game Land Dedicated Nature Preserve to be held in trust by the Custodian for the uses and purposes expressed in the Nature Preserves Act at a meeting held in the City of Raleigh, North Carolina, on the 4th day of August, 2009.

Sincerely,

Britt Cobb

BC:ke

Attachment

CONSENTED AND AGREED TO:

Secretary Dee Freeman
Department of Environment and Natural Resources

Gordon S. Myers, Executive Director
Wildlife Resources Commission

EXHIBIT A

JOHNS RIVER GAME LAND
DEDICATED NATURE PRESERVE

COUNTY: Burke County PHYSIOGRAPHIC PROVINCE: Piedmont/Southern Foothills

SIZE OF AREA: ca. 1,007 acres (153 acres primary; 854 acres buffer)

OWNER/ADMINISTRATOR: State North Carolina, Wildlife Resources Commission

LOCATION: Located along the north side of the John's River between Chesterfield and Morganton, the Johns River Game Land protects buffers on the Johns River and tributaries upstream from Lake Rodhiss.

DESCRIPTION: This game land protects rolling hills dissected by several channels on the north side of the Johns River. The tract mainly consists of dense young stands of Virginia pine (*Pinus virginiana*) and white pine (*P. strobus*) and open fields. A network of gravel roads provides access. Immediately upstream from the Game Land, the aquatic habitat is known to support a population of Brook Floater (*Alasmidonta varicosa*), which is a Federal species of Concern and listed as Endangered by the NC Wildlife Resources Commission. Because the riparian Primary Areas are designated mainly for protection of aquatic features, the condition of the terrestrial natural communities does not need to be high-quality. These riparian zones have been altered by past timber harvest and conversion to fields, but should be allowed to succeed to mature forests.

BOUNDARY JUSTIFICATION: The primary areas include 100-foot riparian areas adjacent to the river and on each side of all perennial tributaries flowing into the Johns River. The designation is mandated by the funding source, the Clean Water Management Trust Fund, as a minimum primary riparian area to be dedicated on state agency lands acquired with their funds. There are no other natural areas or riparian areas which qualify for dedication.

MANAGEMENT AND USE: The dedicated nature preserve will be managed as the Johns River Game Land, for protection of wildlife habitat and public hunting by permit. Within riparian primary areas, existing fields will be allowed to naturally regenerate and forests will be allowed to mature. Control of exotic and invasive species, especially prevalent along existing roads, should be implemented.

THIS DEDICATION OF THE JOHNS RIVER GAME LAND NATURE PRESERVE IS MADE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. As used in this Letter, the terms "natural area" and "nature preserve" shall have the same meaning as contained in North Carolina General Statutes, section 113A-164.3.

2. Pursuant to North Carolina General Statutes 113-164.8, all State-owned lands lying within the above designated area(s) are hereby dedicated as a nature preserve to be known collectively as the Johns River Game Land Nature Preserve (hereinafter "preserve") for the purposes provided in the North Carolina Nature Preserves Act, as amended, and other applicable law, and said State-owned land, shall be held, maintained, and used exclusively for said purposes.

3. **Primary Custodian**: The primary custodian of the preserve will be the North Carolina Wildlife Resources Commission, which will be responsible for managing the preserve in accordance with State Administrative Code 15 NCAC 12H.300.

4. **Primary Classification**: The primary classifications and purposes of the preserve will be conservation, nature education, wildlife management, hunting, fishing, trapping, and other recreational uses authorized by the Primary Custodian. The ecological significance of the preserve is described in Exhibit A.

5. **Management Areas**: For the purposes of management, the preserve shall be considered to consist of a Primary Area (approximately 153 acres) and a Buffer Area (approximately 854 acres), as more particularly described in Exhibit A, attached thereto and by this reference made a part hereof.

   The Primary Area consists essentially of the riparian Primary Areas adjoining the Johns River and its tributaries, protecting water quality within the river. The Primary Area is deemed by the Secretary of the North Carolina Department of Environment and Natural Resources to qualify as an outstanding natural area under statutory criteria for nature preserve dedication (G.S. 113A-164.6) and further serves all of the public purposes for a dedicated preserve as stated in Administrative Rules 15 NCAC 12H.0301(b).

   The Buffer Area, which contributes to the management and protection of the Primary Area, consists primarily of adjoining pine plantations.

6. **Rules for Management of the Primary Area(s)**:

   A. Character of Visitor Activity: The principal visitor activities in the preserve shall be hunting, fishing, trapping, walking, research, and observation. These activities shall be regulated by the Custodian to prevent significant disturbance of the preserve. These activities may specifically be regulated by the Custodian to protect and conserve the natural values of the preserve.

      Activities and uses unrelated to those listed above are prohibited except as otherwise provided in these Articles or unless necessary to carry out the purposes of the preserve. Prohibited activities include, but are not limited to: construction; commercial activities and development; commercial silviculture; agriculture and grazing; gathering of native species of plants or plant products; the removal, disturbance, molestation, or defacement

of minerals, archaeological and natural resources, except for research purposes as approved by the Custodian; and those activities specifically restricted in these Articles.

There shall be no fires, except as necessary for ecological management of the preserve or in conjunction with supervised educational activities of the Custodian, or further excepted as herein provided or otherwise expressly permitted.

B. Consumptive Wildlife Uses: Hunting, fishing, and trapping shall be permitted on the preserve subject to regulations and management by the North Carolina Wildlife Resources Commission.

C. Orientation and Guidance of Visitors: The Custodian reserves the right to orient and guide visitors for educational programs, hunting and fishing uses, scientific research, and for preserve management. Exhibits, programs, and printed materials may be provided by the Custodian in service areas. The Custodian may restrict access to visitors in those instances or in such areas that restrictions may be determined necessary to safeguard sensitive environmental resources in the preserve.

D. Disturbance of Natural Resources: The cutting or removal of trees, dead or alive, or the disturbance of other natural resources is prohibited except as necessary for removal of hazards to visitors, control of disease or insect infestations that would damage or reduce the significance of the preserve, restoration after severe storm damage, trail clearance and maintenance, or for purposes of maintenance or restoration of natural communities or rare species populations as stipulated in the preserve management plan and that which is consistent with the purposes of these Articles. Salvage timber cuts which may be necessary due to natural catastrophe will be allowed in both Primary and Buffer Areas, but in a manner that will contribute to the recovery of the prevailing natural conditions of the forest and in consultation with the North Carolina Natural Heritage Program.

E. Wild Fire Control/Prescribed Burning: Wild fires may mimic natural processes historically occurring in an ecosystem on a landscape level. When the extent of a wild fire does not threaten human life or structures, it may be allowed to burn with minimal control. If wild fire control is necessary, firebreaks may need to be established. When possible, existing roads and firebreaks will be utilized for wild fire control. When new firebreaks need to be established, environmentally sensitive areas will be avoided when possible. Old firebreaks which affect the natural hydrology of wetlands will be filled and allowed to revegetate. Planning of firebreak restoration should occur in consultation with the North Carolina Natural Heritage Program.

F. Water Control: The purpose of water control shall be to maintain the preserve's natural water regime. Water levels that have been altered by man may be changed if necessary to restore the preserve to its natural condition. In a preserve with a long history of managed hydrology, water levels may be managed to perpetuate the ecosystems that have evolved around the hydrology or may be restored to natural condition. This decision should be made in consultation with the Natural Heritage Program. Millponds are an example of situations in which water levels have been historically managed.

G. Pollution and Dumping: There will be no storage or dumping of ashes, trash, garbage, hazardous substances, toxic waste, other unsightly or offensive material, or fill material, including dredge spoil in, on, or under the preserve. No underground storage tanks may be placed within the preserve. No surface or ground waters of the preserve may have pollutants added within the preserve.

H. Control of Vegetational Succession: Control of vegetational succession may be undertaken if necessary to maintain or restore a particular natural ecosystem type or to preserve endangered, threatened, rare, or other unusual species. Controls will be done in the manner that best imitates the natural forces believed responsible for maintaining the natural ecosystem type, or that minimizes unnatural effects on non-target portions of the ecosystem. Prescribed burning is particularly essential to ecosystems where natural wild fire historically suppressed woody vegetation and promoted herbaceous diversity.

I. Control of Populations: Any control of animal or plant populations on the preserve shall be for the purpose of correcting those situations where those populations are significantly affecting natural conditions on the preserve, and in accordance with the Custodian's established regulations for hunting, trapping, or fishing of designated game animals. The Custodian may, in consultation with the North Carolina Natural Heritage Program, apply biological controls, herbicides and pesticides, and other means deemed necessary or appropriate to control or eradicate exotic or native species of plant or animal that are degrading the natural character of the preserve. Because of potential impacts on native species, no exotic flora or fauna shall be introduced into the preserve.

J. Research and Collecting Permits: Any person wishing to engage in scientific research requiring collecting or otherwise affecting anything within the preserve shall first secure written permission from the Custodian.

K. Roads and Trails: New roads shall not be constructed in the Primary Area. When necessary, the Custodian may construct and maintain access limited to staff use for management purposes, such as service paths (single lane vegetated paths) for patrol, right-of-way maintenance, and other management activities, within the Primary Area. Number and width of new paths will be minimized, and sensitive areas avoided when possible. Existing roads that occur within or form a boundary of the Primary Area may be maintained by grading of the roadbed, replacing culverts, or adding stone as needed in order to maintain the integrity of the road for vehicular use. Daylighting of roads within the Primary Area should be minimized, but may be used if necessary to maintain the condition of the road. Access management and construction will be part of the overall management planning process and will include consultation with the North Carolina Natural Heritage Program.

L. Other Structures and Improvements: Structures or facilities shall not be erected by the Custodian within a preserve, except as may be consistent with the purposes of the preserve as stated in this dedication. Site selection shall be consistent with this dedication.

M. Management Plan: The Wildlife Resources Commission, as Primary Custodian of the preserve, shall be required to prepare and submit for approval to the Secretary of the Department of Environment and Natural Resources a management plan for the preserve.

The management plan will be part of the larger management plan developed for the gamelands. This plan shall be subject to all the provisions of this dedication and shall additionally be consistent with the management principles set forth in the North Carolina Administrative Code 15 NCAC 12H.0300 and such other regulations as may be established from time to time by the Secretary of the Department of Environment and Natural Resources. In any case where contradictions may arise between this instrument of dedication and other management regulations, the terms of this dedication shall take precedence.

7. **Rules for Management of the Buffer Area(s)**: Primary area rules also apply except that additional forestry and wildlife management activities may be planned and carried out as needed. Construction and maintenance of roads, trails, and other access structures within buffer area(s) of the preserve will be limited to the level necessary to appropriately manage the preserve. These activities will be conducted in accordance with policy of the N.C. Wildlife Resources Commission and general management philosophy as outlined in Commission planning documents, in addition to providing for the buffer functions in relation to the primary area(s). WRC rules and guidelines require the protection and enhancement of wildlife populations and habitat so that hunting, fishing, trapping and other wildlife recreational opportunities are available to citizens of this State. Forest management is primarily conducted to enhance wildlife habitat.

   Buffer functions within the dedicated area may include protecting the primary area(s) from indirect detrimental ecological effects, providing additional area for species and ecological processes that require larger areas, and providing important successional stages and disturbance regimes and other habitat diversity for wildlife. Based on these general objectives, the following buffer functions will be addressed in the management plan:

   1) Landscape level function of community type and structure. (Buffer area management may involve timber harvest and other forms of stand manipulation, but will not involve forest canopy type conversion over more than limited areas, other than to restore stands to types suited for the site. Introduction of exotic species known to be invasive in natural communities will be avoided.)
   2) Maintenance of habitat connectivity and continuity among primary areas.
   3) Providing for habitat diversity.
   4) Management needs of rare animal and plant species populations occurring within the buffer area; and
   5) Protection of soil and hydrologic resources and processes within the primary area and extending into the buffer. (Buffers will be retained along streams, and watersheds of primary areas will be protected from hydrologic alteration.)

8. **Amendment and Modification**: The terms and conditions of this dedication may be amended or modified upon agreement of the Wildlife Resources Commission and Secretary of the Department of Environment and Natural Resources, and approved by the Council of State. Any portion of the tract dedicated pursuant to this instrument may be removed from dedication in accordance with the provisions of North Carolina General Statutes 113A-164.8.

9. **Permanent Plaque**: The Custodian should erect and maintain a permanent plaque or other appropriate marker at a prominent location within the preserve bearing the following statement: "This Area is Dedicated as a State Nature Preserve."

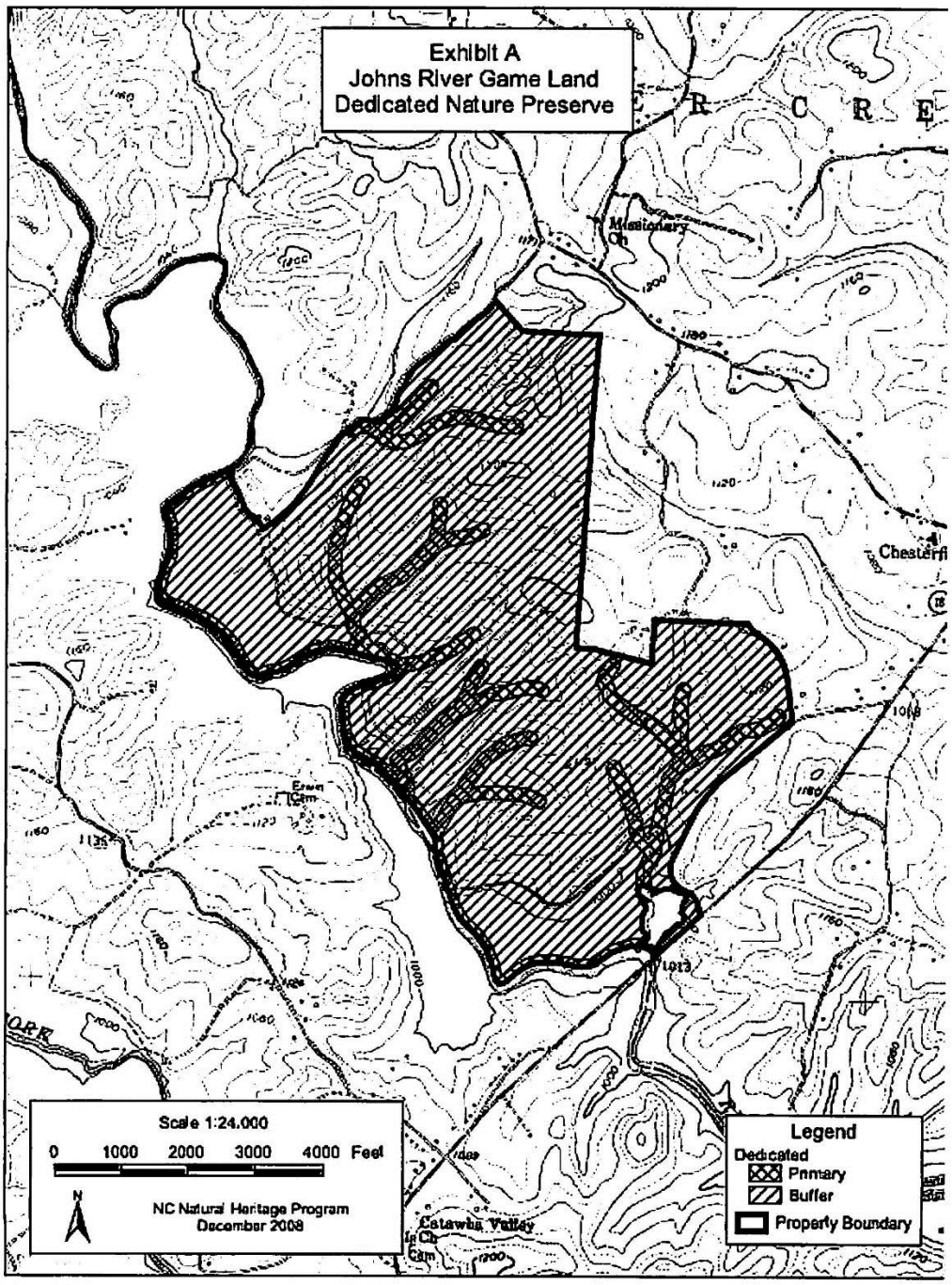


Exhibit A
Johns River Game Land
Dedicated Nature Preserve
Scale 1:24,000
0 1000 2000 3000 4000 Feet
N
NC Natural Heritage Program
December 2008
Legend
Dedicated
Primary
Buffer
Property Boundary

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

August 31, 2007

Secretary William G. Ross, Jr.
Department of Environment and Natural Resources
1615 Mail Service Center
Raleigh, North Carolina 27699-1615

Mr. Fred Harris, Interim Executive Director
N.C. Wildlife Resources Commission
1701 Mail Service Center
Raleigh, North Carolina 27699-1701

Re: Dedication of Portions of the **South Mountains Game Land**, Rutherford, Cleveland, Burke, and McDowell Counties

Dear Secretary Ross and Mr. Harris:

Pursuant to Article 9A, Chapter 113A of the North Carolina General Statutes, this letter of allocation is executed for the purpose of dedicating the State-owned lands hereinafter described as a North Carolina Nature Preserve. These articles of dedication replace the articles of dedication dated April 5, 2006. The articles were amended to reflect additions of property to the preserve.

These real properties are currently administered by the North Carolina Wildlife Resources Commission as a portion of the **South Mountains Game Land** and consists of approximately 16,993 acres located in **Rutherford, Cleveland, Burke, and McDowell Counties** and composed of:

1. South Mountains tracts (Primary Area)	9,661 acres
2. South Mountains tracts (Special Management Area)	359 acres
3. South Mountains tracts (Buffer Area)	6,973 acres

which are specifically described in Exhibit A, attached hereto and by reference made a part hereof. The dedicated land shall be known collectively as the South Mountains Game Land Nature Preserve.

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919) 807-2425
Fax (919) 733-9571
State Courier #51-01-00
e-mail Britt.Cobb@ncmail.net
An Equal Opportunity/Affirmative Action Employer

Location Address:
116 West Jones Street
Raleigh, North Carolina

023.0010
NAT- [redacted]

Dedication of the qualified portions of the tracts fulfills the terms of any prior grant agreements, including those of the Natural Heritage Trust Fund, the Clean Water Management Trust Fund, and the Ecosystem Enhancement Program. Specifically, of the 1,715-acre addition included in this dedication agreement, the Lone Mountain portion was funded by all three funding sources, while the Bolin Knob portion was funded by the Natural Heritage Trust Fund and the Clean Water Management Trust Fund.

The Governor and Council of State have approved the dedication of the State-owned lands hereinabove described as the South Mountains Game Land Dedicated Nature Preserve to be held in trust by the Custodian for the uses and purposes expressed in the Nature Preserves Act at a meeting held in the City of Raleigh, North Carolina, on the 5th day of June, 2007.

Sincerely,

Britt Cobb

BC

CONSENTED AND AGREED TO:

Secretary William G. Ross, Jr.
Department of Environment and Natural Resources

Fred Harris, Interim Executive Director
Wildlife Resources Commission

EXHIBIT A

SOUTH MOUNTAINS GAME LAND DEDICATED NATURE PRESERVE

COUNTY: Rutherford, Cleveland, Burke, and McDowell

PHYSIOGRAPHIC PROVINCE: Piedmont

TOPOGRAPHIC QUADS: Benn Knob and Dysartsville

SIZE OF AREA: 16,993 acres total
(primary area 9,661 acres; special management area 359 acres; buffer area 6,973 acres) (including current additions of 1,715 acres)

OWNER/ADMINISTRATOR: State of North Carolina
Wildlife Resources Commission

DESCRIPTION: The South Mountains are a large area of dissected high hills rising from the rolling Upper Piedmont landscape. While not as high in elevation as the Blue Ridge escarpment a short distance to the west, they are comparable in ruggedness. Most of this site consists of steep slopes, narrow ridges, and narrow ravines or stream gorges. The wild land core of the South Mountains, which includes South Mountains State Park, South Mountains Game Land, and Deaf School Watershed lands, is the largest contiguous natural forest landscape in the Piedmont of North Carolina. It provides the best opportunity to protect a substantial core area for forest interior species and for landscape scale ecosystem processes within the Piedmont Region.

The South Mountains Game Land Nature Preserve contains one of the largest concentrations of rare species in the South Mountains. These are listed below in Table 1 and Table 2. This diverse collection includes species disjunct from higher elevation areas in the Blue Ridge (where they are also rare) as well as some of the rarest plants in the Piedmont. Of particular note is a large population of white irisette (*Sisyrinchium dichotomum*), one of the largest populations in the world for this federally listed, narrowly endemic species. Also highly significant is the presence of the Broad River stream crayfish (*Cambarus lenati*), a very narrowly endemic species that is known only from a few locations in the headwaters of the First Broad River. The greatest number of rare plant species are associated with rock outcrops, but many species are scattered within the forests of the site, or even occur along old road beds in the woods. A large number are associated with the relatively high pH soils derived from mafic rocks. Mafic rocks apparently make up only a minority of the preserve, but support many of the rare plants. However, some species of acidic soils are also present.

The natural communities of the South Mountains consist mainly of high quality examples typical of the Blue Ridge, such as Chestnut Oak Forest, Montane Oak-Hickory Forest, Dry-Mesic Oak-Hickory Forest, Pine/Oak-Heath, Rich Cove Forest, Piedmont/Low Mountain Alluvial Forest, and Acidic

Cove Forest, which occur here in a disjunct patch. These communities cover most of the site, and include old-growth portions.

Of particular note are Low Elevation Rocky Summit communities on rock outcrops along the steep upper ridge and elsewhere. These open rocky communities are rare in the state, and support many of the rare plant species.

Table 1. Rare plant species known from South Mountain Game Land Nature Preserve

Scientific Name	Common Name	Status
Berberis canadensis	American barberry	significantly rare-throughout
Calystegia catesbiana ssp. *sericata*	Blue Ridge bindweed	significantly rare-throughout
Cirsium carolinianum	Carolina thistle	significantly rare-peripheral
Collinsonia tuberosa	Piedmont horsebalm	significantly rare-peripheral
Eupatorium godfreyanum	Godfrey's thoroughwort	significantly rare-peripheral
Liatris aspera	rough blazing star	significantly rare-peripheral
Liatris microcephala	small-headed blazing star	significantly rare-peripheral
Liatris turgida	shale-barren blazing star	significantly rare-throughout
Lonicera flava	yellow honeysuckle	significantly rare-peripheral
Monotropsis odorata	sweet pinesap	federal species-of-concern significantly rare-throughout
Saxifraga caroliniana	Carolina saxifrage	federal species-of-concern significantly rare-throughout
Sisyrinchium dichotomum	white irisette	Federally Endangered State Endangered
Thermopsis mollis	Appalachian golden-banner	significantly rare-peripheral
Trillium simile	sweet white trillium	significantly rare-limited

Table 2. Rare animal species known from South Mountains Game Land Nature Preserve

Cambarus lenati	Broad River stream crayfish	significantly rare
Celastrina neglectamajor	Appalachian azure	significantly rare
Speyeria diana	diana fritillary	federal species-of-concern significantly rare

BOUNDARY JUSTIFICATION: The primary boundary represents a core natural area that encompasses the rare species populations, the rare Low Elevation Rocky Summit natural communities, 100- to 300-foot primary areas along identifiable perennial stream channels, and other high quality natural community types typical of the Blue Ridge, including old-growth examples. Special Management Areas consist of areas that support rare species populations, but have historically been artificially managed (such as some utility line rights of way, fields, and roadsides). These areas may receive more intensive special management, as determined by the land manager in coordination with the Natural Heritage Program, that will protect and enhance rare species populations while at the same time promoting other management goals specific to the agency. The Buffer Area, which contributes to the management and protection of the Primary Area, consists of portions of the surrounding forest adjoining the Primary Area, including at least an additional 100-foot zone beyond the primary area along stream channels. The Buffer will function to reduce intrusion of edge effects into the Primary Area, contribute to connection of nearby natural areas, provide additional habitat for wider ranging animal species, and protect water quality and aquatic habitat. Several inholdings remain in private ownership within the primary, buffer or excluded areas. If they are acquired, these should be evaluated to determine whether they qualify for dedication as primary or buffer areas.

MANAGEMENT AND USE: The dedicated nature preserve will be managed as the South Mountains Game Land, for protection of wildlife habitat and public hunting. Improvement of wildlife habitat will occur in the buffer areas.

THIS DEDICATION OF THE **SOUTH MOUNTAINS GAME LAND** NATURE PRESERVE IS MADE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. As used in this Letter, the terms "natural area" and "nature preserve" shall have the same meaning as contained in North Carolina General Statutes, section 113A-164.3.

2. Pursuant to North Carolina General Statutes 113-164.8, all State-owned lands lying within the above designated area(s) are hereby dedicated as a nature preserve to be known collectively as the South Mountains Game Land Nature Preserve (hereinafter "preserve") for the purposes provided in the North Carolina Nature Preserves Act, as amended, and other applicable law, and said State-owned land, shall be held, maintained, and used exclusively for said purposes.

3. **Primary Custodian**: The primary custodian of the preserve will be the North Carolina Wildlife Resources Commission, which will be responsible for managing the preserve in accordance with State Administrative Code 15 NCAC 12H.300.

4. **Primary Classification**: The primary classifications and purposes of the preserve will be conservation, nature education, wildlife management, hunting, fishing, trapping, and other recreational uses authorized by the Primary Custodian. The ecological significance of the preserve is described in Exhibit A.

5. **Management Areas:** For the purposes of management, the preserve shall be considered to consist of a Primary Area (approximately 9,661 acres), a Special Management Area (approximately 359 acres), and a Buffer Area (approximately 6,973 acres), as more particularly described in Exhibit A, attached thereto and by this reference made a part hereof. The Primary Area consists essentially of the natural area encompassing the largest concentration of rare species in the South Mountains, rare Low Elevation Rocky Summit communities, and numerous high quality natural communities typical of the Blue Ridge, some of which are in old-growth condition.

   The Primary Area is deemed by the Secretary of the North Carolina Department of Environment and Natural Resources to qualify as an outstanding natural area under statutory criteria for nature preserve dedication (G.S. 113A-164.6) and further serves all of the public purposes for a dedicated preserve as stated in Administrative Rules 15 NCAC 12H.0301(b).

   The Buffer Area, which contributes to the management and protection of the Primary Area, consists of the surrounding forest bordering and connecting the Primary Area. The portions designated as buffer are generally less mature, lower quality examples of the common natural community types.

6. **Rules for Management of the Primary Area(s)**:

A. Character of Visitor Activity: The principal visitor activities in the preserve shall be hunting, fishing, trapping, walking, research, and observation. These activities shall be regulated by the Custodian to prevent significant disturbance of the preserve. These activities may specifically be regulated by the Custodian to protect and conserve the natural values of the preserve.

Activities and uses unrelated to those listed above are prohibited except as otherwise provided in these Articles or unless necessary to carry out the purposes of the preserve. Prohibited activities include, but are not limited to: construction; commercial activities and development; commercial silviculture; agriculture and grazing; gathering of native species of plants or plant products; the removal, disturbance, molestation, or defacement of minerals, archaeological and natural resources, except for research purposes as approved by the Custodian; and those activities specifically restricted in these Articles.

There shall be no fires, except as necessary for ecological management of the preserve or in conjunction with supervised educational activities of the Custodian, or further excepted as herein provided or otherwise expressly permitted.

B. Consumptive Wildlife Uses: Hunting, fishing, and trapping shall be permitted on the preserve subject to regulations and management by the North Carolina Wildlife Resources Commission.

C. Orientation and Guidance of Visitors: The Custodian reserves the right to orient and guide visitors for educational programs, hunting and fishing uses, scientific research, and for preserve management. Exhibits, programs, and printed materials may be provided by the Custodian in service areas. The Custodian may restrict access to visitors in those instances or in such areas that restrictions may be determined necessary to safeguard sensitive environmental resources in the preserve.

D. Disturbance of Natural Resources: The cutting or removal of trees, dead or alive, or the disturbance of other natural resources is prohibited except as necessary for removal of hazards to visitors, control of disease or insect infestation that would damage or reduce the significance of the preserve, restoration after severe storm damage, trail clearance and maintenance, or for purposes of maintenance or restoration of natural communities or rare species populations as stipulated in the preserve management plan and that which is consistent with the purposes of these Articles. Salvage timber cuts which may be necessary due to natural catastrophe will be allowed in both Primary and Buffer Areas, but in a manner that will contribute to the recovery of the prevailing natural conditions of the forest and in consultation with the North Carolina Natural Heritage Program.

Several preexisting disturbances extend into the Primary Area. These include a gravel parking lot located east of Lone Mountain on the north side of the Broad River (see Exhibit A, Lone Mountain Section for locations) and wildlife fields. Based on recommendations from the pertinent funding source, Clean Water Management Trust Fund, these disturbances will be managed as follows. The parking lot may be maintained, but not expanded. Portions of the fields which are within 35-feet from the top of streambank must be allowed to regenerate and may not be mowed. Mowed areas over 35 feet from the top of streambank and within the Primary Area may be maintained as part of the Buffer Area.

The Primary Areas defined along streams within the Lone Mountain section that extend for 300 feet from each edge of the stream are the areas that were protected through restrictions imposed by the Ecosystem Enhancement Program entitled "Memorandum of Agreement: Lone Mountain Tract, South Mountains Game Lands".

Two special management areas exist within the primary area. These contain heavily altered habitat where rare species populations persist because they are adapted to open or partially forested conditions. These areas are on the south-facing slopes of Shoal Mountain and the area east of Devils Fork Mountain (see Exhibit A, Overview Map). Each area contains populations of the white irisette (*Sisyrinchium dichotomum*), a federally listed species. The focal management goal within these two special management areas will be to restore and enhance suitable habitat for the white irisette. Existing populations of the white irisette will not be directly or indirectly impacted by management activities. A secondary function of this managed area will be to provide for wildlife species with the same habitat needs as the white irisette. Consultation with the Natural Heritage Program and with other agencies monitoring federally listed species will occur as part of the management planning process.

E. Wild Fire Control/Prescribed Burning: Wild fires may mimic natural processes historically occurring in an ecosystem on a landscape level. When the extent of a wild fire does not threaten human life or structures, it may be allowed to burn with minimal control. If wild fire control is necessary, firebreaks may need to be established. When possible, existing roads and firebreaks will be utilized for wild fire control. When new firebreaks need to be established, environmentally sensitive areas will be avoided when possible. Old firebreaks which affect the natural hydrology of wetlands will be filled and allowed to revegetate. Planning of firebreak restoration should occur in consultation with the North Carolina Natural Heritage Program.

F. Water Control: The purpose of water control shall be to maintain the preserve's natural water regime. Water levels that have been altered by man may be changed if necessary to restore the preserve to its natural condition. In a preserve with a long history of managed hydrology, water levels may be managed to perpetuate the ecosystems that have evolved around the hydrology or may be restored to natural condition. This decision should be made in consultation with the Natural Heritage

Program. Millponds are an example of situations in which water levels have been historically managed.

G. Pollution and Dumping: There will be no storage or dumping of ashes, trash, garbage, hazardous substances, toxic waste, other unsightly or offensive material, or fill material, including dredge spoil in, on, or under the preserve. No underground storage tanks may be placed within the preserve. No surface or ground waters of the preserve may have pollutants added within the preserve.

H. Control of Vegetational Succession: Control of vegetational succession may be undertaken if necessary to maintain or restore a particular natural ecosystem type or to preserve endangered, threatened, rare, or other unusual species. Controls will be done in the manner that best imitates the natural forces believed responsible for maintaining the natural ecosystem type, or that minimizes unnatural effects on non-target portions of the ecosystem. Prescribed burning is particularly essential to ecosystems where natural wild fire historically suppressed woody vegetation and promoted herbaceous diversity.

I. Control of Populations: Any control of animal or plant populations on the preserve shall be for the purpose of correcting those situations where those populations are significantly affecting natural conditions on the preserve, and in accordance with the Custodian's established regulations for hunting, trapping, or fishing of designated game animals. The Custodian may, in consultation with the North Carolina Natural Heritage Program, apply biological controls, herbicides and pesticides, and other means deemed necessary or appropriate to control or eradicate exotic or native species of plant or animal that are degrading the natural character of the preserve. Because of potential impacts on native species, no exotic flora or fauna shall be introduced into the preserve.

J. Research and Collecting Permits: Any person wishing to engage in scientific research requiring collecting or otherwise affecting anything within the preserve shall first secure written permission from the Custodian.

K. Roads and Trails: New roads shall not be constructed in the Primary Area. When necessary, the Custodian may construct and maintain access limited to staff use for management purposes, such as service paths (single lane vegetated paths) for patrol, right-of-way maintenance, and other management activities, within the Primary Area. Number and width of new paths will be minimized, and sensitive areas avoided when possible. Existing roads that occur within or form a boundary of the Primary Area may be maintained by grading of the roadbed, replacing culverts, or adding stone as needed in order to maintain the integrity of the road for vehicular use. Daylighting of roads within the Primary Area should be minimized, but may be used if necessary to maintain the condition of the road.

The Woods Gap Road and Black Mountain Road (see Exhibit A, overview map) and the Petty Gap-County Line Road (see Exhibit A, overview map and Lone Mountain map) may be maintained and/or improved to accommodate limited vehicular traffic and parking. Construction of a small parking area and heliport adjacent to the specified section of Black Mountain Road and adjacent to the specified section of Petty Gap-County Line Road is allowed (see mapped location in Exhibit A, overview map). Maintenance of trails and other access structures will be limited to the level necessary to appropriately manage the preserve. Access management and construction will be part of the overall management planning process and will include consultation with the North Carolina Natural Heritage Program.

L. Other Structures and Improvements: Structures or facilities shall not be erected by the Custodian within a preserve, except as may be consistent with the purposes of the preserve as stated in this dedication. Site selection shall be consistent with this dedication.

M. Management Plan: The Wildlife Resources Commission, as Primary Custodian of the preserve, shall be required to prepare and submit for approval to the Secretary of the Department of Environment and Natural Resources a management plan for the preserve. The management plan will be part of the larger management plan developed for the gamelands. This plan shall be subject to all the provisions of this dedication and shall additionally be consistent with the management principles set forth in the North Carolina Administrative Code 15 NCAC 12H.0300 and such other regulations as may be established from time to time by the Secretary of the Department of Environment and Natural Resources. In any case where contradictions may arise between this instrument of dedication and other management regulations, the terms of this dedication shall take precedence.

7. **Rules for Management of the Buffer Area(s)**: Primary area rules also apply except that additional forestry and wildlife management activities may be planned and carried out as needed. Construction and maintenance of roads, trails, and other access structures within buffer area(s) of the preserve will be limited to the level necessary to appropriately manage the preserve. These activities will be conducted in accordance with policy of the N.C. Wildlife Resources Commission and general management philosophy as outlined in Commission planning documents, in addition to providing for the buffer functions in relation to the primary area(s). WRC rules and guidelines require the protection and enhancement of wildlife populations and habitat so that hunting, fishing, trapping and other wildlife recreational opportunities are available to citizens of this State. Forest management is primarily conducted to enhance wildlife habitat.

Buffer functions within the dedicated area may include protecting the primary area(s) from indirect detrimental ecological effects, providing additional area for species and ecological processes that require larger areas, and providing important successional stages and

disturbance regimes and other habitat diversity for wildlife. Based on these general objectives, the following buffer functions will be addressed in the management plan.

1) Landscape level function of community type and structure. (Buffer area management may involve timber harvest and other forms of stand manipulation, but will not involve forest canopy type conversion over more than limited areas, other than to restore stands to types suited for the site. Introduction of exotic species known to be invasive in natural communities will be avoided.)
2) Maintenance of habitat connectivity and continuity among primary areas.
3) Providing for habitat diversity.
4) Management needs of rare animal and plant species populations occurring within the buffer area; and
5) Protection of soil and hydrologic resources and processes within the primary area and extending into the buffer. (Buffers will be retained along streams, and watersheds of primary areas will be protected from hydrologic alteration.)

8. **Amendment and Modification**: The terms and conditions of this dedication may be amended or modified upon agreement of the Wildlife Resources Commission and Secretary of the Department of Environment and Natural Resources, and approved by the Council of State. Any portion of the tract dedicated pursuant to this instrument may be removed from dedication in accordance with the provisions of North Carolina General Statutes 113A-164.8.

9. **Permanent Plaque**: The Custodian should erect and maintain a permanent plaque or other appropriate marker at a prominent location within the preserve bearing the following statement: "This Area is Dedicated as a State Nature Preserve."

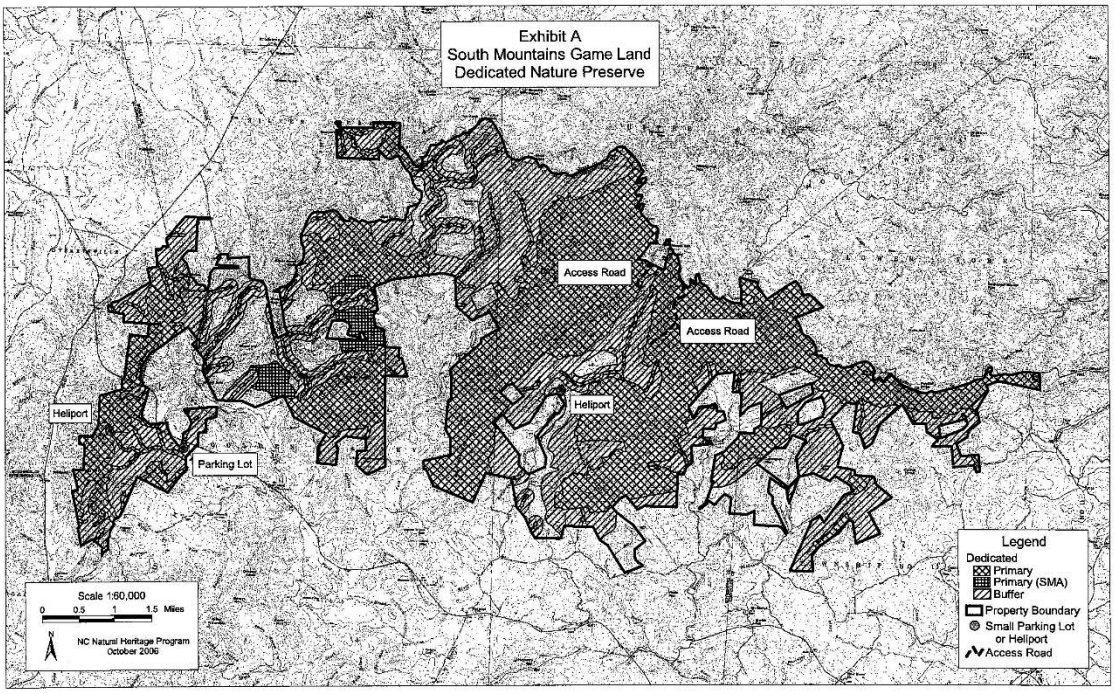


Exhibit A
South Mountains Game Land
Dedicated Nature Preserve
Access Road
Access Road
Heliport
Heliport
Parking Lot
Scale 1:60,000
0 0.5 1 1.5 Miles
NC Natural Heritage Program
October 2006
Legend
Dedicated
Primary
Primary (SMA)
Buffer
Property Boundary
Small Parking Lot or Heliport
Access Road

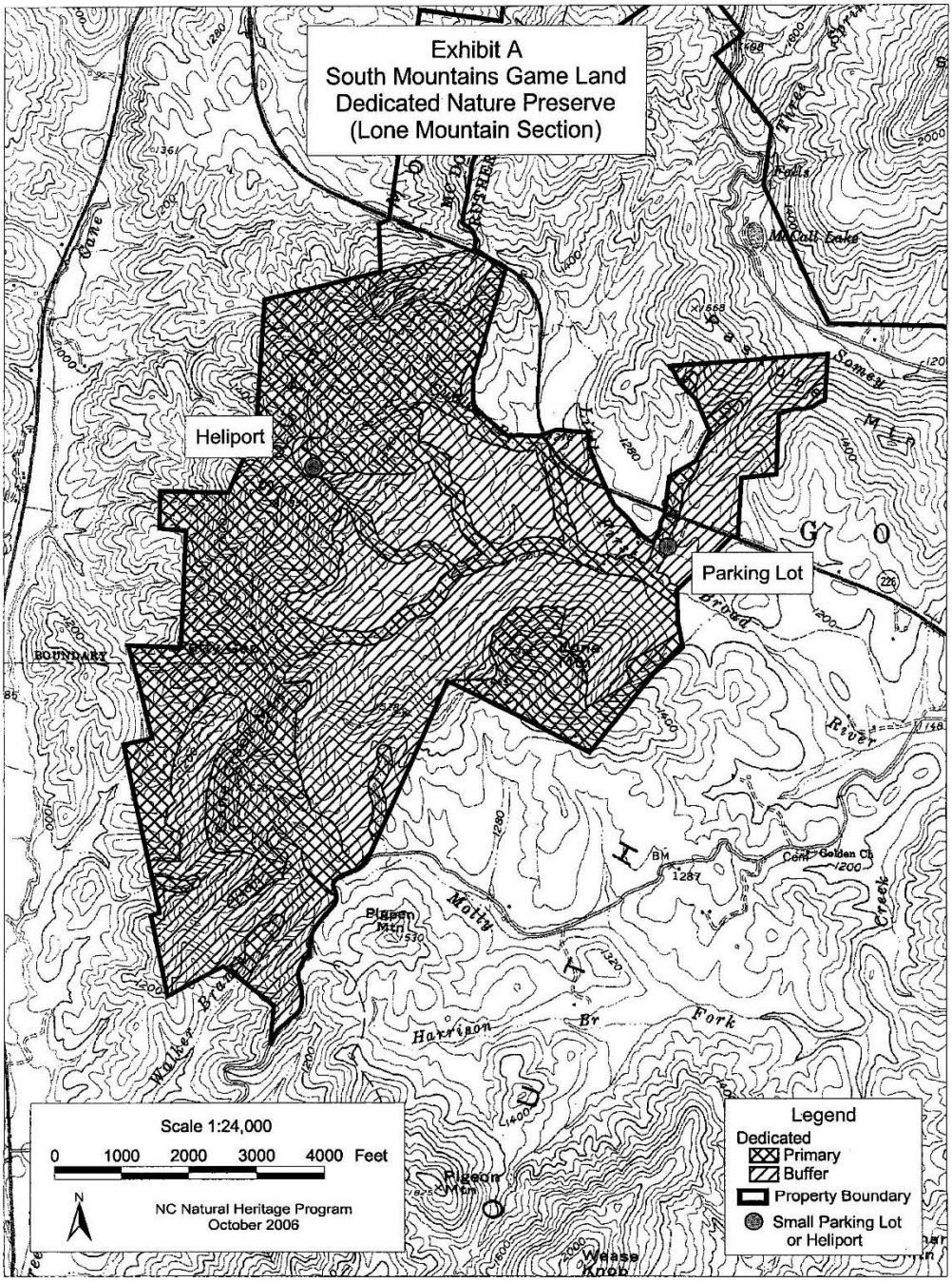


Exhibit A
South Mountains Game Land
Dedicated Nature Preserve
(Lone Mountain Section)
Heliport
Parking Lot
BOUNDARY
Scale 1:24,000
0 1000 2000 3000 4000 Feet
N
NC Natural Heritage Program
October 2006
Legend
Dedicated
Primary
Buffer
Property Boundary
Small Parking Lot or Heliport

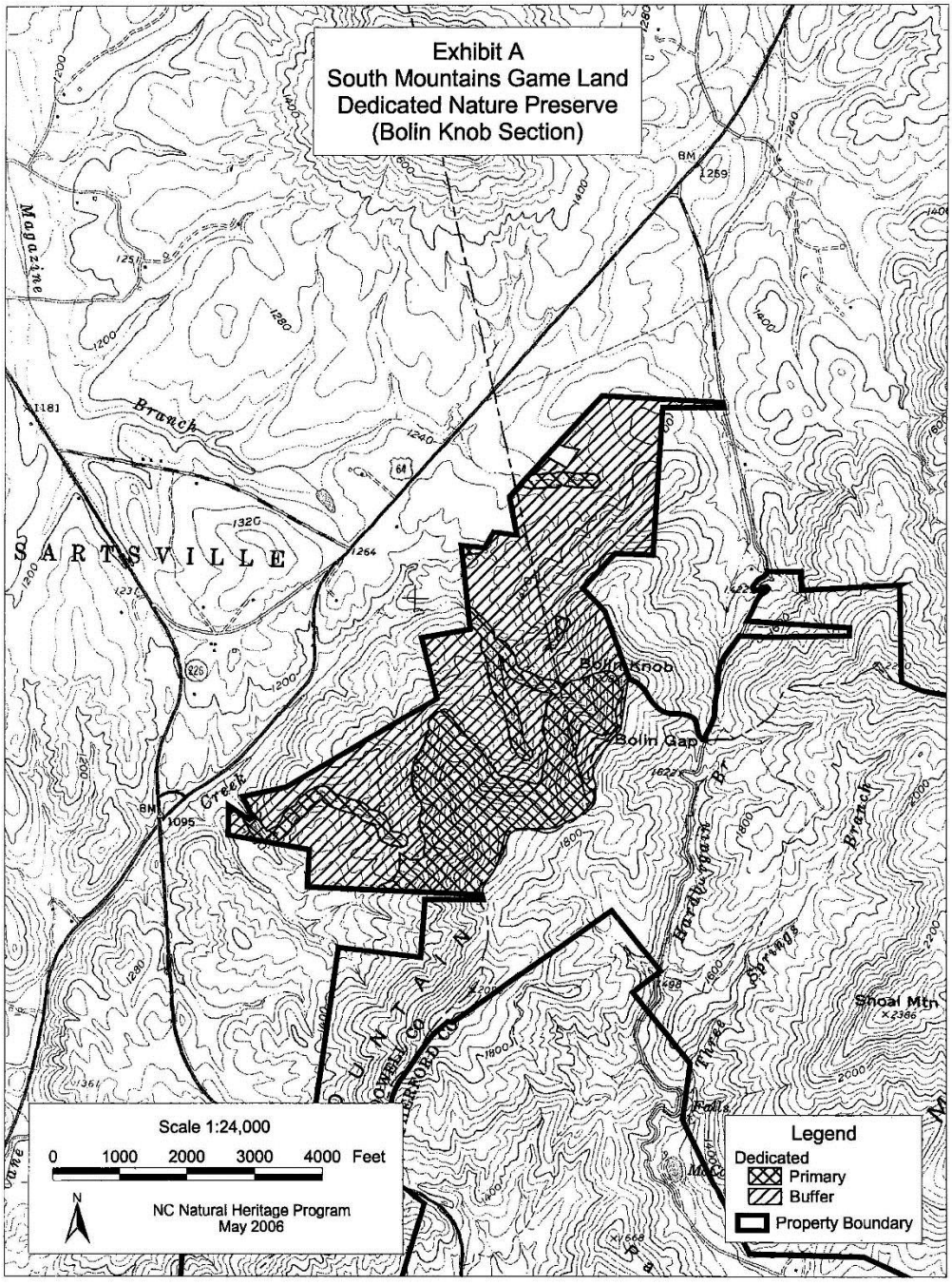


Exhibit A
South Mountains Game Land
Dedicated Nature Preserve
(Bolin Knob Section)
Bolin Knob
Bolin Gap
Shoal Mtn
SARTSVILLE
Scale 1:24,000
0 1000 2000 3000 4000 Feet
N
NC Natural Heritage Program
May 2006
Legend
Dedicated
Primary
Buffer
Property Boundary

APPENDIX 4 – GAME LANDS USE EVALUATION PROCEDURE

North Carolina Wildlife Resources Commission
Game Lands Use Evaluation Procedure

I. PURPOSE

The North Carolina Wildlife Resources Commission (NCWRC) is the principal advocate for and steward of the wildlife resources of North Carolina and is the primary custodian of numerous tracts of state-owned lands in the Game Lands Program. As the human population of North Carolina continues to grow at a rapid rate, state-owned Game Lands will be subject to increasing pressure to provide public outdoor recreation opportunities. These uses will include traditional activities such as hunting, fishing, trapping, and wildlife viewing, as well as other outdoor recreation pursuits. While hunting, fishing, trapping and wildlife viewing are the primary public uses of state-owned Game Lands, the NCWRC has always allowed and supported other dispersed and non-developed recreational activities. The funding sources of the NCWRC, however, are focused on natural resources management rather than recreational development and there is no on-site staff stationed at each Game Land. Because of this, the NCWRC must exercise care in providing for recreational activities that may not be compatible with the natural resources for which the lands are valued and the primary management objectives of those lands. This document will establish a process to evaluate such activities as they are considered by NCWRC staff, or are requested by the public, on state-owned Game Lands where NCWRC is the primary custodian. These activities will first be evaluated to determine if they are "appropriate" and second to determine whether they are "compatible" with respect to the following management objectives of the Game Lands program:

1. To provide, protect, and actively manage habitats and habitat conditions to benefit aquatic and terrestrial wildlife resources,
2. To provide public opportunities for hunting, fishing, trapping, and wildlife viewing,
3. To provide for other resource-based game land uses to the extent that such uses are compatible with the conservation of natural resources and can be employed without displacing primary users,
4. To provide an optimally sustainable yield of forest products where feasible and appropriate and as directed by wildlife management objectives.

This document provides a statewide framework for determining appropriate uses of NCWRC-owned or controlled Game Land properties (NCWRC Game Lands). In addition, it provides the procedure for determining if appropriate uses are compatible on a particular property.

II. ENABLING LEGISLATION

Statement of Purpose NCGS § 143-239. The purpose of this article is to create a separate State agency to be known as the North Carolina Wildlife Resources Commission, the function, purpose, and duty of which shall be to manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State of North Carolina, and to administer the laws relating to game, game and freshwater fishes, and other wildlife enacted by the General Assembly to the end that there may be provided a sound, constructive, comprehensive, continuing, and economical game, game fish, and wildlife program directed by qualified, competent, and representative citizens, who shall have knowledge of or training

in the protection, restoration, proper use and management of wildlife resources. (1947, c. 263, s. 3; 1965, c. 957, s. 13)

III. APPLICATION OF PROCEDURE

This procedure must be considered within the context of the Game Lands Program Mission Statement (GLPMS):

> "Consistent with the original establishment legislation for the WRC, the mission of the game lands program is to enhance, facilitate, and augment delivery of comprehensive and sound wildlife conservation programs. Inherent in delivery of a lands program consistent with this mission is the feasibility and desirability of multiple uses on lands owned by the state within the system. In addition to hunting, fishing, trapping, and wildlife viewing as primary uses, we recognize the desirability of providing opportunities for other activities on state-owned game lands that are feasible and consistent with the agency's mission, and compatible with these traditional uses." (*From motion made December 5, 2007 by Doug Parsons, Chairman, WRC Use and Lands Committee and unanimously approved).*

This procedure applies to all proposed and existing recreational uses of NCWRC Game Lands. It does not apply to the following circumstances:

A. **Situations where reserved rights or legal mandates provide that certain uses must, or must not, be allowed**. For example, there may be prescriptive purposes or other uses that are specifically required or not allowed in the deed or grant that conveyed the property to the state.

B. **Property management activities**. Property management activities are specified in Federal Assistance Work Plans for lands NCWRC purchases or manages with federal assistance, and are updated every five years. These plans specify wildlife, fish, and forest management activities that are not subject to this procedure when conducted by NCWRC staff or an approved cooperator.

C. **Emergencies**. The Director (or a designee) may temporarily suspend, allow or initiate any use of a property if it is determined necessary to immediately act in order to protect the health and safety of the public or any plant, fish or wildlife population.

D. **Specialized uses**. There are many uses (most of them non-recreational) that require specific authorization from NCWRC in the form of a special use permit, letter of authorization or other permit document. Some of the specialized uses that may be considered include scientific research or collections, educational pursuits, field trial use, use of buildings or other facilities, rights-of-way and other encroachments, telecommunications facilities, military, national defense uses, and public safety training. Requests for specialized uses are covered by other NCWRC policies, procedures, or rule, and are subject to separate review procedures. (*See NC Administrative Code, Title 15A, Chapter 10, Subchapter 10D - Game Land Regulations, Rule .0102; General Statutes 113-264*).

E. **Other NCWRC properties.** The NCWRC owns and/or manages lands outside of the Game Land program (e.g., boat ramps and Wildlife Conservation Areas). The use and

management of those properties are covered by other NCWRC policies, procedures, or rule and are subject to separate review procedures. (*See NC Administrative Code, Title 15A Chapter 10, Subchapter 10E - Fishing and Boating Access Areas, Rule .0104; NC Administrative Code, Title 15A Chapter 10, Subchapter 10J - Wildlife Conservation Area Regulations, Rule .0102; General Statues 113-264*).

If a proposed use falls under one of the above five circumstances, it is exempt from review under this procedure. Any other Game Land use requests, whether originating from the public or from NCWRC staff, must be reviewed under this procedure and with consideration of the following guidance:

- **Natural resources-dependent recreational uses** (see definitions below), when compatible with each other, should be considered the priority general public uses of Game Land properties.
- **Other general public uses** that are not natural resources-dependent recreational uses as described herein, and do not contribute to the fulfillment of property purposes or goals or objectives, as described in the GLPMS, are lower priorities for consideration. These uses may conflict with priority general public uses, and may divert property management resources away from priority general public uses or from the responsibility of the NCWRC to protect and manage fish, wildlife, plants and their habitats. Therefore, procedure and practice have a general presumption against allowing such uses on Game Land properties. Regardless of how often they occur or how long they last, appropriateness and compatibility determinations for each use request must be made, as defined in Section V and VI of this procedure.

IV. DEFINITIONS

A. **Natural resources-dependent recreational use** is a use of a property involving: (1) hunting; (2) fishing; (3) trapping; (4) wildlife or other natural resource observation/ education.

B. **Property managers** are the officials employed by NCWRC who direct the management of a property, or the authorized representatives of such officials.

C. **Professional judgment** is a finding, determination or decision that is consistent with the principles of fish and wildlife management and administration, and that makes use of all available science and resources.

V. DETERMINING APPROPRIATE USE

A property use is appropriate if it meets Criterion A ***or*** if it meets all of Criteria B – F (and G, when applicable).

A. It is a natural resources-dependent recreational use of a property. These are: (1) hunting; (2) fishing; (3) trapping; (4) wildlife or other natural resource observation/education.

B. The NCWRC has jurisdiction over the use and, therefore, authority to allow or not allow the use.

C. The use complies with all laws and regulations (federal, state and local).

D. The use is consistent with NCWRC policies and objectives.

E. The use is consistent with public safety. *If the use creates an unreasonable level of risk to visitors or NCWRC staff, or if the use requires NCWRC staff to take unusual safety precautions to assure the safety of the public or other NCWRC staff, the use is not appropriate.*

F. Proceeds of revenue generating uses, by for-profit entities, will be provided to the NCWRC.

G. The use was evaluated under previous administrative review, was deemed inappropriate, and conditions have changed that would now make the use appropriate.

Property managers and other NCWRC staff shall consider the above criteria and complete Exhibit 1 (appended to this document) for each use subjected to the appropriateness test. The findings shall be forwarded to Regional Supervisors and through the chain of supervision to the Director (or a designee) for concurrence. This will serve to promote consistency in determining appropriate uses of NCWRC Game Lands.

VI. DETERMINING COMPATIBILITY

Uses that are determined to be appropriate for Game Land properties will then be evaluated for compatibility to determine if the use will be allowed, and under what conditions the use will be allowed on a specified property. Property managers are required to exercise professional judgment in making these determinations. Compatibility determinations are inherently complex and require the property manager to use field experience and knowledge of land management and of the property's resources, particularly its biological resources. When a property manager is exercising professional judgment, the property manager will use available information that may include consulting with others inside and/or outside the NCWRC. At a minimum, the property manager should consider the following questions.

A. Can the use be accommodated without substantially interfering with or detracting from the fulfillment of Game Lands program management objectives (see page 1, section I)?

B. Is the use compatible with the physical and natural resource characteristics of the property (e.g., topography, soils, plant communities, endangered species concerns)? *The use is generally incompatible if it has a high probability of causing erosion, or sedimentation, or disturbance of plant or animal resources.*

C. Is the use compatible with Natural Heritage Articles of Dedication, Clean Water Management Trust Fund (CWMTF) designations, and/or any deed restrictions or other legal limitations placed upon the property, including those specified for land purchased with Pittman-Robertson Wildlife Restoration Act funds?

D. Is there infrastructure present on the property to support the requested use (e.g., graveled

roads, parking areas, facilities)?

E. Is the requested activity not adequately provided for on other nearby public lands? *If a proposed use is available on other nearby lands, the NCWRC may not feel as strong an obligation to consider that use on Game Lands. Even if a use is <u>not</u> adequately provided for on other nearby public lands, the NCWRC still may not feel such an obligation, but should consider the unique nature of the request.*

F. Will the use necessitate facility, infrastructure development or maintenance and is this use manageable within available budget and staff? *If a proposed use diverts management efforts away from the proper and reasonable management of a property or natural resources-dependent recreational use, the use is generally incompatible.*

G. Will the use be manageable in the future within existing resources? *If the use would lead to recurring requests for the same or similar activities that will be difficult to manage in the future, then the use is generally incompatible. If the use can be managed so that impacts to natural and cultural resources are minimal or inconsequential, or if clearly defined limits can be established, then the use may be compatible.*

H. Is the requesting entity capable of providing any funding, labor, or materials for the development of, and maintenance support for, the activity, if applicable (e.g., trail or road maintenance, rehabilitation to areas that may be damaged by the activity)?

I. If a use is not compatible as initially proposed, can it be made compatible by implementing stipulations that avoid or minimize potential adverse impacts?

Property managers shall consider the above questions, and any other information or issues deemed necessary to make a determination based on professional judgment, and complete Exhibit 2 (appended to this document) for each property use subjected to a compatibility determination. The findings shall be forwarded to the Regional Supervisor and through the chain of supervision to the Director (or a designee) for concurrence. This will serve to promote consistency in determining compatible uses of NCWRC Game Lands.

VII. <u>EVALUATION</u>

The Director (or a designee) shall consider each request and the derived appropriateness and compatibility, and then make a determination as to whether the request will be approved or denied. The Director will forward use requests deemed significant in scope to the Commission's Use and Lands Committee, such as those involving: a) rule change, b) revenue generation, c) expenditure of NCWRC funds, or d) substantial alteration to infrastructure or natural resources.

All approved uses will be evaluated periodically by NCWRC field staff to determine whether such activities remain appropriate and compatible. All efforts will be made by field staff to inform participants of approved uses that issues of incompatibility will be grounds for immediate termination of the approved activity.

This is a living document that may be modified and updated as needed.

EXHIBIT 1

APPROPRIATE USE DETERMINATION

Property Name: _____

Requested or Considered Use: _____

DECISION CRITERIA *(refer to section V)*	YES	NO
A. Is the use a natural resource-dependent recreational use of a property?		
If 'NO' above, then consider the following criteria.		
B. Does the NCWRC have jurisdiction over the use?		
C. Does the use comply with laws and regulations (federal, state or local)?		
D. Is the use consistent with NCWRC policies and objectives?		
E. Is the use consistent with public safety?		
F(i). Is the requesting entity a non-profit? F(ii). If NO to F(i), will any proceeds of the use be provided to the NCWRC? (*Describe for-profit entity and supply information on proceeds to be provided to the NCWRC in the Comments section below*)		
G. If the use was evaluated under previous administrative review and deemed inappropriate, have circumstances changed that would now make the use appropriate? (*leave blank if not applicable*)		

To be found appropriate, answers to Criterion A **OR** Criteria B – F (and G, if applicable) must be YES.

Determination (check one below):

_____ Appropriate _____ Not Appropriate

Comments:

Property Manager: _____ Date: _____

Regional Supervisor: _____ Date: _____

EXHIBIT 2

COMPATIBILITY DETERMINATION

(*Use as much space as needed*)

Property Name: _____

Requested or Considered Use: _____

DECISION CRITERIA *(refer to section VI)*	YES	NO	Comments
A. Use will not interfere with or detract from fulfillment of Game Land program management objectives?			
B. Use is compatible with the physical and natural resource characteristics of the property?			
C. Use is compatible with Natural Heritage Articles of Dedication, CWMTF designations, and/or any deed restrictions or other legal limitations placed upon the property? **OR** (in the absence of the above) do acquisition funding partners otherwise agree to the proposed use?			
D. Infrastructure is present on the property to support the requested use?			
E. Requested activity is not adequately provided for on other nearby public lands?			
F. Use is manageable within available budget & staff?			
G. Will the use be manageable in the future within existing resources?			
H. Is the requesting entity capable of providing any maintenance support for the activity, if applicable?			
I. If the use is not compatible as initially proposed, can it be modified with stipulations that avoid or minimize potential adverse impacts and make the use compatible?			
Other (*insert*):			

To be found compatible, answers to ALL of the above questions must be YES.

Determination (Check one below):

_____ Compatible _____ Not Compatible

Stipulations necessary to ensure compatibility (*e.g., Memorandum of Agreement; performance bond; time, space, or size limitations*):

Justification/Comments:

Property Manager: _____ Date: _____

Regional Supervisor: _____ Date: _____

APPENDIX 5 – SUMMARY OF PUBLIC INPUT

Seven questions were presented to the public for their input at a meeting held in Morganton on 8/25/14. The public was also given the opportunity to provide input to the same questions via the agency website. A summary of input received is below.

1. Which habitats are most important to protect on JRGL?

Habitat	**Responses**
Food Plots/Open Areas	11
Waterfowl Habitat	8
Oaks	7
Riparian Hardwood Stands	5
Wetlands	5
Deer Habitat	4
Dove Fields	2
Turkey Habitat	3
Small Game Habitat	2
Aquatic	2
Early Successional	2
Grouse Habitat	1
Riparian Areas	1
Musky Habitat	1
Fruit Trees	1
Mature Forest	1

2. Considering those that live on land and in water, what species do you think are most important to protect and/or improve on JRGL?

Species	**Responses**
Turkey	15
Deer	14
Waterfowl	13
Small Game	7
Dove	5
Songbirds	3
All Species	2
Amphibians	2
Musky	2
Northern bobwhite	2
Aquatic Invertebrates	1
Bear	1
Big Game	1
Endangered Plants	1
Fish	1
Lady's Slippers	1
Owls	1
Rabbit	1

3. How do you use JRGL?

Use	Responses
Hunting	26
Fishing	6
Do not use	4
Hiking	3
Biking	1
Boating access	1
Canoeing	1
Hike in search of grouse	1
Photography	1
Walking	1

4. Please explain why you think the current level of access is, or is not, satisfactory on JRGL?

Approximately 90% of those that responded to the question indicated that the access level currently provided is adequate. Portions of the game land will continued to be managed to allow easy vehicular access while other areas will be maintained for “walk in” access only.

A summary of public input and responses to those that suggested specific access improvements is below.

Comment	Response
Provide disabled access for waterfowl hunts	Most of the waterfowl habitat on JRGL is located along streams. Providing vehicular/disabled access to these areas would prove difficult while still protecting the integrity of the riparian areas/waterfowl habitat and honoring the CWMTF riparian buffers.
The Lower Creek Unit could be made more accessible to disabled hunters	NCWRC will look for opportunities to provide more disabled access on this unit.

Open up the Loop Rd. Unit for hunters that aren't classified as disabled but still are mobility challenged	Administering this type service would be very difficult. There is a procedure in place for those that are mobility challenged to participate in disabled hunts by certification through their physician.
Make the Loop Road Unit gate easier to open for disabled hunters	An opening has been cut in the gate bell to provide light and improve the lock angle, making the lock easier to open. NCWRC will continue to explore ways to make this gate easier to open while still providing protection to the tract from illegal vehicular activity and minimizing vehicular disturbance to hunters that are using the tract.
Limit hiking during hunts	There is no way for law enforcement to discern between hikers and those scouting for current or future hunts. Public comments not were received indicating that conflicts between hunters and hikers were occurring at a significant level. NCWRC will post signs at parking areas warning hikers when hunting season is in.
The game land boundary should be marked more clearly	The game land boundary is painted with orange paint no less than every 7 years. Online maps of the game land are available that show the general location of the game land boundary.

5. What suggestions, if any, do you have for changing how JRGL is managed and maintained?

A summary of public input and responses is below.

Comment	**Response**
Require game land use permit for all users	This requirement should be explored at the statewide level.
Allow ATV access for retrieving game	Allowing this activity can cause unintended resource degradation and create unwanted disturbance to other hunters. There is also no practical way to provide this privilege or ensure that it is not abused.
Allow easy access for elderly to drive to prime hunting areas	Vehicular access to many areas on the game land currently exists. Additionally, there is a procedure in place for those that are mobility challenged to participate in disabled hunts through certification by their physician.
Provide permanent stands for the elderly on the Lower Creek Unit	This sort of program would be difficult to administer, given that the Lower Creek Unit is managed for all hunters. The Loop Road Unit is currently managed to provide a high level of access and opportunity to those that are disabled/mobility challenged.
Decrease pine stands on the game land	JRGL was managed as an industrial forest before acquisition by NCWRC. NCWRC plans to restore planted pines to hardwoods or mixed pine/hardwoods over time.
Develop more wildlife openings on JRGL	NCWRC has developed many openings on JRGL since the property was acquired and will continue to develop more openings as opportunities, funding, and manpower allows.
Dove fields should not be burned before the season	Prescribed fire is a standard technique used by wildlife managers to prepare certain crops for dove hunting. This technique provides the bare ground preferred by doves for feeding.
Implement predator control	Predator control is not feasible at the landscape level due to manpower limitations and regulations.
Let hunters know when prescribed burns will occur	NCWRC issues press releases before prescribed burns. Adjoining landowners are always directly notified by NCWRC when prescribed burns are going to take place.

Increase quotas on permit hunts	Quotas are set to ensure that the resource is not overharvested and to provide a quality hunt with minimal conflicts among hunters. Comments received indicate that most hunters are satisfied with the current hunt quotas.
Change to 6 day/week game land	There are several large population centers in close proximity to the game land, the game land has excellent access in all areas, and the permit only regulation allows NCWRC to provide high quality hunts with minimal conflicts among hunters. Maintaining current wildlife population levels and providing high quality hunt opportunities would not be possible under 6 day/week management. Little interest in changing to 6 day/week was received via public input.
Keep the permit system in place	Several comments were received in favor of continuing to manage JRGL as a permit only game land. There are no plans to change this management strategy. There are several large population centers in close proximity to the game land, the game land has excellent access in all areas, and the permit only regulation allows NCWRC to provide high quality hunts with minimal conflicts among hunters.
Provide more youth hunts on JRGL	Youth hunts are provided on JRGL for deer, turkey, and waterfowl. Archery youth hunts were offered at one time, but participation was very low. NCWRC strives to provide a balance of youth, disabled, and general hunts on JRGL.
JRGL should be archery only so anyone can hunt it anytime.	The mission of NCWRC is to provide opportunities for all sportsmen on game lands where feasible and safe to do so. Archery only hunts are currently provided on JRGL. Archery only areas are established where the discharge of a gun would create safety issues or at the request of the landowner on leased game lands.
Many of the old logging roads and access roads could be better planted with food plots.	Access roads and logging roads serve as administrative access and firebreaks.

Implement antler restrictions	Plantings do occur on road areas that are wide enough and conducive to planting. Very little interest was received for implementing antler restrictions. Hunt quotas are set to ensure that deer are not overharvested and to provide a quality hunt for participants.
Install more informational signs	4 informational kiosks have been installed on JRGL. Informational signs are installed at each gate on JRGL.
Construct waterfowl impoundments and/or provide additional waterfowl habitat on JRGL	NCWRC explored the possibility of constructing waterfowl impoundments on the Loop Rd. Unit when the property was acquired. Extensive testing by NCWRC staff, Ducks Unlimited staff, and the Natural Resources Conservation Service indicated that the soil would not hold water without extensive and cost prohibitive measures. Additionally, the Loop Rd. Unit floods routinely and any habitat modifications/improvements would have to withstand repeated flooding. NCWRC will to provide waterfowl habitat where feasible on JRGL.
Provide a waterfowl hunt on the swamp on the Loop Rd. Unit that borders NC Hwy 18.	This swamp is not part of JRGL and is owned by Duke Energy. Inquiry was made reference acquisition or leasing this property. This effort was not successful.

6. What would encourage you to start using JRGL, or to continue using it more actively?

A summary of public input and responses is below.

Comment	**Response**
Provide more access to the game land	See Question 4 above for response
Develop more wildlife food plots	See Question 5 above for response

Improve Northern bobwhite habitat and initiate a CURE program on JRGL	NCWRC will provide early successional habitat (ESH) and habitat diversity via forestry and other habitat management techniques on JRGL as directed by this management plan. Unless quality ESH is provided across an extensive landscape (beyond game land boundaries) Northern bobwhite response will be low.
Provide more dove fields on JRGL	NCWRC annually prepares an 18 acre dove field on JRGL. NCWRC will provide additional dove fields on JRGL as opportunity, funding, and manpower allows.
Increase quotas on permit hunts	See Question 5 above for response
Keep the permit system in place	See Question 5 above for response
Provide interpretive educational programs on JRGL	Educational programs are provided at NCWRC educational centers. This type service cannot be provided on JRGL since staff is not directly located on the game land. Additionally, manpower limitations at the local level prohibit this service.
2 non hunters should be able to accompany disabled hunters.	This suggestion will need interpretation/resolution at the Statewide level.
Allow permit holders to transfer permit to someone else if they can't hunt.	A regulation change at the Statewide level would have to be implemented to accommodate this request.
Provide waterfowl impoundments and/or more waterfowl habitat	See Question 5 above for response

7. What additional comments do you have about JRGL?

Comment	**Response**
Install “mock” power lines on dove fields	NCWRC will investigate the feasibility of doing this.
Offer maps free or for sale	Maps of all game lands are available for download at no charge at www.ncwildlife.org

Initiate preference point system for permit hunts	The feasibility for providing a preference point system for permit hunts would have to be investigated at the Statewide level
Be more explicit about the taking of coyotes during permit hunts	All hunting permits for JRGL indicate that coyotes can be taken during hunts

1. Which habitats are most important to protect on SMGL?

Habitat	**Responses**
Early successional habitat	16
Food plots	8
Hardwoods	4
Small game	4
All of them	3
Big game	3
Aquatic	2

2. Considering those that live on land and in water, what species do you think are most important to protect and/or improve on SMGL?

Species	**Responses**
Deer	13
Turkey	12
Northern bobwhite	7
Grouse	5
Bear	5
Dove	5
Songbirds	3
Small game	3
Trout	3
All species	2
Frogs	1
T/E species	1
Amphibians	1
Beneficial insects	1
Owls	1

3. How do you use SMGL?

Activity	Responses
Hunting	29
Hiking	10
Do not use	3
Biking	2
Fishing	2
Photography	2
Birding	1
Horseback Riding	1

4. Please explain why you think the current level of access is, or is not, satisfactory on SMGL?

Approximately 60% of those that responded to the question indicated that general access to SMGL is adequate. Portions of the game land will continue to be managed for or will be improved to allow better vehicular access while other areas will be managed for “walk in” access only. A summary of public input and responses to those that suggested specific access improvements is below.

Comment	Response
The boundary between SMGL and South Mountains State Park should be aligned to the upper CCC Rd. where appropriate	This action has been approved and NCWRC and State Parks will realign the boundary.
Access is needed from Brier Creek Road	The State does not own property or hold any ROW easements that allow public access from Brier Creek Rd. NCWRC will attempt to acquire any properties that become available in this area that would provide access.
Additional roads suited for vehicular use are needed	Additional roads, seasonally open to public vehicular use will be provided where feasible and as detailed in the Infrastructure portion of the management plan
Access is confusing and needs to be better marked	NCWRC plans to provide better signage directing game land users to parking areas and access roads

More parking areas are needed	Additional parking areas will be provided as additional properties are acquired. Current parking areas will be improved or maintained as outlined in the Infrastructure portion of the management plan.
Allow horseback riding year round, outside of hunting seasons	Horseback riding is currently allowed on designated trails May 15 – August 31. Except for March this is the time frame outside of hunting seasons. Year round horseback riding opportunities are found on the adjacent South Mountains State Park and nearby Pisgah National Forest.

5. What suggestions, if any, do you have for changing how SMGL is managed and maintained?

A summary of public input and responses is below.

Comment	**Response**
Require game land use permit for all users	This requirement should be explored at the statewide level.
Provide better access to trout streams	Pots Branch and Sally-Queen Creeks both contain wild trout populations. Reasonable access to Pots Branch is provided from a parking area at the end of the Lower CCC Rd. Reasonable access to Sally-Queen Creek can only be provided through additional land acquisition. NCWRC will acquire additional holdings as they become available and as funding allows.
Open the connector road from the end of the Lower CCC road to the Upper CCC road.	NCWRC cannot open this road for public access due to a privately owned inholding that the road traverses. NCWRC will pursue acquisition of this tract if available and as funding sources allow.
Establish primitive camp sites	NCWRC will investigate establishment of 2-3 “backcountry” camp sites on SMGL in remote areas

Add acreage to the CURE area	The CURE area is currently approximately 7,800 acres. Addition to this acreage is not feasible due to the NHP dedication agreement and manpower limitations. NCWRC will continue to provide additional early successional habitat outside of the CURE area where feasible and as directed by the management plan.
Plant American chestnut seedlings	Seedlings will be planted if/when disease resistant stock becomes available
Provide grouse cuts and spruce plantings	SMGL is as the southern periphery of grouse range. Surveys and staff observations indicate that grouse are found only at very low density on the game land. Significant quantities of habitat that is structurally favorable to grouse is present on SMGL, but grouse have not responded to it and grouse are unlikely to respond to additional habitat improvements. SMGL is outside the range/elevation requirement of spruce and plantings would not survive at SMGL.
Develop more wildlife openings on SMGL	NCWRC has developed many openings on SMGL since the property was acquired and will continue to develop more openings as opportunities, funding, and manpower allows.
Provide more early successional habitat (ESH), particularly clearcuts and implement a more robust prescribed burning program	Additional ESH, including clearcuts, will be provided as directed by the management plan. Approximately 1,000 acres are on the annual prescribed burning rotation at SMGL. Any increases are unlikely due to lack of suitable burning days, manpower limitations, and prescribed burning activity on other regional game lands.
Implement more endangered species projects	White irisette is the only endangered species found on SMGL. A significant project to protect and enhance this population has been implemented and is ongoing. Efforts to enhance additional endangered species will be implemented if they are found on the game land.

Only conduct prescribed burns outside of hunting season	Almost all prescribed burning is conducted outside of hunting seasons. Some burns may be conducted during deer archery season due to burn unit objectives and the need to fully utilize the limited number of suitable burning days that occur each year. News releases are issued for all significant burning projects at SMGL to alert the public to this activity.
Plant more fruit trees	NCWRC has engaged in numerous fruit tree planting projects over the years on regional game lands. These have generally been unsuccessful due to damage from disease, insects, small mammals, bear, and deer. Other types of habitat improvement projects have proven more successful and cost effective. As new varieties of fruiting trees and methods of maintaining them become available, NCWRC will continue to explore any possibilities of planting fruiting trees and shrubs.
Implement predator control	Predator control is not feasible at the landscape level due to manpower limitations and regulations. NCWRC will continue to promote trapping on the game land.
Implement antler restrictions	Very little interest was received for implementing antler restrictions. Deer hunting regulations on SMGL are set to ensure that deer are not overharvested and that the herd remains healthy. Hunting is not permitted on the 18,500 ac. South Mountains State Park which lies adjacent SMGL. Natural movement of deer from the State Park to SMGL enhances opportunity for harvesting an older age class buck. Additionally, much of SMGL can only be accessed with significant foot travel. This minimizes hunting pressure on much of the game land and also enhances the opportunity for harvesting an older age class buck.

Establish an archery only area on SMGL	The mission of NCWRC is to provide opportunities for all sportsmen on game lands where feasible and safe to do so. The archery season on SMGL is approximately 8 weeks each year. This should provide ample opportunity for archery only hunting. Archery only areas are established on game lands where the discharge of a gun would create safety issues or at the request of the landowner on leased game lands.
Dove hunting should be by permit only	Little interest in dove hunting by permit only was received. NCWRC will continue to evaluate dove hunter numbers and will submit a regulation change proposal if warranted
Extend the deer season	The deer season is currently approximately 13 weeks annually on SMGL. The deer population on the game land is relatively low. To maintain current deer population levels, any season extension should not result in additional either sex firearms opportunity.
Establish permit only deer and turkey hunts	Minimal interest in permit hunts was received via public comments. SMGL is approximately 21,000 acres. Some portions of the game land receive significant hunting pressure, while other areas receive very little pressure. The size of the game land combined with the current level of hunting pressure does not warrant implementation of permit only hunts for deer and turkey.

6. What would encourage you to start using SMGL, or to continue using it more actively?

A summary of public input and responses is below

Comment	**Response**
The entire game land should be road accessible	It is not feasible to provide road access to all portions of the game land due to manpower and funding limitations as well as the Natural Heritage dedication. Many users of SMGL indicated they prefer foot access to remote areas to minimize conflicts with other hunters and to have opportunity to hunt unpressured game.
Provide better access	See Question 4 and 5 above for responses
Provide primitive camp sites	See Question 5 above for response
Provide picnic areas	Game lands are managed for dispersed and not concentrated recreational activities. NCWRC is not staffed or funded to provide this service.
Allow Northern bobwhite hunting and dog training on the CURE area	Additional expansion of quail is not anticipated on the CURE area due to marginal habitat conditions. Due to access difficulty, mountainous terrain, and low quail density it is unlikely that hunting interest/pressure and harvest would be beyond acceptable levels. NCWRC will submit regulations change proposal.
More small game habitat	ESH will be developed as manpower and opportunities allow and as directed by the management plan
Implement antler restrictions	See Question 5 above for response
Establish permit only deer and turkey hunts	See Question 5 above for response
Establish longer deer season	See Question 5 above for response
Shorten gun deer season and lengthen archery season	See Question 5 above for response
Better trout fishing	SMGL is at the periphery of trout range and opportunities to provide trout fishing are very limited. Also see Question 5 above.

Would like to hunt hogs outside of regular hunting seasons	This would require a regulation change at the statewide level. Additionally, the feral hog population at SMGL has decreased significantly and opportunity for this activity is very limited. This would also create a difficult situation regarding enforcement of other hunting seasons.
Establish a connecting horseback riding trail between both sides of South Mountains State Park	NCWRC has no authority to establish horseback riding trails on South Mountains State Park.
Would like more food plots	See Question 5 above for response
Access should be marked better	See Question 4 above for response

7. What additional comments do you have about SMGL?

Comment	**Response**
Expand the game land through land acquisition	NCWRC will continue to investigate properties as they become available for acquisition. Acquisition of individual properties is dependent on their priority and funding levels
Allow hunting on South Mtns. State Park	Allowing hunting on State Parks would require action by the General Assembly
Keep horseback riders on the schedule they are on now	NCWRC has no plans to change the times that horseback riding is allowed on SMGL. Few comments to provide more horseback riding trails or lengthen the time that horseback riding is allowed were received.