Buffalo Cove, Mitchell River, and Thurmond Chatham 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 Buffalo Cove, Mitchell River, and Thurmond Chatham 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 these game lands to ensure that a comprehensive management program is administered on them. The successful implementation of the plan will depend on the continued feedback and support from all interested parties.

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EXECUTIVE SUMMARY

Buffalo Cove (BCGL; 6,633 acres) is located in Caldwell and Wilkes counties, Mitchell River Game Land (MRGL; 2,306 acres) is located in Alleghany and Surry counties, and Thurmond Chatham Game Land (TCGL; 6,472 acres) is located in Alleghany and Wilkes counties. These game lands are owned by the State of North Carolina and the North Carolina Wildlife Resources Commission (NCWRC) is the primary custodian. Buffalo Cove Game Land was acquired in 2003 and MRGL in 2005. The original purchases for TCGL were made in the early 1950s. Additional tracts have been acquired to enhance all 3 game lands since they were established. These game lands are popular with hunters, fishermen, and wildlife watchers in addition to other outdoor recreational enthusiasts such as hikers. Important game species include deer, wild turkey, bear (BCGL only), and several small game species. Buffalo Cove Game Land is 89% forested, while TCGL is 95% forested. Oak forest is predominant on both of these game lands. Mitchell River Game Land is 78% forested with managed pines most prevalent. Thirteen state endangered, threatened, or rare species are found on these game lands. Management goals for these properties 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 these 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

The previous game land management plan for Thurmond Chatham Game Land (TCGL) was produced in 1996 and therefore, it is out-of-date (N.C. Wildlife Resources Commission 1996). There are no previous game land management plans for either Buffalo Cove Game Land (BCGL) or Mitchell River Game Land (MRGL). A comprehensive game land management plan is needed for these game lands 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 2015). Finally, each of these 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.

This 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 each of these 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

Buffalo Cove, Mitchell River, and Thurmond Chatham Game Lands 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 67,556 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. 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, 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

Buffalo Cove Game Land (6,633 acres), MRGL (2,306 acres), and TCGL (6,472 acres) are located in the northeastern portion of the work area (Appendix 1, Map 1). Buffalo Cove Game Land lies mainly in Caldwell County, with a small portion in Wilkes County (Appendix 1, Map 2). Mitchell River Game Land is found in both Surry and Alleghany Counties (Appendix 1, Map 3), while TCGL lies mainly in Wilkes County with a small portion in Alleghany County (Appendix 1, Map 4). Several public roads, maintained by the North Carolina Department of Transportation (NCDOT) either traverse or are immediately adjacent all 3 game lands.

All of BCGL is dedicated by the N.C. Natural Heritage Program as the Buffalo Cove Game Land Dedicated Nature Preserve (Appendix 1, Map 5) (Appendix 2). Approximately 463 acres of MRGL is dedicated by the N.C. Natural Heritage Program as the Mitchell River Game Land Dedicated Nature Preserve (Appendix 1, Map 6) (Appendix 2).

Physical Attributes.

Buffalo Cove Game Land lies along the Blue Ridge Escarpment and within the Blue Ridge physiographic province. It is comprised of 2 main tracts, the Mingo Tract and the Long Ridge Tract (Appendix 1, Map 2). The game land is generally steep and rugged, and drained by fast flowing streams. Elevation ranges from 2,600 ft. at the highest peaks to 1,400 ft. along Buffalo Creek.

Mitchell River Game Land is comprised of 2 tracts, the Little Mountain Tract in Surry County and the Saddle Mountain Tract in Alleghany County (Appendix 1, Map 3). Approximately 840 acres of the Little Mountain Tract lies within the Piedmont physiographic province with the remainder of the Little Mountain Tract as well as the Saddle Mountain Tract located in the Blue Ridge physiographic province. The entire game land is generally steep and drained by fast flowing streams. Elevation ranges from a high of approximately 3,300 ft. on the Saddle Mountain Tract to a low of approximately 1,300 ft. on the Little Mountain Tract.

Thurmond Chatham Game Land also lies along the Blue Ridge Escarpment and within the Blue Ridge physiographic province. It is comprised of 3 separate tracts. The main portion of the game land (4,958 acres) lies west of Doughton Park (Blue Ridge Parkway) and east of N.C. Highway 18, "D Section" (1,506 acres) lies between Doughton Park and Stone Mountain State Park, and the Basin Creek Camping area (7.7 acres) lies immediately south of Doughton Park (Appendix 1, Map 4). The game land is generally steep and rugged, and drained by fast flowing streams. Elevation ranges from approximately 3,600 ft. near the Blue Ridge Parkway to approximately 1,600 ft. near Longbottom Road (S.R. 1728).

Climate

The climate for these game lands is generally classified as humid subtropical, with the portion of TCGL near the Blue Ridge Parkway and the Saddle Mountain Tract of MRGL within the transition zone between humid continental and humid subtropical climates ("Köppen-Geiger Climate Zones of the Continental United States", 2015).

Normal monthly mean temperature in North Wilkesboro, is 55.8°F (State Climate Office of North Carolina, 2015). Normal monthly minimum temperature occurs in January (23°F) and normal monthly maximum temperature occurs in July (88.5°F; State Climate Office of North Carolina, 2015). Average annual precipitation is 50.6" and is generally well distributed throughout the year (State Climate Office of North Carolina, 2015). Snowfall averages 9.9" annually (Spurlin's Best Places, 2015). Average annual last spring frost date in Lenoir is April 23 and first average annual fall frost date is October 17 (Ray's Weather Center, 2015). The preceding climatological parameters are generally representative of all three game lands.

It should be noted that these climate and weather parameters are for North Wilkesboro, NC (elevation 1,120 ft.). Some elevations on all three game lands are significantly higher than the elevation at North Wilkesboro, thus average temperatures are likely lower and average rainfall and snowfall greater at these higher elevations than in North Wilkesboro.

Soil

Fifteen soil types have been identified on BCGL, 24 on MRGL, and 22 on TCGL (Soil Survey Staff, 2015). The soils on BCGL can generally be classified, however, as sandy loam (67%), gravelly sandy loam (17%), and loam (16%) (Soil Survey Staff 2015) (Appendix 1, Map 7). At MRGL the soils can generally be classified as gravelly loam (34%), gravelly sandy clay loam

(12%), gravelly sandy loam (30%), stony loam (8%), stony sandy loam (7%), and other (9%) (Soil Survey Staff 2014) (Appendix 1, Map 8). At TCGL the soils can generally be classified as gravelly sandy loam (47%), loam (44%), cobbly sandy loam (5%), and other (4%) (Soil Survey Staff 2014) (Appendix 1, Map 9). 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

Buffalo Cove Game Land, TCGL, and almost all of MRGL lie within the Yadkin River Basin, which includes 7,221 square miles in North Carolina. A small portion of the Saddle Mountain Tract at MRGL drains into the New River Basin. Due to location and steep topography, most streams on these game lands are generally small and fast flowing. The exception is Buffalo Creek on BCGL which is a medium sized stream, but still fast flowing.

Major streams located on BCGL include Buffalo Creek, of which a good portion of the headwaters lie on the Long Ridge Tract. Other notable streams on BCGL include Laytown and Rockhouse Creeks along with Green Rock, Stone Mountain, Cling, Licklog, and Church Branches.

Notable streams located on MRGL include an unnamed tributary of Saddle Mountain Creek and several unnamed tributaries of Mitchell River.

Major streams located on TCGL include West Prong Roaring River, Joshua, Dungeon, Pike, Lovelace, Camp, and Basin Creeks, and Turkey Cove, Richardson, Noel, Cook, and Bell Branches.

History

The Mingo Tract (5,631 ac.) was purchased in 2003 with grants from the Natural Heritage Trust Fund (NHTF), the Clean Water Management Trust Fund (CWMTF), and the Ecosystem Enhancement Program (EEP). This acquisition provided the cornerstone of BCGL which was established in 2004. In 2005 the 986 acre Long Ridge Tract was acquired with grants from the NHTF and CWMTF to protect the headwaters of Buffalo Creek. The 16.4 acre Ferguson Tract was purchased in 2006 with NCWRC funds to solidify State ownership at northeast portion of the Mingo Tract. In 2007 the 19.9 acre Wooten Tract was purchased with NCWRC funding to extend State ownership to Buffalo Cove Rd. (S.R. 1504). Finally, in 2010 a land trade between NCWRC and Buffalo Mountain Estates was finalized to remove NCWRC from the Buffalo Mountain Estates Home Owner's Association.

The Piedmont Land Conservancy acquired the 1,716 acre Little Mountain Tract with a grant from the EEP and transferred the property to the State of N.C. This tract was entered into the Game Lands Program in 2005 and MRGL was established. In 2013 the 75 acre Ellis Tract was

transferred by Piedmont Land Conservancy to the State and was added to the Little Mountain Tract. The Saddle Mountain Tract of MRGL was formed through the acquisition of 4 properties. In 2005, the Conservation Trust for N.C. transferred 251 acres to the State and in 2008, Piedmont Land Conservancy transferred an adjoining 212 acres. In 2012, Piedmont Land Conservancy transferred an additional 45 acres to the State and in 2016 the Conservation Trust for N.C. transferred 2 adjacent tracts totaling 76 acres. These property acquisitions were funded with private donations and grants from the NHTF and were combined to form the Saddle Mountain Tract of MRGL.

Several adjoining privately owned parcels were purchased in the early 1950s with state and federal funds (Pittman-Robertson) and were combined to establish the Little Grandfather Wildlife Management Area which was later renamed TCGL (N.C. Wildlife Resources Commission 1996). A 7 acre tract, disjunct from the main game land properties, was purchased in 1967 near the intersection of Basin Creek and Longbottom Road (S.R. 1730) for the purpose of establishing a fish hatchery (N.C. Wildlife Resources Commission 1996). The hatchery was never constructed due to inadequate water flow and this tract now serves as a designated camping area (N.C. Wildlife Resources Commission 1996). In 2001, the Campbell (3 ac.) and the Longbottom Road (37 ac.) tracts were acquired with NCWRC funding to extend State ownership to Longbottom Road. In 2011, the 20 acre Ray Tract was acquired with NCWRC funding, in 2015, the 41 acre Blackburn Tract was acquired with NCWRC and federal (Pittman-Robertson) funds, and finally the 18 acre Morrison Tract was purchased in 2016 with NCWRC and federal funding. The Ray and Blackburn tracts extend State ownership to Longbottom Road, while the Morrison Tract extends State ownership to old N.C. Hwy. 18.

Habitats

Approximately 89% of BCGL is forested with the remainder comprised of various types of early successional habitat (N.C. State University 2008). In general, significant forest types on the game land are as follows: oak (73%), cove forest (10%), and pine (5%) (N.C. State University 2008). Important habitat types defined by the NCWAP and found on BCGL include riverine aquatic communities, bogs and small wetland communities, floodplain forest, early successional, cove forest, rock outcrops, and oak forests (including dry oak-pine) (N.C. Wildlife Resources Commission, 2015) (Appendix 1, Map 10). Each of these habitat types will be discussed in greater detail in subsequent sections.

Approximately 78% of MRGL is forested with the remainder comprised of various types of early successional habitat (N.C. State University 2008). In general, significant forest types on the game land are as follows: managed pine (44%), oak (24%), and cove forest (8%) (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 MRGL include riverine aquatic communities, bogs and small wetland communities, early successional, cove forest, and oak forests (including dry oak-

pine) (N.C. Wildlife Resources Commission, 2015) (Appendix 1, Map 11). Each of these habitat types will be discussed in greater detail in subsequent sections.

Approximately 95% of TCGL is forested. In general, significant forest types on the game land are as follows: cove (11%), pine (5%), and oak (77%) with the remainder comprised of various types of early successional habitat (3%) and developed areas along highways or game land access roads (2%) (N.C. State University 2008). Important habitat types defined by the NCWAP and found on TCGL 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, 2015) (Appendix 1, Map 12). Each of these habitat types will be discussed in greater detail in subsequent sections.

Surrounding Land Use

General land use surrounding BCGL is similar to that found through the central portion of the NCWRC Northern Mountains Work Area. An analysis of SEGAP data indicates the following conditions within a 5 mile radius of BCGL: non-industrial forests – 83%, shrub/scrub – 2%, developed – 4%, grass/forb – 1%, pasture/hay – 8%, managed pines – 2%, and other – <1% (N.C. State University 2008). Review of 2014 aerial photography reveals that non-industrial forests, residential dwellings, and agriculture dominate the landscape immediately adjacent BCGL.

General land use surrounding MRGL and TCGL is similar to that found along the Blue Ridge Escarpment in northwest North Carolina. An analysis of SEGAP data indicates the following conditions within a 5 mile radius of MRGL and TCGL: non-industrial forests – 65%, shrub/scrub – 3%, developed – 6%, grass/forb – 1%, pasture/hay – 20%, row crops – 1%, managed pines – 4%, and other – <1% (N.C. State University 2008). Review of 2014 aerial photography reveals that non-industrial forests, residential dwellings, and agriculture dominate the landscape immediately adjacent both game lands.

Landscape Context

Buffalo Cove Game Land, MRGL, and TCGL all serve as important conservation corridors enhancing the connectivity among public lands managed primarily for conservation purposes such as the Pisgah National Forest, Pond Mountain, Three Top Mountain, Johns River, South Mountains, Sandy Mush and Green River Game Lands, Stone Mountain State Park, Blue Ridge Parkway (Doughton Park), U.S. Army Corps of Engineer land surrounding Kerr Scott Reservoir, Little Fork Forests, Mitchell River Headwaters, Saddle Mountain, Cumberland Knob Recreation Area, and Fisher Peak Natural Heritage Natural Areas, and various other private tracts in the area that are managed for conservation purposes. In a broader sense BGGL, MRGL, and TCGL 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 west and north.

Purpose

The purpose of BCGL, MRGL, and TCGL is to manage habitats and communities to benefit aquatic and terrestrial wildlife resources on these properties. 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. These 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 BCGL, MRGL, and TCGL. Buffalo Cove Game Land is within easy driving distance of Lenoir, Morganton, Hickory, and Wilkesboro. Mitchell River Game Land is located near Wilkesboro, Dobson, and Mount Airy and TCGL is often utilized by residents of Wilkesboro, Lenoir, Hickory, and other nearby towns and cities. 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 all of BCGL and the Saddle Mountain Tract of MRGL (N.C. Natural Heritage Program. 2015) (Appendix 1, Maps 5-6) (Appendix 2). Additionally, both the Buffalo Cove Forests and the Buffalo Creek Gorge Natural Areas are located on BCGL (N.C. Natural Heritage Program. 2015). Both of these Natural Areas have an R-Rating of High and a C-Rating of Moderate. (N.C. Natural Heritage Program. 2015). The Saddle Mountain Natural Area is part of MRGL and has an R-Rating of Very High and a C-Rating of Moderate.

Buffalo Cove Game Land, MRGL, and TCGL all serve as important reservoirs for several rare species (N.C. Natural Heritage Program. 2015). These species are detailed in Table 2 below. In addition, many common species of both flora and fauna occur on these game lands.

Table 2. State endangered, threatened, significantly rare, and species of special concern present on BCGL, MRGL, and TCGL (N.C. Natural Heritage Program. 2015).

Scientific Name	Common Name	Last Observed	EO Status	ACCURACY	State Status	Federal Status	S Rank	G Rank	Game Land
Spilogale putorius	Eastern Spotted Skunk	2013-02-21	Current	2-High	SR-G		S2	G4	BCGL
Plestiodon anthracinus	Coal Skink	2005-06-02	Current	3-Medium	SR		S2S3	G5	BCGL
Myotis leibii	Eastern Small-footed Bat	1998	Current	5-Very Low	SC	FSC	S2	G1G3	MRGL
Passerculus sandwichensis	Savannah Sparrow	2000-06-19	Current	5-Very Low	SR		S2B,S5N	G5	MRGL
Quercus ilicifolia	Bear Oak	2009-03-10	Current	2-High	E		S2	G5	MRGL
Myotis leibii	Eastern Small-footed Bat	1998	Current	5-Very Low	SC	FSC	S2	G1G3	TCGL
Barbilophozia barbata	A Liverwort	1954	Historical	4-Low	SR-D		S1	G5	TCGL
Aquila chrysaetos	Golden Eagle	2014-02	Current	1-Very High	SR	BGPA	SXB,S1N	G5	TCGL
Falco peregrinus	Peregrine Falcon	1954	Historical	4-Low	E		S1B,S2N	G4	TCGL
Satyrium favonius ontario	Northern Oak Hairstreak	2000-06-24	Current	4-Low	SR		S2S3	G4T4	TCGL
Euchloe olympia	Olympia Marble	2014-04-02	Current	2-High	SR		S1	G4G5	TCGL
Mononeuria groenlandica	Greenland Sandwort	2002-07-07	Current	3-Medium	T		S2	G5	TCGL
Spilogale putorius	Eastern Spotted Skunk	2014-02-04	Current	1-Very High	SR-G		S2	G4	TCGL

Hunting is a popular activity on all three game lands with white-tailed deer and wild turkey the two primary big game species. Bear are also common on BCGL and are hunted there. Both BCGL and TCGL are 6 day per week game lands, while MRGL is a 3 day per week game land.

Deer populations on all three game lands were impacted by a severe epizootic hemorrhagic disease (EHD) outbreak in the region in late summer and early fall 2012 and the populations on these game lands continue to recover from that event.

Deer harvest at BCGL was 0.87/mi^2 in 2012, 0.48/mi^2 in 2013, and 0.87/mi^2 in 2014. Does comprised 33% (2012), 40%, (2013) and 33% (2014) of the harvest. The deer herd at BCGL is very low density, but generally stable. Habitat conditions on the game land as well as on immediately adjacent private property are generally poor. Turkey hunting is also popular at BCGL with 12 gobblers harvested from 2013-15. Black bear have increased their range over the past 20 years in North Carolina and are common on BCGL. Since 2012, 4 bears have been harvested on the game land. Gray squirrel, ruffed grouse, crow, red and gray fox, bobcat, raccoon, and opossum are small game and furbearer species found and hunted for on BCGL.

Deer harvest at MRGL was 10.8/mi^2 in 2012, 5.0/mi^2 in 2013, and 7.8/mi^2 in 2014. Does comprised 36% (2012), 28%, (2013) and 36% (2014) of the harvest. The deer herd at MRGL is generally stable and benefits greatly from excellent habitat conditions on adjacent private properties. Turkey hunting is also popular at MRGL with 11 gobblers harvested from 2013-15. Black bear have increased their range over the past 20 years in North Carolina and are present on MRGL, but only at low numbers. Since 2012, only 1 bear has been harvested on the game land. Gray squirrel, ruffed grouse, cottontail rabbit, crow, red and gray fox, bobcat, raccoon, and opossum are small game and furbearer species found and hunted for on MRGL.

Deer harvest at TCGL was 2.0/mi^2 in 2012, 1.3/mi^2 in 2013, and 1.7/mi^2 in 2014. Does comprised 45% (2012), 31%, (2013) and 35% (2014) of the harvest. Thurmond Chatham Game Land was near the epicenter of the regional EHD outbreak in 2012 and continues to recover from that event. Turkey hunting is also popular at TCGL with 12 gobblers harvested from 2013-15. Black bear are common on TCGL, however the game land serves as a black bear sanctuary and bear hunting is prohibited. Gray squirrel, ruffed grouse, crow, red and gray fox, bobcat, raccoon, and opossum are small game and furbearer species found and hunted for on TCGL.

Buffalo Cove Game Land has several streams managed as Public Mountain Trout waters and classified as Wild Trout Waters. The major fisheries are Buffalo Creek and Rockhouse Creek, which harbor Brown Trout (*Salmo trutta*) and Brook Trout (*Salvelinus fontinalis*). Access is difficult; thus, fishing pressure is light. Other streams on BCGL managed as Wild Trout Waters are Stone Mountain Branch, Cling Branch, McCloud Branch, Laytown Creek, and Green Rock Branch. In general, these streams have poor access and offer few trout. All streams on TCGL are Public Mountain Trout Waters, and with the exception of Pike Creek, are classified as Wild Trout Waters. Joshua Creek contains Rainbow Trout (*Oncorhynchus mykiss*) and Lovelace

Creek contains Brook Trout, but all other Wild Trout Waters on TCGL provide negligible fishing opportunities due to their small size and limited trout densities. Pike Creek, along with three ponds on TCGL (Bell Branch Pond, Boundary Line Pond, and Pike Creek Pond), are managed as Hatchery Supported Trout Waters. These waters are stocked with Brook, Brown, and Rainbow Trout during the spring and early summer months. As a result of limited aquatic habitat, there are no managed sport fisheries at MRGL.

Birding opportunities are available on all 3 game lands and they offer birders opportunity to encounter both forest interior species and those that prefer edge to more open habitats. Thurmond Chatham Game Land is designated as part of the N.C. Birding Trail.

The NCWAP (N.C. Wildlife Resources Commission, 2015) is a comprehensive wildlife conservation plan that prioritizes species of greatest conservation need (SGCN). Approval of this plan by the United States Fish and Wildlife Service makes NCWRC eligible for State Wildlife Grant funding to address SGCN through inventory, monitoring, research, and management. The list of priority species not only consists of threatened and endangered species but also those that are not state or federally listed but in need of inventory, monitoring, and/or research.

These game lands also offer opportunities for other outdoor recreational activities. The Saddle Mountain Tract of MRGL offers a 2 mile designated hiking trail that leads to the top of Saddle Mountain. While BCGL and TCGL offer no designated hiking trails, hiking is encouraged with many gated access roads and old woods roads offering abundant opportunity. A 5.7 mile designated horse trail is provided on MRGL, with riding available seasonally from mid-May through August. The Basin Creek Designated Camping Area at TCGL provides horseback riders utilizing the adjacent horse trail on Doughton Park (Blue Ridge Parkway) a location for overnight stay as well as an area for day users to park. A designated horseback riding trail is not offered on BCGL due to a lack of suitable roads (graveled) of sufficient length available there.

At TCGL, Basin and Pike creeks watersheds are classified as Outstanding Resource Water (ORW; N.C. Division of Water Resources 2013). Additionally, the entire MRGL within the Mitchell River watershed is classified as ORW (N.C. Division of Water Resources 2013). These high water quality ratings within MRGL provide more protection downstream for the Brook Floater (*Alasmidonta varicose*) (FSC, NCT).

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 BCGL, MRGL, and TCGL.
- Manage popular sport fish and game species at appropriate levels through science based land management and sound regulations on BCGL, MRGL, and TCGL.
- Provide quality habitat for endangered, threatened, and rare species located on BCGL, MRGL, and TCGL 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 BCGL, MRGL, and TCGL.

MEASURES OF SUCCESS

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

- Surveys of user groups indicate general satisfaction with management on BCGL, MRGL, and TCGL.
- Valid public complaints regarding management of BCGL, MRGL, and TCGL 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 10-12).

Oak Forest

Oak forests are by far the predominant habitat type on both BCGL and TCGL. Oak Forest is subdivided as either Southern Appalachian oak forest (SAOF) or dry oak-pine forest. This habitat type covers a wide range of moisture and topographic gradients, from xeric (dry) to mesic (wet). Oak forests are of great importance to wildlife across all 3 game lands due to their predominance, the variety of conditions in which they are found, and their overall mast production capacity. This habitat type produces vast quantities of acorns, hickory nuts, and a wide variety of associated soft mast forage for wildlife and is often a critical habitat type for a variety of wildlife species (N.C. Wildlife Resources Commission, 2015).

Southern Appalachian Oak Forest

- Current Extent and Condition

Southern Appalachian oak forest occupy 73% of BCGL, 24% of MRGL, and 77% of TCGL. This forest type is generally found on mesic sites with deep, residual, and often rocky soils (NatureServe 2007). It is often located on open slopes, ridgetops, lower elevation peaks, and higher parts of broad valleys (NatureServe 2007). SAOF is usually dominated by oak species, most typically northern red oak (*Quercus rubra*), 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). Prior to the blight, American chestnut (*Castanea dentate*) was once the dominant or co-dominant species of these forests (NatureServe 2007). The understory and shrub layer ranges from sparse to dense thickets of ericaceous shrubs to open with a sparse to moderate herbaceous layer. Fire occurs fairly frequently in SAOF and is usually of low to moderate intensity and is typically non-catastrophic (Abrams 1992, Delacourt and Delacourt 1997). Fire is often an important factor favoring oak dominance over more

mesophytic (moisture adapted) tree species within these forests and can be expected to have a moderate effect on vegetation structure, producing a somewhat more open canopy (NatureServe 2007).

- 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 with an average diameter at breast height (DBH) of 16 inches and with a very open understory with a native grass and forb component as the dominant ground cover. Relative over-all abundance of mountain laurel and rhododendron (*Rhododendron spp*.) is reduced in stands where active management occurs. 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 lands to promote landscape diversity.

- Target Game Species

Target game species include white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), black bear (*Ursus americanus*), ruffed grouse (*Bonasa umbellus*), 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 in Southern Appalachian Oak Forest on BCGL, MRGL, or TCGL. Some examples from the 2015 edition include worm-eating warbler (*Helmitheros vermivora*), cerulean warbler (*Setophaga cerulean*), Kentucky warbler (*Geothlypis formosa*), timber rattlesnake (*Crotalus horridus*), Eastern box turtle (*Terrapene carolina*), Wehrle's salamander (*Plethodon wehrlei*), Eastern small-footed bat (*Myotis lebeii*) and Northern long-eared bat (*Myotis septentrionalis*).

- 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, planting of white oak and northern red oak, herbicide use to control competition with oak regeneration where needed, and prescribed burning to promote oak regeneration. In general, oak woodlands will be primarily emphasized across all

areas where they are accessible and operable for timber harvest and/or prescribed burning. In some cases, oak savannahs may be developed to increase diversity and will be created though timber harvest (primarily heavy shelter-wood cutting) and appropriate prescribed burning rotations. Old growth oak stands will be developed on dedicated primary areas or areas inaccessible and/or inoperable for active management. Participation in American chestnut restoration efforts will occur as appropriate and feasible. Cooperative projects including prescribed burning with adjacent federal and state landowners will aid in expanding opportunities for management.

- Infrastructure needs

Increased planning, identification, and development of fire lines and suitable access to stands and potential burn units will be needed. Temporary logging roads and landings may need to be constructed with new gates installed to control access where appropriate. New and temporary road construction will be limited to that which is necessary to implement management and will be engineered in accordance with state BMP's (Best Management Practices) and with consideration to run-off and sedimentation.

- Management Challenges

Challenges include limited options for management within dedicated primary areas, increased establishment and spread of non-native invasive species, increased development and expansion of adjacent private/urban interface along game land boundaries, limitations due to topography and access, limited burning opportunities, and climate change. Impacts from disease and insects such as: southern pine beetle (*Dendroctonus frontalis Zimmermann*), gypsy moth (*Lymantria dispar*), sudden oak death syndrome, hypoxylon canker (*Hypoxylon spp*.), and regional oak decline are additional challenges to the management of Southern Appalachian oak forests.

Dry Oak-Pine Forest

- Current Extent and Condition

Dry oak-pine forest occupies <1% of MRGL and TCGL and is absent on BCGL. This forest system occurs on much drier sites than other oak matrix forests. It is characteristic of coarse and infertile soils that are often shallow and associated with acidic igneous or metamorphic rock. This habitat type is generally positioned on exposed ridges and convex slopes that are generally well drained, which contributes to the dry conditions of these forests (Schafale and Weakley 1990). These forests are often dominated by oak species such as chestnut oak, scarlet oak, and white oak with cohorts of co-dominant tree species such as mockernut hickory (Carya *tomentosa*), shortleaf pine (*Pinus echinata*), and Virginia pine (*Pinus virginiana*). Dry oak-pine forests occur with varying conditions and structure, from open savannah like conditions to closed canopy. Understory in these forests commonly consists of a sparse to moderate herb layer with

associations of heath type shrubs such as blueberry, huckleberry, and mountain laurel particularly on the driest sites. Where fire is common, more open stands with a grass component at ground level may also be found. In areas where fire has been suppressed, red maple and white pine (*Pinus strobus*) are often common canopy species (NatureServe 2007). Fires in this system occur more frequently than in SAOF, with fire occurring most often within the dormant season with an occasional growing season fire occurring once or twice every 20- 25 years (Croy and Frost 2007).

- Desired Future Condition

DFC consists of a diverse mix of common oak species along with pine species such as shortleaf, table mountain (*Pinus pungens*), and pitch pine (*Pinus rigida*). Generally, oak-pine woodlands will have a mix of age classes and size distribution with advanced oak-pine regeneration available to perpetuate the stand. Disturbances at relatively short intervals (primarily fire) will perpetuate oak-pine savannas, areas which will generally have a much more open canopy and include a very open understory consisting of native grass and forbs as the dominant ground cover. On drier sites a greater abundance of blueberry and huckleberry is found in the understory. Relative over-all abundance of mountain laurel and rhododendron is reduced throughout all areas. Old growth oak- pine stands will establish in areas unsuitable for timber harvest or prescribed burning, eventually developing an all age class distribution of large, medium and small trees dispersed throughout the stand. However, in the absence of routine disturbance composition will likely revert to an all hardwood system.

- Target Game Species

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

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur in dry oak-pine forest on these game lands. Some examples from the 2015 edition include brown-headed nuthatch (*Sitta pusilla*), red-headed woodpecker (*Melanerpes erythrocephalus*), timber rattlesnake, Eastern box turtle, coal skink (*Plestiodon anthracinus*), and Northern long-eared bat.

- 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, planting of white oak and shortleaf pine, herbicide use to control competition with oak and pine regeneration, and prescribed burning to promote oak and pine regeneration. In general, both oak- pine woodlands and savannahs will be emphasized across all areas where they are accessible and operable for timber harvest

and or prescribed burning. Cooperative projects including prescribed burning with adjacent federal and state landowners will expand opportunities for management.

- Infrastructure Needs

Increased planning, identification, and development of fire lines and suitable access to stands and potential burn units will be needed. Temporary logging roads and landings may need to be constructed with new gates installed to control access where appropriate. New and temporary road construction will be limited to that which is necessary to implement management and will be engineered in accordance with state BMP's (Best Management Practices) and with consideration to run-off and sedimentation.

- Management Challenges

Challenges include limited options for management within dedicated primary areas, increased establishment and spread of non-native invasive species, increased development and expansion of adjacent private/urban interface along game land boundaries, limitations due to topography and access, limited burning opportunities, and climate change. Impacts from disease and insects such as: southern pine beetle, gypsy moth, sudden oak death syndrome, hypoxylon canker, and regional oak decline are additional challenges to the management of oak- pine forests on game lands.

Cove Forest

- Current Extent and Condition:

Cove forests occupy 10% of BCGL, 8% of MRGL, and 11% of TCGL. Cove forests are generally found in hollows or small valleys that promote moist conditions and often occur on east or north facing slopes. This forest type consists of mesophytic hardwood or hemlock-hardwood forests of sheltered topographic positions (NatureServe 2007). The hemlock-hardwood association occupies the following: BCGL (1%), MRGL (3%), and TCGL (1%). The mesophytic hardwood association 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.

Cove forests are typically closed canopy systems with characteristic species typically including yellow poplar (*Liriodendron tulipifera*), Carolina silverbell (*Halesia carolina*), northern red oak, Eastern hemlock (*Tsuga canadensis*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), American Beech (*Fagus grandifolia*), cucumber *(Magnolia acuminate)*, and fraser magnolia (*Magnolia fraseri)* (Clebsch and Busing 1989) (NatureServe 2007). Many of these forests exhibit a more un-even aged structure

than other forest types and regeneration is commonly regulated through gap-phase dynamics and patch openings created by wind and ice. Although fire plays a lesser role in this habitat type, it does occur infrequently and at low intensities burning in a mosaic pattern. Fire effects in these habitats were likely minimal as many of the species that occur here are some of the most fire-intolerant in the region (NatureServe 2007).

- Desired Future Condition

DFC includes ensuring that overstories consist of a diversity of species and have lush understories containing a wide diversity of herbs and forbs. Stands should have a diverse age class distribution and species composition, with functioning old growth systems present. Viable stands of hemlocks should be conserved. Streamside management zones/riparian buffers should be retained, protected and functioning. Areas of early successional habitat should be provided at appropriate levels to ensure wildlife and seral stage diversity. Invasive species should be monitored and controlled as appropriate.

- Target Game Species

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

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur in Cove Forest on these game lands. Some examples from the 2015 edition include cerulean warbler, Swainson's warbler (*Limnothlypis swainsonii*), acadian flycatcher (*Empidonax virescens*), Louisiana waterthrush (*Parkesia motacilla*), , Eastern box turtle, Wehrle's salamander, and Northern long-eared bat.

- Management Strategies and Needs

Management strategies include identifying, protecting, and treating hemlock stands where possible to reduce loss of species, protecting riparian buffers along streamside management zones, and harvesting timber where appropriate using a mix of thinning (with attention to retaining a diverse mix of species beneficial to wildlife, including black walnut, persimmon, black cherry, etc.) and group selection techniques to create early successional wildlife habitat via 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. Land managers should identify important cove forests to protect from potential damage from prescribed burning and use appropriate and less intense burning techniques when this habitat type is included in burn units.

- Infrastructure Needs

Increased planning, identification, and development of fire lines and suitable access to stands and potential burn units will be needed. Temporary logging roads and landings may need to be constructed with new gates installed to control access where appropriate. New and temporary road construction will need to be limited to that which is necessary to implement management and will be engineered in accordance with state BMP's (Best Management Practices) and with consideration to run-off and sedimentation.

- Management Challenges

Management challenges include incompatible adjacent land uses, establishment and proliferation of non-native invasive species, proliferation of Hemlock Wooly adelgid (*Adelges tsugae*) killing Eastern hemlock trees, climate change, and inability to conduct active management due to steep slopes, limited access, poor soils, and restrictive natural area dedications.

Pine Forest

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 5% at BCGL, 1% at MRGL, and 5% at TCGL. This habitat type tends to occupy the southern exposures and broader ridge tops of gently rolling terrain. It is often associated with shallow and generally sandy soils, and found at mid to low elevations less than 3000 feet (Fryar 2004). The dominant tree species in this forest type include Shortleaf pine, which typically occupies more than 50% of the over-story, pitch pine, Virginia pine, and occasionally Eastern white pine. On some sites, oaks and hickories may also occur in the over-story.

Under historic natural fire regimes, where fire occurred more frequently, these systems likely consisted of herbaceous (grassy) understories, with a relatively sparse woody shrub layer (Fryar 2004). However, acidic-tolerant shrubs such as blueberry and huckleberry may also be well-developed in these forests. The amount of herbs and shrubs is greatly linked to the frequency of fire, with stands that burn more frequently having a greater abundance of grasses and herbs and stands with less frequency of fire having a greater abundance of shrubs (NatureServe 2007). In the absence of fire, understory species are often fire-intolerant and shade-tolerant hardwoods such as dogwood, red maple, sassafras (*Sassafras albidum*), sourwood (*Oxydendrum*

arboreum), and black gum among others. Following over-story replacement events, Virginia pine, if previously a component or in adjacent stands, can quickly replace native shortleaf communities (Frost 2005). Fire is clearly an important influence in these forests, and may be the sole factor determining the occurrence of this system in lieu of hardwood forests. Natural fires were likely frequent and of low intensity, or a mix of low and higher intensity. Settlement, logging, pine beetle outbreaks, and fire suppression have potentially altered the character and blurred the boundaries of these type forests more than most other systems in the region (NatureServe 2007).

- Desired Future Condition

DFC is an open overstory consisting of woodland and "savannah like" conditions. Composition consists predominantly of mountain yellow pine species but includes some dry oak species such as scarlet oak, chestnut oak, and white oak. Table mountain and pitch pine stands will be managed for on higher elevation sites, while shortleaf pine will be favored on lower elevation sites. The understory should contain a diversity of grasses and forbs, with some sites dominated by grasses. On drier sites, an abundance of blueberry and huckleberry should be found. Stands will have a mix of age classes and size distributions as well as increased regeneration of shortleaf, table mountain, and pitch pine found throughout the understory. Relative over-all abundance of mountain laurel and rhododendron should be reduced throughout.

- Target Game Species

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

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur in dry coniferous woodlands on these game lands. Some examples from the 2015 edition include brown-headed nuthatch, prairie warbler (*Setophaga discolor*), red-headed woodpecker, timber rattlesnake, Eastern box turtle, coal skink, and Northern long-eared bat.

- Management Strategies and Needs

Management of dry coniferous woodlands consists of relatively frequent and repeated prescribed burning to reduce hardwood competition, 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 instances, when restoration or reclamation from hardwood conversion is needed; stand replacement fires, timber harvest (thinnings), or other forestry practices may be used. In areas devastated by disease and or pests, complete overstory removal or heavy thinnings may be used. Combinations of natural

regeneration or planting of shortleaf pine may be used to regenerate stands. Applications of herbicide to sites where there is a need to control competitive vegetation and non-native invasive species may be required.

- Infrastructure Needs

Increased planning, identification, and development of fire lines and suitable access to stands and potential burn units will be needed. Temporary logging roads and landings may need to be constructed with new gates installed to control access where appropriate. New and temporary road construction will need to be limited to that which is necessary to implement management and will be engineered in accordance with state BMP's (Best Management Practices) and with consideration to run-off and sedimentation.

- Management Challenges

Challenges include limited options for management within dedicated primary areas, increased establishment and spread of non-native invasive species, increased development and expansion of adjacent private/urban interface along game land boundaries, increased competition from Virginia pine and Eastern White pine regeneration where disturbances are limited, lack of fire, successional change, limitations due to topography and access, limited burning opportunities, climate change, encroachment from hardwoods, and impacts from disease and insects such as southern pine beetle.

Managed Pine Forest

- Current Extent and Condition

This forest type comprises about 44% of MRGL. It is absent on BCGL and TCGL. These are primarily loblolly pine and white pine plantations planted by the former landowners. These pine plantations on MRGL are relatively young, averaging 15 to 20 years of age. However, due to fire exclusion and white pine's shade tolerance, this species 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 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 light amounts of ericaceous shrubs such as blueberry and mountain laurel, a few mixed hardwood saplings, and/or scattered pine regeneration.

- Desired Future Condition

All artificial pine monoculture/plantation conditions are restored through conversion to natural forest communities, including oak and pine woodlands and savannahs, that have

open overstories, diverse pine and hardwood species composition, and that are structurally beneficial to wildlife. Understories are developed and diverse consisting of a mix of herbs, grasses, and forbs. Cove forests will be established on appropriate sites and natural hydrologic functions restored. Dry coniferous woodlands will be established on the driest sites and ridges with natural disturbance regimes restored. Oak forests will occupy the mid and intermediate slopes with natural disturbance regimes restored. Non-native invasive species will be monitored and controlled as appropriate.

- Target Game Species

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

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on BCGL, MRGL, or BCGL. The targets will depend upon whether the DFC is cove forest, dry coniferous woodland or oak forest (see above for targets in each system). Also, early successional habitats (see below) will be ephemeral habitat in these areas after and during management but it may also be a DFC in certain locations.

- Management Strategies and Needs

Management strategies will primarily involve timber harvest consisting of clear cutting and thinning as stands mature and develop into merchantable timber. Natural regeneration of hardwoods will be key to diversifying these stands and developing a desired future mixed pine-hardwood composition. Plantings including that of oaks and shortleaf pine as well as some herbicide use may be employed where needed to develop pine-oak stands. Where appropriate and needed, prescribed burning will also be used.

- Infrastructure Needs

Increased planning, identification, and development of fire lines and suitable access to stands and potential burn units will be needed. Temporary logging roads and landings may need to be constructed with new gates installed to control access where appropriate. New and temporary road construction will need to be limited to that which is necessary to implement management and will be engineered in accordance with state BMP's (Best Management Practices) and with consideration to run-off and sedimentation.

- Management Challenges

Challenges include stands or portions of managed pine stands within dedicated primary areas remaining in monoculture conditions. Other challenges include increased establishment and spread of non-native invasive species, increased development and

expansion of adjacent private/urban interface along game land boundaries, limitations due to steep topography and limited access, limited burning opportunities, climate change, and impacts from disease and insects such as southern pine beetle.

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.

Herbaceous

- Current Extent and Condition

Herbaceous ESH is comprised of grasses and forbs and is lacking a significant woody component. It occupies 1% of both BCGL and TCGL and <1% of MRGL. The majority of herbaceous ESH on all 3 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. This habitat is generally maintained using a variety of standard agricultural practices.

Wildlife opening planted to a mixture of brassicas and legumes, TCGL.

- Desired Future Condition

DFC includes maintaining currently planted openings and expanding the acreage of natural (especially in burned areas) and planted herbaceous ESH where appropriate, to create habitat diversity across the game lands. 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, and ruffed grouse.

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur in herbaceous ESH on these game lands. Some examples from the 2015 edition include American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), savanna sparrow (*Passerculus sandwichensis*), Bobolink (*Dolichonyx oryzivorus*), coal skink, timber rattlesnake, and Eastern box turtle. 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, disking, planting, the application of soil amendments, and day-lighting.

Administrative access road converted to linear wildlife opening, TCGL.

- 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. Shrub-Scrub ESH occupies 1% of BCGL and MRGL and <1% at TCGL. Most of this habitat type is located in recent timber sales with the remainder located along utility rights-of-way, roadways, forest canopy gaps, old abandoned fields, etc.

Small opening established at BCGL to create shrub-scrub habitat.

- Desired Future Condition

DFC includes a mix of shrub/scrub ESH created by timber harvests and prescribed burning to create diversity on the landscape. An important DFC is to provide a continuous supply of this habitat type through time. 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, woodcock, and ruffed grouse.

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur in shrub-scrub ESH on these game lands. Some examples from the 2015 edition

include prairie warbler (*Setophaga discolor*), timber rattlesnake, and coal skink. 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. 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. This habitat type occupies 8% of BCGL, 21% at MRGL, and 2% of TCGL.

- 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, black bear, rabbit, woodcock, and ruffed grouse.

- Target Non-Game Species

Target non-game species include those outlined in the NCWAP that occur or potentially occur in woody ESH. Some examples from the 2015 edition include prairie warbler and coal skink. 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.

Rock Outcrops

- Current Extent and Condition

This habitat type includes both high and low elevation rock outcrops and 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). On all 3 game lands, this habitat is mainly found embedded in forested habitat and comprises less than 1% of each game land. 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 these game lands. Some examples from the 2015 edition include coal skink, timber rattlesnake, Eastern small-footed bat, Northern long-eared bat, Alleghany wood rat (*Neotoma magister*), and rock vole (*Microtus chrotorrhinus*).

- 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 and assess appropriate management.

- 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

Floodplain forest is located along streams and occurs at very low levels, occupying no more than 1% of BCGL, MRGL, or TCGL. Dominant tree species include a mixture of bottomland and mesophytic hardwoods such as: American sycamore (*Platanus occidentalis*), yellow poplar, American beech, white ash, American elm (*Ulmas*

americana), river birch (*Betula nigra*), box elder (*Acer negundo*), red maple, and black walnut (*Juglans nigra*). Other common trees include; green ash (*Fraxinus pennsylvanica*), American holly (*Ilex opaca*), Southern hackberry (*Celtis laevigata*), American hornbeam (*Carpinus caroliniana*), and to a lesser extent some oaks and hickories. The herbaceous and shrub layers in these forests can be extremely diverse, with the density and abundance of species closely linked to the level of disturbance and soil type (NatureServe 2007). Understories can range from densely closed thickets to open woodlands and may consist of such species as, spicebush (*Lindera benzoin*), Strawberry-bush (*Euonymus americanus*), Dog-hobble (*Leucothoe fontanesiana*), alder (*Alnus spp.*), and a variety of herbs and forbs. Vines are also particularly common in floodplain forests and typically include Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), and *Smilax* spp. (Schafale and Weakley 1990).

These forests are rarely impacted by fire except under extreme drought conditions, but are more commonly regulated and maintained by seasonal and annual flooding events. Not only do these flooding events effect soil movement and deposition, but they also play a major role in seed dispersal, plant successional processes, and the creation of vernal pools. Beavers can also be an important disturbance factor in these forests, setting back succession, creating canopy gaps, and developing semi-permanent wetlands within these forests (Schafale and Weakley 1990). Floodplain forests are particularly important habitats for breeding amphibians, especially where there are inclusions of floodplain pools and semi-permanent impoundments. (N.C. Wildlife Action Plan, 2015). This habitat type is also favored by American woodcock during their migration.

- Desired Future Conditions (DFC)

Since the vast majority of the floodplain forests found on these game lands are located within dedicated primary natural areas and streamside management zones, the over-story of this forest type will remain predominantly closed. Natural disturbances such as flooding with sediment deposition and beaver activity will continue to occur and will influence forest composition and structure. Natural hydrologic functions of these forests will be maintained. Over-story and understory composition will consist of a wide diversity of species suited to hydric soils. Non-native exotic species will be monitored and controlled as appropriate.

- 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 these game lands. Some examples from the 2015 edition include red headed woodpecker, Kentucky warbler, mole salamander (*Ambystoma talpoideum*), four-toed salamander (*Hemidactylium scutatum*), and tri-colored bat (*Perimyotis subflavus*).

- Management Strategies and Needs

Management strategies include identifying and protecting floodplain forests while retaining appropriate buffers along either side of the associated streams and their tributaries. Management to the extent allowed will be implemented for the purposes of maintaining or enhancing fish and wildlife habitat while ensuring erosion and siltation issues are adequately addressed. In some cases, where feasible and appropriate, prescribed fire may be allowed to enter into this habitat, particularly where the rivers and associated tributaries can be utilized as natural firebreaks or where management of river cane is needed. Limited forestry activities may be used where permitted to develop woodcock and other wildlife habitat. Applications of herbicide may be implemented where allowed when there is a need to control non-native invasive species. Old growth stands will be allowed to develop over time within streamside management zones and riparian buffers.

- Infrastructure Needs

Increased planning, identification, and development of access to key areas may be needed. This 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

Challenges to management of floodplain forests include limited management opportunities within dedicated primary natural areas along with the increased probability of establishment and spread of non-native invasive species from flooding events. Access limitations and siltation from upstream sources on private land are also challenges within floodplain forests.

Bogs and Small Wetland Communities

- Current Extent and Condition

Bogs and small wetlands comprise <1% of BCGL, MRGL, or TCGL. It is mainly found embedded within forested habitat in very small quantities. This is a very important habitat type due to the complex of species that utilize and depend on it and it 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 woodcock, and raccoon.

- Target non-game species

Target non-game species include those outlined in the NCWAP that occur or potentially occur on these game lands. Examples include the bog turtle (*Glyptemys muhlenbergii*), four-toed salamander, and mole salamander.

- 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 head-cutting or erosion problems, and removing drainage devices. For some wetlands or bogs, 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

Buffalo Cove Game Land has several streams managed as Public Mountain Trout waters and classified as Wild Trout Waters. The major fisheries are Buffalo Creek and Rockhouse Creek, which harbor Brown Trout (*Salmo trutta*) and Brook Trout (*Salvelinus fontinalis*). Other streams classified as Wild Trout Waters are Stone Mountain Branch, Cling Branch, McCloud Branch, Laytown Creek, and Green Rock Branch. At TCGL, Joshua Creek offers fishing for Rainbow Trout and Lovelace Creek offers fishing for Brook Trout.

Buffalo Creek, BCGL.

- Desired Future Conditions (DFC)

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

- Target game species

Target game species include furbearers. The target cold water game fish species are Brook Trout (*Salvelinus fontinalis*), and Brown Trout (*Salmo trutta*) on BCGL and Rainbow Trout and Brook Trout on TCGL.

- Target non-game species

To date no federal or state listed species occur on these game lands. The state listed Brook Floater (*Alasmidonta varicose)* (FSC, NCT) occurs downstream in the Middle Prong Roaring River and in the Mitchell River (North Carolina Natural Heritage Program 2015).

- Management Strategies and Needs

Riparian buffers will be those required by the NHP Dedication or easements. Where dedications or easements are not in place 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. 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 fish 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

Infrastructure improvements are needed to address erosion wherever it is occurring. Eroding foot trails and forest roads are the greatest sources of fine sediment pollution on most game lands 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 the most cost effective method available for achieving desired habitat conditions and diversity across the landscapes of these game lands. These practices are instrumental to restoring communities to diverse compositions and structures. However, due to factors such as inaccessibility, Natural Heritage dedication restrictions, steep terrain, and or unsuitable timber, not all portions of these game lands are conducive for forest management. Much of the forest management across BCGL and MRGL to date was implemented by former land owners, however, on TCGL forest management has been implemented primarily by the NCWRC on a stand by stand basis with emphasis on priorities for wildlife habitat enhancement, ecosystem restoration, timber stand improvement, and increasing access.

One of the primary focuses of forest management on these game lands is restoring ecosystem functionality and improving wildlife habitat throughout all forested communities. Forestry practices are key to restoring communities to diverse compositions and structures. Due to the lack of recent disturbances and past poor land use practices, many of the forested communities across these tracts are degraded, dying, and are being replaced by more shade tolerant, mesic tree species such as yellow poplar, Eastern white pine, and red maple. To restore, enhance, and increase overall diversity across these game lands, silvicultural and forest management practices such as prescribed fire, timber harvest, reforestation, herbicide applications, KG blading, and mechanical release are necessary. 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. These techniques will be used to achieve game land wildlife habitat goals and objectives.

Forest Land Class/Types and Conditions

Past land use history (agricultural grazing, land clearing, commercial forestry) and disturbance (natural and human caused) vary across these 3 game lands, and have shaped the current forest types and conditions seen today. The figures below detail the current land class/forest type by percentage for each of these properties.

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

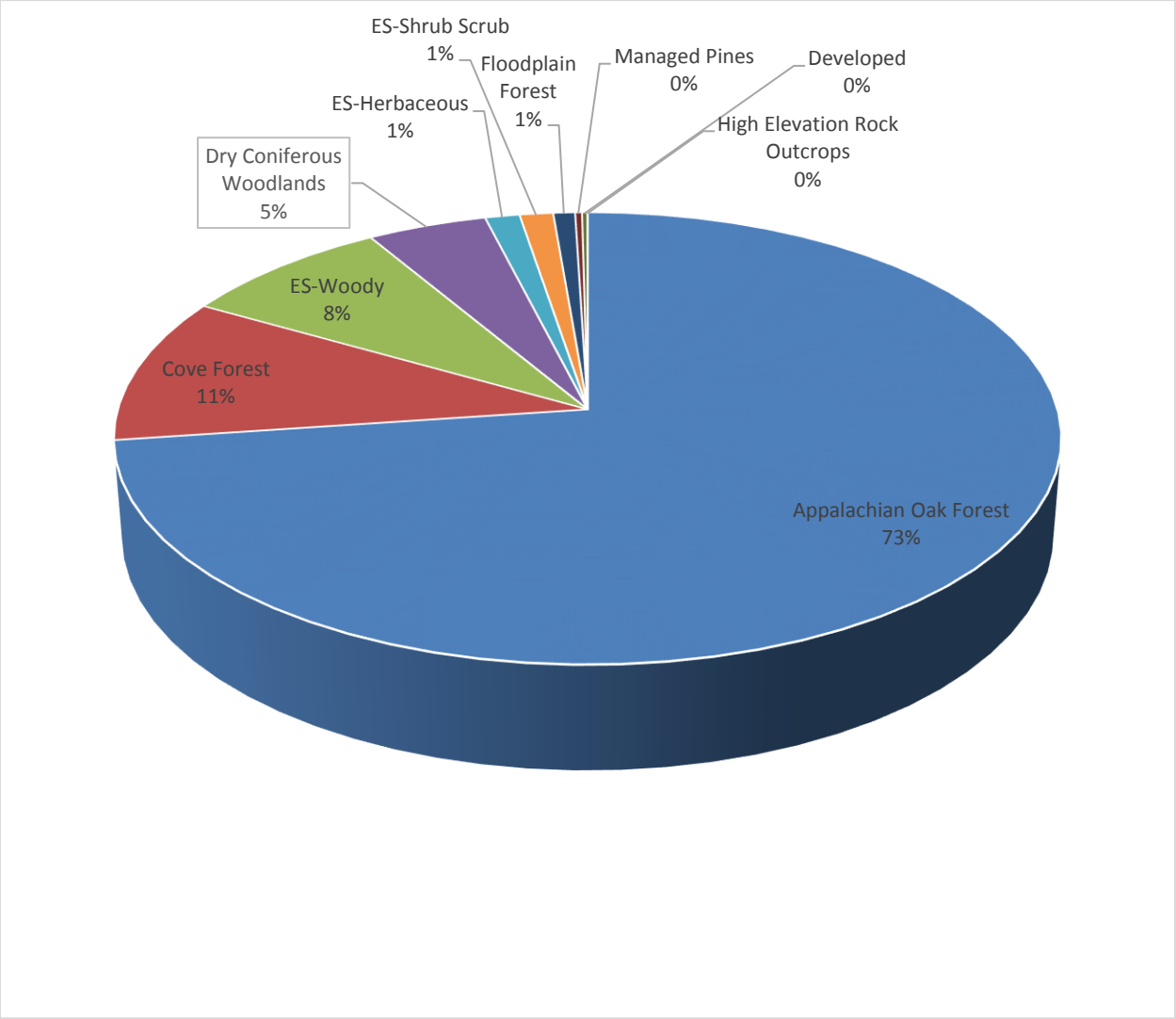


Figure 2: Forest Land Class/Types on MRGL (N.C. State University 2008).

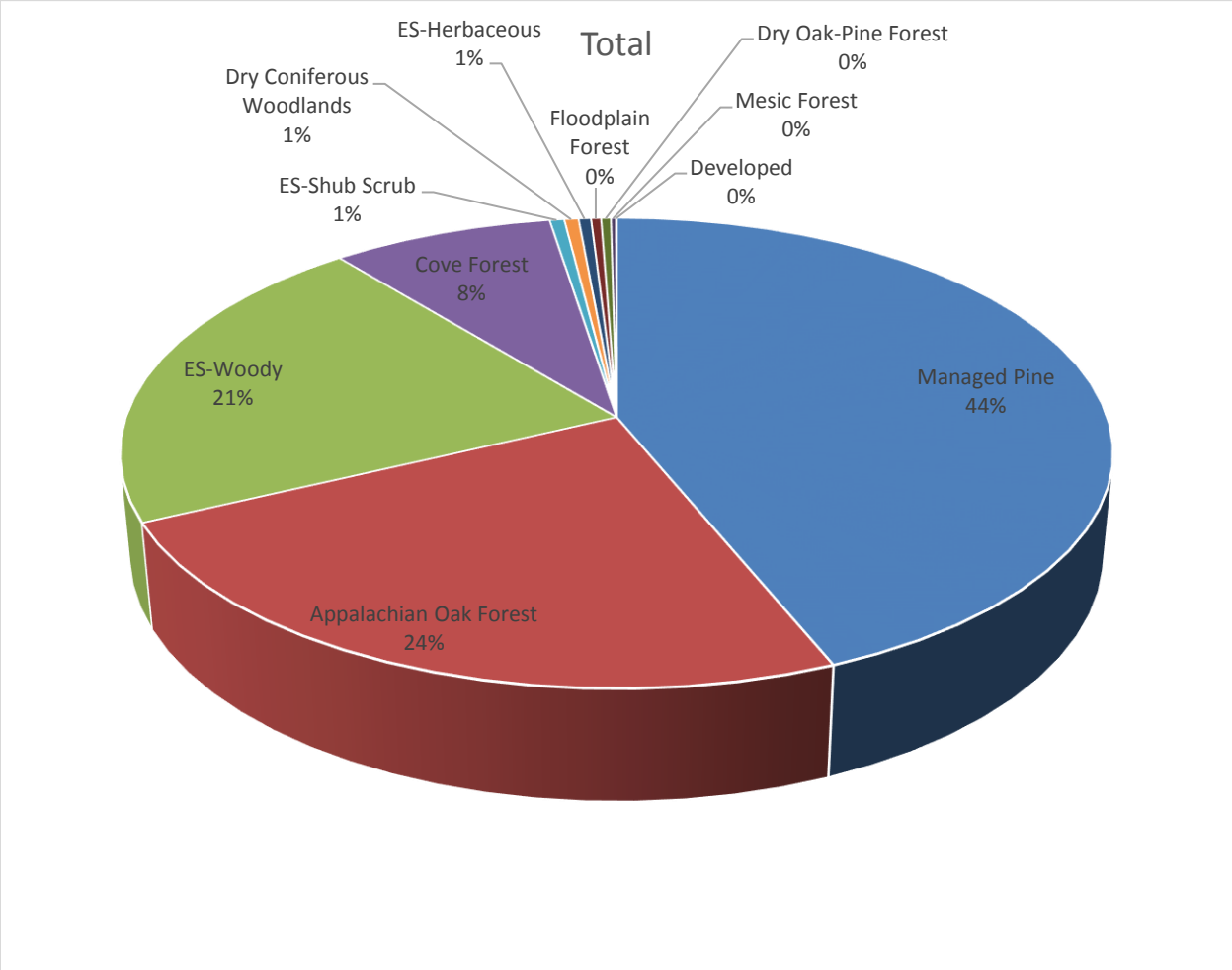
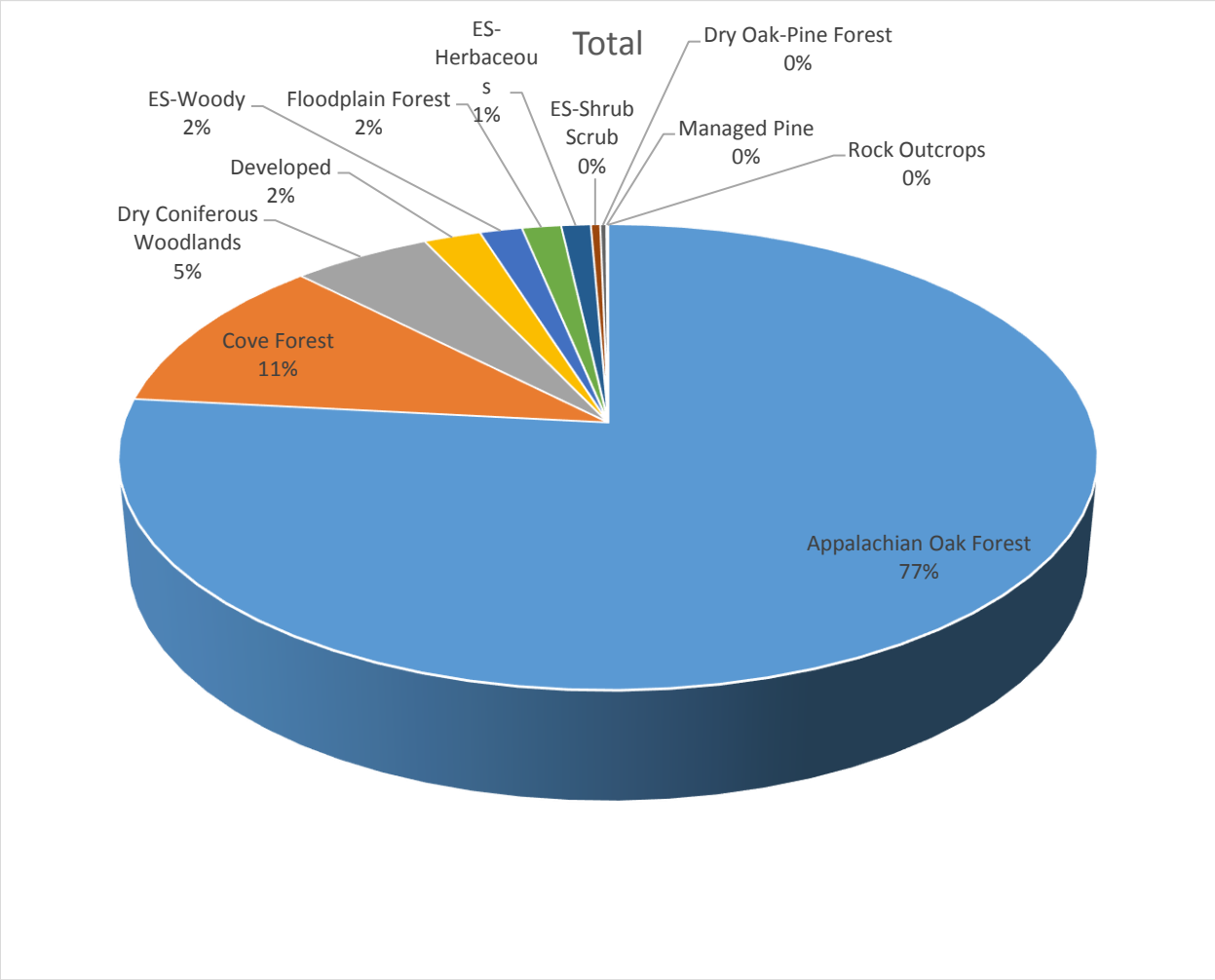
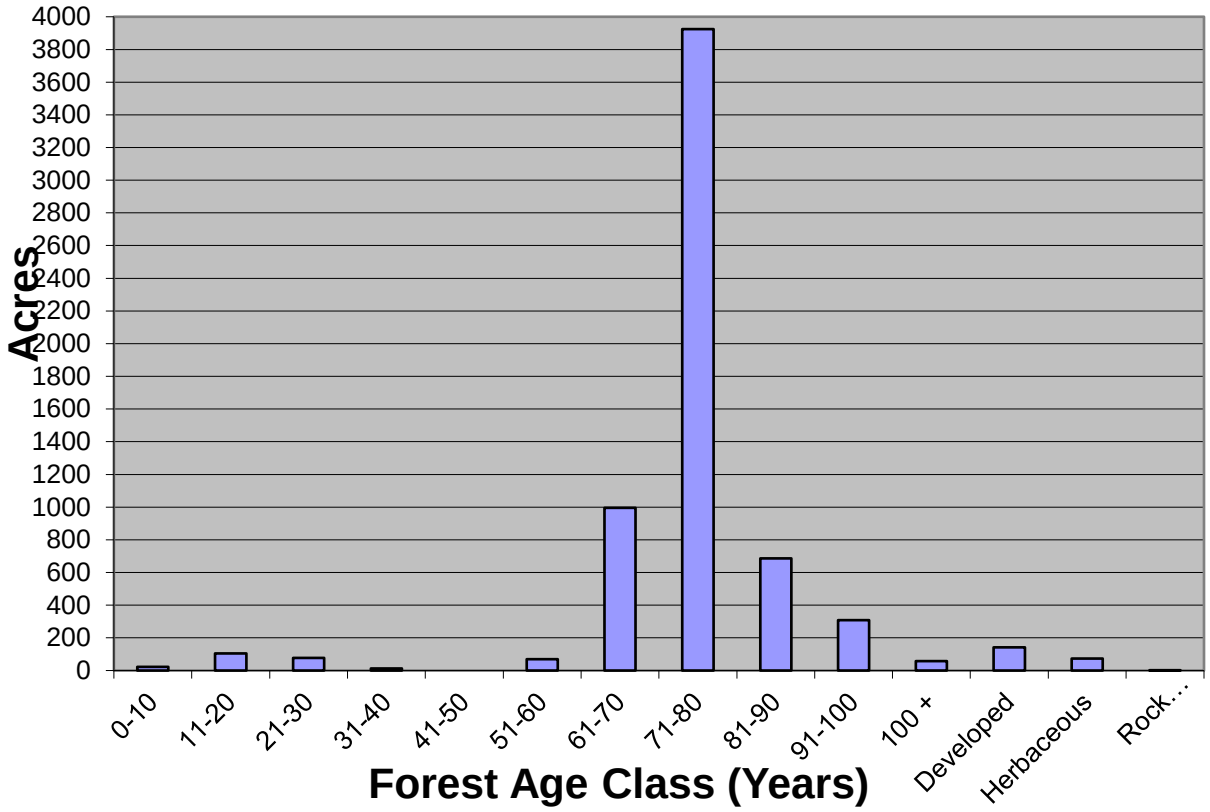


Figure 3: Forest Land Class/Types on TCGL (N.C. State University 2008).



There is a forest inventory with a digitized stand map for TCGL and BCGL. This data is current for BCGL, however, this data is now dated and over 24 years old for TCGL. Regardless, based on the last complete forest inventory and updates made for this management plan, the age class distribution on TCGL is clumped between 61 and 90 years of age (see Figure 4 - Note that the data presented has been adjusted to reflect current year age of these forest stands as of 2016), which is typical for the Southern Appalachian Mountains and is similar to the age class distribution on BCGL. However, older growth stands on TCGL are generally limited as a result of extensive, severe wildfires in the early 1940's. Younger and early successional forests constitute a relatively small portion of both TCGL and BCGL. However, on MRGL, managed pine forests (planted pine stands) comprise 44% of the game land and these pine stands range from 15 to 20 years of age. The vast majority of these stands have not reached maturity but will do so within the next 15 to 20 years, providing numerous opportunities for restoration and conversion to more naturally occurring/native forest types.

Figure 4: Forest Age Class Distribution on Thurmond Chatham Game Land.



Site indexes (a measure of productivity) on these game lands are generally good but vary considerably with elevation and forest community. Lower productivity and poorer site indexes tend to occur on the rocky ridges, thin soils, and drier sites, whereas higher productivity and better site indexes tend to occur within the rich, mesic forests, and cove forest stands. All of these game lands are in need of updated forest inventories and stand maps.

Forest Resource Needs

Given the high percentage of oak forest on BCGL and TCGL, and their importance as mast (acorn) producers to a variety of wildlife species, oak and oak/pine forests have and will continue to be a primary focus of forest management across these game lands. Threats to oak forests from pathogens, inadequate advanced oak regeneration, and invasive species create the need for continual forest management practices to be implemented in these systems. 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 will be needed to promote healthy and diverse oak forests. Similarly, but to a lesser extent due to the fewer oak stands, MRGL will receive a similar focus for oak stands that are accessible and operable for similar treatments.

There is a need to change pine monoculture/plantation conditions on MRGL to more diverse mixed pine-hardwood stands to improve wildlife habitat across the game land 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. Prescribed burning is currently being used extensively in these stands on MRGL, with more growing season burns being introduced to accelerate improvement of habitat conditions in these stands. Planting of shortleaf pines and oaks for restoration and some herbicide use may be employed where needed to develop pine-oak stands on all 3 game lands.

Dry oak/pine/coniferous forests and woodlands will also be a focus of forest management due to the gradual loss of table mountain pine forests across the landscape, resulting primarily from the historical lack of disturbance needed to promote them, devastating losses of stands over the last decade from infestations of southern pine beetle, and the conversion of many sites to managed pine forests. For the same reasons, shortleaf pine communities have declined significantly over the last 100 years, and efforts to promote restoration of this important forest community is currently a priority for management across the mountain region. As with oak forests, timber harvests (primarily shelter-wood cutting and/or thinning), herbicide use (to control competition with other regeneration), mechanical release, prescribed burning (to enhance forest stand structure and promote reproduction), and some planting of shortleaf pine seedlings will be needed to promote healthy and diverse dry oak/pine/coniferous forests and woodlands.

As mentioned, there is also an immediate need to conduct accurate forest resources inventories and stand maps for MRGL and TCGL. This will provide important information for planning and directing forestry and wildlife habitat management. Additionally, opportunities for forest management and wildlife habitat research, including prescribed fire, oak regeneration, shortleaf and table mountain pine restoration, should continue to be encouraged on these game lands.

Timber Harvest

Timber harvest is an integral silvicultural part of forest management on game lands. While there have been numerous NCWRC timber sales conducted on TCGL, no NCWRC timber sales have been implemented on BCGL or MRGL, although both of these game lands have areas that were harvested by the previous landowners. And, although timber harvest is an important forest management tool for restoration of native forest communities and developing and improving wildlife habitat, certain areas on these 3 game lands have limited operability for timber sales due to several factors such as inoperable terrain, lack of access, proximity to private lands, and Primary area and easement restrictions. However, recently completed road infrastructure projects have increased the potential for future timber harvests on many areas across these game lands, especially at BCGL. Future timber sales on all 3 game lands will continue to be driven by the need to create, improve, and manage wildlife habitat, achieve forest community restoration goals, and meet future game land management objectives.

Some general guidelines used for timber harvest across State owned game lands are listed below:

- 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.
- 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 across 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 Forestry Best Management Practices and all North Carolina Forest Practices Guidelines will be applied where applicable.

Tree Planting and Reforestation

Reforestation and tree planting occur on State owned game lands most commonly following timber sales, however instances of disease or pest outbreaks or natural disturbances such as wind are also cause for these activities to occur. Reforestation occurs in two forms which include artificial and natural regeneration. Natural regeneration has and will continue to be the preferred form of reforestation on game lands. Sites which are able to support regeneration of beneficial tree species and a diverse composition of species are generally allowed to regenerate naturally. Stands which previously consisted of monoculture managed pine or have uniform species composition prior to harvest are often sites in which artificial regeneration is used. In some instances, where the threat of competition from non-desirable vegetation is determined to be great, artificial regeneration methods may be used to allow desirable species a “head start” or advancement in their establishment and growth. Generally, clear-cut pine and mixed pine/hardwood stands that are planted back with pine (typically shortleaf pine) will occur on a wide spacing of 14 feet by 14 feet to encourage development of additional natural regeneration to a mixed pine/hardwood stand. These forests 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. 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. As seedling sources for

American chestnut and table mountain pine become available in the future, forest restoration projects will include planting of these tree species on these game lands as well.

Herbicide Treatments

Applications of herbicide for forest management are another tool that is implemented on State owned game lands. These practices are generally carried out through contracts with the North Carolina Forest Service in conjunction with both site preparation and/or tree planting services. The use of herbicide for forest management purposes is particularly important with regard to controlling a variety of non-native invasive species that are found on these game lands. Controlling invasive species is a critical component of habitat restoration and a pivotal step in ensuring the success of reforestation plantings following timber harvest and for management and restoration of native vegetation. Herbicide is also beneficial in helping to control competition with planted seedlings from fast growing tree species such as yellow poplar and maple following timber harvests. This allows desirable species such as oak, a slow growing species, opportunity to establish the site. Applications of herbicide to control competition are typically carried out following reforestation plantings to release seedlings and saplings, but in some instances may be implemented prior to timber harvest to promote advanced development of natural regeneration of desirable tree species such as oaks, hickory, persimmon, and others.

Herbicide treatment of invasive exotics in managed pine stand, MRGL.

Prescribed Burning

The use of prescribed fire is of primary importance for restoring and maintaining ecosystem and habitat diversity across these game lands. In conjunction with timber harvest, prescribed fire is one of the main tools used by NCWRC to manage game lands. Many of the habitats across these game lands, in particularly those that are the most degraded, require regular application of prescribed fire for propagation, enhancement, restoration, and maintenance. These include such habitats as oak and mountain yellow pine communities as well as the early successional habitats that are critical for wildlife across these game lands. Burning with prescribed fire also helps reduce hazardous forest fuel loads that have the potential to carry wildfire from or across the game land to surrounding public and private lands, houses, and developments.

Burning is also an important forest management tool for site preparation prior to regenerative forest plantings. Fire also serves as a means to reduce competition from less desirable tree species such as yellow poplar, white pine, and red maple as well to control excessive

establishment of mountain laurel and rhododendron. The use of fire also helps to control the spread and establishment of many of the non-native, invasive species that have proliferated.

NCWRC works with many cooperators such as federal agencies, private orginazations, land conservancies, universities, and researchers to plan, implement, and monitor prescribed burns. Burns are carefully planned and conducted with safety to the public, staff, wildlife, and surrounding property the primary focus. Sites for prescribed burns are carefully chosen based on need, access, and ability to contain the fire. Research and monitoring is implemented as part of the prescribed burning program to assess effects to the landscape and wildlife and to provide important information regarding environmental changes and needed objectives for future management.

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 for that unit. In stands which include timber harvest and 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.

Restored table mountain/pitch pine savannah resulting from repeated understory burns at TCGL

TCGL has the longest prescribed burning history of any game land in the mountain region. Understory burns by NCWRC were first initiated there in 1987. Currently TCGL has 12 rotational prescribed burning units totaling approximately 830 acres. MRGL has 26 rotational prescribed burning units totaling nearly 900 acres and BCGL has 5 rotational prescribed burning units totaling approximately 72 acres. Additional opportunities and needs for prescribed burning occur on other areas of these game lands and units will be combined and expanded over time.

Annual Forest Management Planning

Generally, an annual forest management plan will be developed for forestry and prescribed burning projects on these game lands as part of the overall annual planning process for game lands in the mountain region. Annual forest management planning will be directed by this management plan and will address specific wildlife-forestry projects, 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 the existing infrastructure at BCGL, MRGL, and TCGL were conducted by Division of Engineering and Lands Management staff in July and August of 2015. The infrastructure maps in Appendix 1 show current locations of existing public access roads, administrative access roads, parking areas, primitive camping areas, trails, and other items that are found on each game land. These maps also indicate locations for the infrastructure upgrades discussed below for each game land. The results of these assessments along with recommendations for maintenance and improvements are discussed by category below.

Road Assessment

Buffalo Cove Game Land, MRGL, and TCGL all have a good network of roads, which provide access to the interior and perimeter of these game lands. These roads were inspected by Engineering and Lands Management staff during July and August of 2015.

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

Existing Road Conditions

Some of the roads in BCGL are in need of improvement, while a few are in good condition. The roads in the best condition include the following:

- Cove Branch Road, Segment 1 (Public Access)

  The first section of this road extends from Cove Branch Road (S.R. 1557) to the existing parking lot/designated camping area in the eastern portion of the Mingo Tract. The road was recently upgraded to a one-lane gravel road. The road is in good condition and is passable by all traffic.

- Cove Branch Road, Segment 2 (Public Access)

  This road is a continuation of the road described above. It begins at a parking area/designated camping area and provides access to the northern portion of the Mingo Tract. The road was recently upgraded to provide a one-lane gravel road that is usable by all traffic.

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

- Eastern portion of public access through Little Mountain Tract

  This road provides access through the game land off of River Road (S.R. 1330). The portion of the road in good condition is from the intersection with River Road to the parking lot (approximately 1.9 miles). This is an existing one-lane gravel road and only needs routine maintenance and minor pothole repair.

- Public access to Saddle Mountain Tract

  A one-lane gravel road in good condition, which intersects with Mountain Lake Road (S.R.1481) is the only road that provides access to the Saddle Mountain Tract. The road is approximately 0.5 miles and leads to an existing parking lot.

The majority of the roads in TCGL are in need of improvement, while a few are in good condition. The roads in the best condition include the following:

- Bell Branch Road

  This road is located on the eastern portion of the game land and provides access from Longbottom Road (S.R. 1730). This is a one-lane gravel road in good condition and extends approximately 1.7 miles and ends at a gated administrative access road. At this time, no work is needed on this section of road.

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

Buffalo Cove Game Land has several high priority road upgrade needs. These include the following:

- Green Rock Road (Public Access)

  This road provides public access to the western portion of the Mingo Tract. It begins at an intersection with Buffalo Cove Road (S.R. 1504), goes up a steep slope, and ends at an existing parking lot. The steep section of this road is in poor condition and needs to be upgraded and paved. The remainder of the road only needs gravel. The entire 0.5 mile road section needs upgrade and will have an estimated cost of $80,000.

- Green Rock Road (Administrative Access)

  This road is the continuation of the Green Rock Road public access. It begins at the parking area and provides administrative access into the western portion of the Mingo Tract. The existing road is in fair condition and is dirt with no gravel. As this is the only access to this portion of the game land, it should be upgraded to a one-lane gravel road to provide improved, long term administrative access. There are also two existing hunter/pedestrian stream crossings just off of this road. Both of these crossings are unsafe and need to be improved. This would involve either installing a small pedestrian bridge or culvert in the stream.

  The section of road needing repair is approximately 1.4 miles and will have an estimated cost of $140,000. The two stream crossings have an estimated cost of $10,000 each.

The MRGL has a limited road network, with some roads in good condition. However, some road work is needed. Over the next ten years, the highest priority road upgrade projects are as follows:

- Administrative Access Road through Little Mountain Tract

  This segment of road provides access through the western portion of the game land. It begins at the end of the road listed above that is in good condition (at the existing parking lot) and connects to Haystack Road (S.R. 1328). This road has varying amounts of gravel cover with areas of severe erosion and grading problems. Major work is needed to restore this to a one lane graveled road in good condition.

  The section of road needing upgrade is from the existing public parking lot to the intersection with Haystack Road. This road is approximately 3.7 miles in length and will have an estimated upgrade cost of $555,000.

- Administrative Access Road through Little Mountain Tract – Safety Hazard

  There is a safety hazard along the road mentioned above, that needs immediate attention. This is located at the following coordinates: 36° 22' 24.56" N, 81° 11' 57.38" W. At this location, there is a vertical rock face along the south side of the road, and a steep drop off of the north side. The road at this point is extremely narrow and is not safe for vehicle passage. A portion of the vertical rock face needs to be blasted and removed in order to widen the road in this location. The road at this point should be a minimum of 10' wide, with a 2' shoulder before the drop off to the north.

  This road repair will have an estimated cost of $25,000.

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

- Disabled Access Road

  This road provides disabled access in the south-central portion of the game land. The road is in poor condition, with several areas of severe erosion. This road needs complete reconstruction and is the highest priority at TCGL.

  The section of road needing upgrade is from the intersection with Osborne Ridge Road to the intersection with Pike Creek Road. This road is approximately 1.8 miles long and will have an estimated upgrade cost of $360,000.

- Osborne Ridge Road

  Osborne Ridge Road provides public access through the central/western portion of the game land. It begins at the intersection of Longbottom Road (S.R. 1728) and continues in a general northwesterly direction approximately 2.4 miles to a gate. The road is in good condition but needs additional gravel for improved public use.

  The section of road needing upgrade is from the intersection with S.R. 1728 to the end of public access (intersection with Knob Road) and will have an estimated upgrade cost of $240,000.

- Spencer Ridge Road

  This road provides public access through the central portion of the game land. Spencer Ridge Road begins at an intersection with Osborne Ridge Road and continues approximately 1.0 miles in a northerly direction to the end of Pike Creek Road. The public portion of this road is currently in poor condition and needs substantial grading and gravel. The road should be improved to provide one-lane, gravel access for the public.

The section of road needing upgrade is from the intersection with Osborne Ridge Road to a gate that marks the end of public access. This road is approximately 1.0 mile in length and will have an estimated upgrade cost of $195,000.

Medium Priority

The above mentioned roads at BCGL, MRGL, and TCGL are the highest priority for repair over the next ten years, but are not the only roads in need of upgrade on these game lands.

Buffalo Cove Game Land has the following medium priority road needs:

- Administrative Access (east of parking area/designated camping area).

  This road begins at the parking lot/designated camping area at the end of Segment 1 of Cove Branch Road. It provides administrative access east of the parking lot and ends near the boundary to the northeast. It is currently a dirt/grass road in fair condition. It gets limited use but could be improved by adding a gravel surface.

  This road is approximately 1.7 miles and will have an estimated upgrade cost of $170,000.

- Administrative Access at end of public access

  This road begins at the parking lot at the end of Segment 2 of Cove Branch Road. It is a dirt/grass road in fair condition and should be upgraded with a gravel surface.

  This road is approximately 1.0 mile and will have an estimated upgrade cost of $100,000.

- Administrative Access off public access, north of inholding in Mingo Tract.

  This road intersects with Segment 2 of Cove Branch Road, approximately 1.1 miles west of the parking lot/designated camping area. This road provides administrative access along the northwestern property line of the tract. It is in poor condition and needs complete reconstruction to provide one-land, gravel access.

  This road is approximately 3.7 miles and will have an estimated upgrade cost of $740,000.

The following road at MRGL is considered medium priority and should be repaired after the high priority projects are completed.

- Hiking Trail/Administrative Access (Saddle Mountain Tract)

  This existing road is used as a hiking trail and for administrative access through the central portion of the Saddle Mountain Tract. It begins at the public parking lot and loops along the ridgeline. It is currently in fair condition with some gravel and needs repair of minor erosion problems.

  The section of road/trail needing repair is approximately 1.5 miles and will have an estimated cost of $150,000.

Thurman Chatham Game Land has the following medium priority road needs:

- Air Bellows Gap Road

  This road provides the only public access to D-Section. The road begins at the end of S.R. 1130, which is accessed from the Blue Ridge Parkway. It ends at a parking area and trail access to the game land. The existing road is in fair condition with some areas of severe erosion. The road should be graded and gravel should be added in the necessary areas.

  The section of road needing upgrade is approximately 0.60 miles and will have an estimated upgrade cost of $60,000.

  This road currently traverses Doughton Park (Blue Ridge Parkway) and Stone Mountain State Park. A land swap with these agencies to move this road to NCWRC allocated property is desirable.

- Joshua Creek Road

  This is the westernmost public access to TCGL, and provides access from Old N.C. 18 (S.R. 1729). The existing road is in fair condition and needs the addition of gravel. There are two fords near the end of this road that present a maintenance and safety concern for public access. Joshua Creek Road should be gated before the fords and public parking upgraded.

  The section of road needing upgrade is from S.R. 1729 to the future gate/parking area. This road is approximately 1.1 miles and will have an estimated upgrade cost of $110,000.

- Ridge Road

  This road currently begins at the end of Joshua Creek Road and provides administrative access through the western portion of the game land. The road is currently dirt/grass with no gravel. This road should be upgraded to a one-lane gravel surface.

  The section of road needing upgrade is from the new gate as described in 'Joshua Creek Road' above to the intersection with Knob Road. This road is approximately 1.3 miles and will have an estimated upgrade cost of $130,000.

- Knob Road

  Knob Road currently provides administrative access from the intersection of Upper Old Osborne Ridge Road to an existing fire break and field to the south. This road is poor condition, with the steepest section experiencing extreme erosion. The entire road should be reconstructed to provide a one-lane gravel road with proper drainage.

  The section of road needing upgrade is from intersection of Upper Old Osborne Ridge Road to the existing field. This road is approximately 0.3 miles and will have an estimated upgrade cost of $30,000.

- Upper Old Osborne Ridge Road (Northern Administrative Access)

  This road begins at the end of Osborne Ridge and provides administrative access to the northern boundary of TCGL. This is a one-lane dirt/grass road in fair condition. Gravel should be added to the road to provide an all-weather surface. One concern with this road is that it is built directly on a significant amount of bedrock.

  The section of road needing upgrade is from the end of Osborne Ridge Road to the northern property line. This road is approximately 1.0 miles and will have an estimated upgrade cost of $100,000.

- Lower Old Osborne Ridge Road (Southern Administrative Access)

  This road begins at a designated campground and continues in a northerly direction until it intersects with Osborne Ridge Road. This is a one-lane dirt/grass road in fair condition. Gravel should be added to the road to provide an all-weather surface. A foot bridge will be added near the campground to facilitate better foot access for game lands users. This bridge will cross a creek and will span approximately 25'.

  The section of road needing upgrade is approximately 0.9 miles and will have an estimated upgrade cost of $95,000. The new pedestrian bridge will have an estimated cost of $10,000.

- Upper Spencer Ridge Road (Administrative Access)

  This administrative access provides a connection between Spencer Ridge and Pike Creek Roads. Without this road, staff would have to use the disabled access road or leave the game land in order to travel between the western and central portions of the property. The road is currently dirt, with no gravel and in fair condition. Gravel should be added to improve the road and ensure connectivity within the game land.

  The entire 1.7 miles of road needs to be upgraded with an estimated cost of $170,000.

- Pike Creek Road (Eastern Public Access)

  Pike Creek Road provides public access through the central portion of the game land. It begins at Longbottom Road (S.R. 1728) and ends at a gate at the intersection with Upper Spencer Ridge Road. The existing road is in fair condition but could use additional gravel. This road also has seven bridges that provide vehicular access over streams. The second and fourth bridges from the intersection with Longbottom Road need to be replaced. Both bridges are low and need greater clearance over the existing streams.

  The section of road needing upgrade is approximately 1.6 miles and will have an estimated upgrade cost of $160,000 (for gravel). The two bridge replacement projects have an estimated cost of $75,000 each, for a total of $150,000.

  In addition to this road work, approximately 0.15 miles of Pike Creek Road crosses private property with no recorded easement. Any opportunities to purchase an easement across this private property or to make a fee simple purchase of the property should be pursued to ensure future public access to this portion of the game land.

- Bell Mountain Road

  This road provides administrative access between the central and eastern portions of the game land. It runs from the end Boundary Line Road to the intersection with Wingler Field Road. This road is in poor condition and needs complete reconstruction to provide a passable one-lane gravel surface.

  The section of road needing upgrade is approximately 2.2 miles and will have an estimated upgrade cost of $440,000.

Low Priority

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

- Administrative access to Gill Knob

  This road begins near the parking lot/designated camping area at the end of Segment 1 of Cove Branch Road and provides administrative access to the N.C. Forest Service

Helipad on Gill Knob. The road experiences minimal use but could be upgraded by the addition of gravel.

This road is approximately 1.0 miles and will have an estimated upgrade cost of $100,000.

- Fire break off Public Access through Mingo Tract

  This road is located off of Segment 2 of Cove Branch Road, approximately 0.75 miles north of the existing parking lot/designated camping area. The road is primarily used as a fire break and is currently in fair condition with a grass/dirt surface. It could be improved by adding gravel.

  This road is approximately 0.8 miles and will have an estimated upgrade cost of $80,000.

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

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

- Trail Access to D-Section

  The access to D-Section consists of a gravel road to a parking lot. From the parking lot, a trail provides walk in across Stone Mountain State Park to the game land. The trail is in good condition but could be improved by adding a gravel base. This will help the trail hold up better to erosion due to pedestrian traffic and rain.

  The trail is approximately 0.5 miles and will have an estimated upgrade cost of $25,000.

- Left Fork Joshua Creek Road

  This road provides administrative access to a wildlife habitat improvement near the western boundary of the game land. The road turns north off of Joshua Creek Road near the game land boundary. It is in fair condition but needs the addition of gravel to provide improved access for Agency staff.

  This road is approximately 0.4 miles and will have an estimated upgrade cost of $40,000.

- Joshua Knob Road

  This road turns south off of Joshua Creek Road approximately 0.3 miles into the game land. It provides administrative access to a wildlife habitat improvement near the southwestern boundary of the game land property. It experiences minimal use and is

currently in fair condition. Gravel can be added to this road to provide improved administrative access.

This road is approximately 0.3 miles and will have an estimated upgrade cost of $30,000.

- Old Joshua Creek Road

  This road provides administrative access from Ridge Road to the southwestern property line. The road extends through the game land, crosses private property, and eventually connects to Longbottom Road (S.R. 1728). The road experiences minimal use due to several fords and a washed out bridge. This road should be improved by adding gravel, replacing the bridge and installed better stream crossings. It would also be beneficial for NCWRC to acquire the private property adjacent S.R. 1728 or an easement to provide permanent access to the game land from this road.

  This road is approximately 0.8 miles and will have an estimated upgrade cost of $80,000. Improving the stream crossings and replacing the bridge would have an additional estimated cost of $100,000.

- Mervin's Road

  This road provides administrative access to the southwestern portion of the game land. It intersects with Osborne Ridge Road near its end. The road currently serves mainly as a fire break and experiences minimal use. This road would see increased use if a connection was constructed (see "New Road Construction" section) to Old Joshua Creek Road. This road should be improved to provide one-lane gravel access for administrative staff.

  This road is approximately 0.9 miles and will have an estimated upgrade cost of $90,000.

- Turkey Cove Road

  This road provides public access off of Pike Creek Road. The road is in fair condition and just needs the addition of some gravel.

  This road is approximately 1.1 miles and will have an estimated upgrade cost of $80,000. Improving the stream crossings and replacing the bridge would have an additional estimated cost of $120,000.

- Log House Road

  This road begins where it intersects with Turkey Cove Road. It provides public access towards the northern portion of the game land and to a stocked trout pond. The road is

currently in fair condition but is experiencing some minor erosion. It should be improved by adding gravel and minor grading.

This road is approximately 0.4 miles and will have an estimated upgrade cost of $50,000.

- Administrative Access off Wingler Field Road

  This road provides administrative access and ties into the intersection of Wingler Field Road and Bell Mountain Road. It provides access to a wildlife habitat improvement to the north. The road is in poor condition and needs complete reconstruction to provide a one-lane gravel road.

  This road is approximately 0.6 miles and will have an estimated upgrade cost of $120,000.

- Bell Branch Road (Administrative Access)

  The administrative access portion of this road begins at the end of the public access portion of Bell Branch Road. It provides access to a wildlife habitat improvement in the eastern portion of the game land. The road is in poor condition and needs complete reconstruction to provide a one-lane gravel road.

  This road is approximately 0.3 miles and will have an estimated upgrade cost of $60,000.

- Boundary Line Road

  This road provides public access from Bell Branch Road to a gate that marks the beginning Bell Mountain Road. The road is in fair condition and just needs the addition of gravel.

  This road is approximately 0.9 miles and will have an estimated upgrade cost of $90,000.

New Road Construction

There are no new roads proposed for either BCGL or MRGL.

There is one new road that should be constructed on TCGL

- Connection between Old Joshua Creek Road and Mervin's Road.

  This new road will provide administrative access between two existing roads and will increase efficiency in moving through the game land. This road will eliminate the need to travel 3 miles through the game land to get from Old Joshua Creek Road to Mervin's Road.

  The layout of this road will have to be determined with surveys and coordination with staff, but it is estimated that this road will be approximately 0.4 miles and will have an estimated upgrade cost of $80,000.

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.

Typical Road Maintenance Practices

- 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.

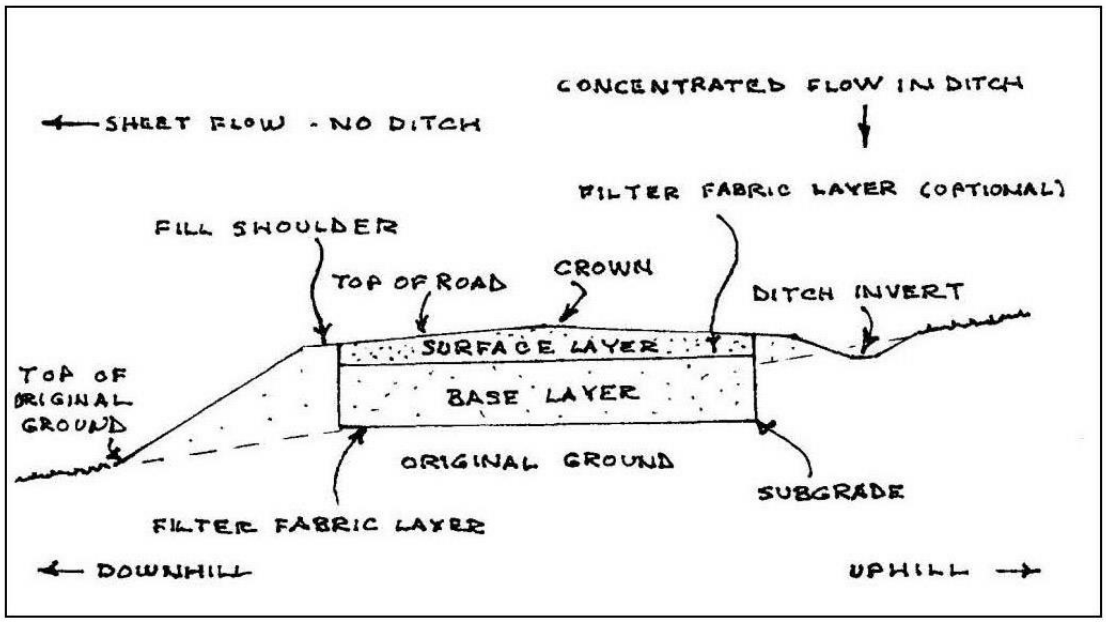


Figure 1 - Typical Road Cross-Section – Canaan, NH Highway Department

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 installed on game lands should the standard swing gate 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

Buffalo Cove Game Land has 4 designated parking lots serving the Mingo Tract and one serving the Long Ridge Tract. Existing parking area improvements include:

- Parking Lot at end of Cove Branch Road, Segment 1
  This parking lot is located at the end of the Cove Branch Road, Segment 1 and serves as the junction of additional public and administrative access. This parking lot is in good condition, but could use additional gravel. This improvement would cost approximately $1,000.

- Parking Lot at end of Cove Branch Road, Segment 2

  This parking lot is located at the end of the public access road through the Mingo Tract. This parking lot is in good condition but needs the addition of an information kiosk and game land map. This improvement would cost approximately $2,500.

- Parking Lot at end of Green Rock Road.

  This parking lot is located at the end of the public access section of Green Rock Road. This parking lot needs the addition of gravel. This improvement would cost approximately $2,000.

- Parking Lot serving Long Ridge Tract

  The Long Ridge Tract is currently accessed only by a trail just off of Old CC Road (S.R.1574). Property adjacent this road is privately owned and no public parking lot is provided, so users are forced to park along the side of the road. The Agency should attempt to acquire property adjoining the road to construct a parking lot. A new bridge crossing Joe's Creek should be constructed as well. The construction of this bridge would have an estimated cost of $10,000.

Mitchell River Game Land has 2 designated parking areas on the Little Mountain Tract and one on the Saddle Mountain Tract. Existing parking area improvements include:

- Parking Lot at end of public access through the Little Mountain Tract.

  This parking lot is at the end of the public access road and is in fair condition. Additional gravel should be added to improve the area. This improvement would cost approximately $5,000.

- Parking Lot at Haystack Road (S.R.1328) entrance.

  This parking lot is located just off of Haystack Road and provides access to the western portion of the Little Mountain Tract. The existing lot is in poor condition and needs additional grading and gravel. An information kiosk and game land map should also be added. This improvement would cost approximately $5,000.

- Parking Lot at Saddle Mountain Tract

  This parking lot is located at the end of the public access road that serves the tract. It is a small lot and should be made larger to provide parking for five vehicles. The lot needs the addition of gravel, as well as an information kiosk with game land map. This improvement would cost approximately $5,000.

In addition to the existing parking areas on MRGL, several new areas are needed:

- Parking Lot at entrance off River Road (S.R.1330)

  A parking lot is needed at this entrance to serve both hunters and other recreational users. This gravel parking lot should provide about five spaces for single vehicles and two horse trailers. This construction would require clearing, grading and the addition of gravel. This improvement would cost approximately $10,000.

- Future parking off NC-1462

  The property just northeast of the Saddle Mountain Tract may be acquired by NCWRC. If acquired, a parking lot should be added just off of S.R. 1462. This improvement would require clearing, grading, gravel and an information kiosk. This parking lot would cost approximately $15,000.

Thurman Chatham Game Land has 1 designated parking lot serving D-Section and 2 serving the main game land. Existing parking area improvements include:

- Parking Lot serving D-Section

  This parking lot is located at the end of the Air Bellows Gap access road serving the D-Section Tract. The parking lot is in fair condition and has an information kiosk. This parking lot only needs additional gravel. This improvement would cost approximately $3,000.

- Parking Lot at Osborne Ridge Road entrance

  This parking lot is located at the Osborne Ridge Road entrance, just off of Longbottom Road (S.R. 1728). It is a small parking area that that needs additional gravel and an information kiosk. This improvement would cost approximately $5,000.

- Parking Lot at Bell Branch Road entrance

  This parking lot is located at the Bell Branch Road entrance, just off of Longbottom Road (S.R. 1728). It is a small parking area that that needs additional gravel and an information kiosk. This improvement would cost approximately $5,000.

In addition to the existing parking areas on TCGL, several new areas are needed:

- Joshua Creek Road

  When Joshua Creek Road is improved, as previously described, a parking lot will need to be constructed. This parking lot will be at the end of the public access portion of Joshua Creek Road and before the future gate. This parking lot should provide parking for five vehicles and include an information kiosk. This improvement would require clearing, grading and the addition of gravel and would cost approximately $10,000.

Gates

Lockable gates are 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 these game lands are constructed of steel pipe with concealed locks and are in good condition. All gates installed on these game lands should the standard swing gate and 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

Buffalo Cove Game Land has one pond, which is located on the Mingo Tract. 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.

- Unnamed Pond – Administrative Access/Fire Break

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located near the northern property line of the Mingo Tract, off of an existing administrative access road/fire break. The GPS coordinates of the pond are: 36° 4’ 46.09” N, 81° 30’ 38.70” W. The dam consists of an earthen embankment and at the time of inspection, there was extensive vegetation and 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 currently has a riser/barrel outlet structure that appears to be operating correctly. A trash rack should be added to the top of the riser, as it has an 8” diameter and could clog easily. The pond does not currently have a spillway and water flows over a low point in the dam. An armored emergency spillway should be constructed to ensure the dam doesn’t experience a failure in the future.

Unnamed pond, Buffalo Cove Game Land.

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

Thurman Chatham Game Land has eight ponds. For the purpose of this assessment, the existing outlet works and dam embankments have been investigated to determine overall condition of the structures. Recommendations for maintenance and possible future construction needs have also been included.

- Unnamed Pond – Joshua Creek Road

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 game land, adjacent Joshua Creek Road. The GPS coordinates of the pond are: 36° 21’ 32.92” N, 81° 14’ 1.62” W. The dam consists of an earthen embankment, with the road being directly on the dam. At the time of inspection, there was extensive vegetation and 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 24” CMP outlet that sets the elevation of the pond (no riser box). The pond has no emergency spillway and during times of high flows, the water would overtop the dam and potentially cause erosion to the embankment. Ideally, a concrete riser would be added, as well as a concrete block emergency spillway, which can still allow vehicle passage.

- Unnamed Pond – Spencer Ridge Road

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the central portion of the game land, off of Spencer Ridge Road. The GPS coordinates of the pond are: 36° 22’ 4.84” N, 81° 12’ 18.98” W. The dam consists of an earthen embankment and at the time of inspection, there was extensive vegetation and 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 currently has no outlet structure or emergency spillway and water flows out through a low point in the dam. A new outlet structure and armored emergency spillway should be constructed to ensure the dam doesn’t experience a failure in the future.

- Unnamed Pond – Pike Creek Road

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the central portion of the game land, off of Pike Creek Road. The GPS coordinates of the pond are: 36° 22’ 8.82” N, 81° 11’ 26.90” W. The dam consists of an earthen embankment. At the time of inspection, there was extensive vegetation and 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 24” CMP outlet that sets the elevation of the pond (no riser box). The pond has no emergency spillway and during times of high flows, the water would overtop the dam and potentially cause erosion to the embankment. Ideally, a concrete riser would be added, as well as an armored emergency spillway.

- Log House Pond – Log House Road

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the central portion of the game land, off of Log House Road. Is it currently in the trout stocking program and listed as Hatchery Supported Water. The GPS coordinates of the pond are: 36° 22’ 44.05” N, 81° 11’ 30.98” W. The dam consists of an earthen embankment. At the time of inspection, there was extensive vegetation and 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 currently has no outlet structure or emergency spillway and water flows out through a low point in the dam. A new outlet structure and armored emergency spillway should be constructed to ensure the dam doesn't experience a failure in the future.

- Fallow Field Pond – Bell Branch Road (Southern Pond)

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the eastern portion of the game land, off of Bell Branch Road. Is it currently in the trout stocking program and listed as Hatchery Supported Water. The GPS coordinates of the pond are: 36° 22' 41.42" N, 81° 9' 56.65" W. The dam consists of an earthen embankment. At the time of inspection, there was extensive vegetation and 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 24" CMP outlet that sets the elevation of the pond (no riser box). The pond has no emergency spillway and during times of high flows, the water would overtop the dam and potentially cause erosion to the embankment. Ideally, a concrete riser and an armored emergency spillway should be added.

- Unnamed Pond – Bell Branch Road (Northern Pond)

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the eastern portion of the game land, off of Bell Branch Road. The GPS coordinates of the pond are: 36° 22' 46.68" N, 81° 10' 1.18" W. The dam consists of an earthen embankment. At the time of inspection, there was extensive vegetation and 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 24" CMP outlet that sets the elevation of the pond (no riser box). The pond has no emergency spillway and during times of high flows, the water would overtop the dam and potentially cause erosion to the embankment. Ideally, a concrete riser and an armored emergency spillway should be added.

- Upper Jim Cook Pond – Bell Branch Road (Administrative Access)

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the eastern portion of the game land, off of the administrative access portion of Bell Branch Road. The GPS coordinates of the pond are: 36° 22' 22.34" N, 81° 10' 23.60" W. The dam consists of an earthen embankment. At the time of inspection, there was extensive

vegetation and 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 currently has no outlet structure or emergency spillway and water flows out through a low point in the dam. A new outlet structure and armored emergency spillway should be constructed to ensure the dam doesn't experience a failure in the future.

- Boundary Line Pond – Boundary Line Road

This pond is not classified by Dam Safety and not shown in the NC Dam Safety Inventory. This pond is located in the eastern portion of the game land, adjacent Boundary Line Road. Is it currently in the trout stocking program and listed as Hatchery Supported Water. The GPS coordinates of the pond are: 36° 22' 15.93" N, 81° 9' 42.04" W. The dam consists of an earthen embankment, with the road being directly on the dam. At the time of inspection, there was extensive vegetation and 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 24" CMP outlet that sets the elevation of the pond (no riser box). The pond has no emergency spillway and during times of high flows, the water would overtop the dam and potentially cause erosion to the embankment. Ideally, a concrete riser would be added, as well as a concrete block emergency spillway, which can still allow vehicle passage.

Impoundments

Mitchell River, Thurman Chatham nor Buffalo Cove Game Lands have impoundments that require inspection for this management plan.

Dam and 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.

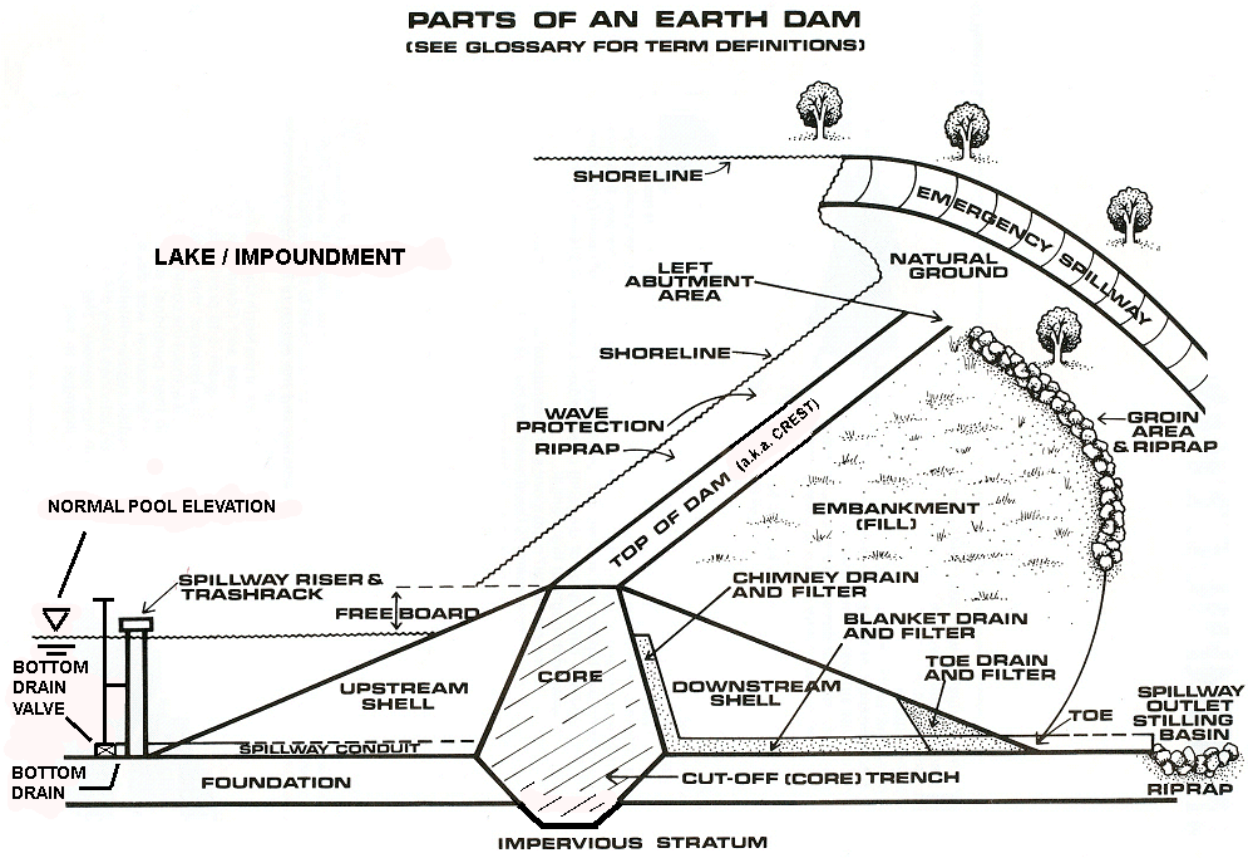


Figure 2 – Parts of an Earthen Dam (from Dam, Operation, Maintenance, and Inspection Manual – NCDENR Land Quality Section)

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 lusher 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 stormwater 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

Buffalo Cove Game Land has many culverts but none were identified as needing replacement or improvement.

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

- Large culvert - Fire Break/Administrative Access

  This pipe is located along a fire break/administrative access in the Little Mountain Tract. The pipe is located at the following GPS coordinates: 36° 25' 11.60" N, 80° 52' 34.20" W. Existing is a 42" CMP culvert which is too short, with eroding banks. This crossing should be improved by adding wing walls or rip rap on both the upstream and downstream slopes of the pipe. The estimated cost of this upgrade would be $1,000 for rip rap or approximately $5,000 for the wing walls.

Thurman Chatham Game Land has many culverts, and the following were identified as needing replacement or installation.

- Culvert at eastern Pike Creek Road

  There is an existing CMP culvert located at the following GPS coordinates: 36° 22' 24.56" N, 81° 11' 57.38" W. The culvert is too short and the side slopes are steep and eroded. Concrete wing walls should be constructed in order to prevent further erosion and protect the road from failure. The estimated cost of this improvement is $5,000.

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

Opportunities for public recreation are available at BCGL, MRGL, and TCGL. This section will review existing recreation facilities and identify sites for potential new development.

Boating Access Areas

There are no opportunities to provide boating access (motorboat or canoe/kayak) on BCGL, MRGL, and TCGL due to lack of navigable waters on these properties.

Public Fishing Areas

There are currently no public fishing areas located on BCGL, MRGL, or TCGL. Mitchell River and Buffalo Cove have no opportunities to add PFA's.

Thurman Chatham has eight ponds located throughout the game land, with 3 of them stocked with trout. These 3 ponds in particular should be investigated for the future construction of a bank or floating fishing pier. If suitable locations can be identified, a bank pier would cost approximately $10,000 and floating piers would cost $25,000.

Shooting Ranges

None of these three game lands currently have any shooting ranges. However, property was recently purchased as an addition to TCGL that may provide opportunity for constructing a shooting range. This shooting range would have a 100-yard rifle range and a 25-yard pistol range. If constructed, the TCGL Shooting Range will serve the area including MRGL and BCGL, therefore no other potential range locations have been investigated.

Hiking

The Saddle Mountain Tract of MRGL contains the 2.0 mile Saddle Mountain Loop Trail that extends to the top of Saddle Mountain and offers excellent views to the south and east.

While BCGL and TCGL have no designated hiking trails, an extensive network of administrative access roads, fire breaks, and old woods roads are available to and used by hikers

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 5.7 mile designated horseback riding trail is located on the Little Mountain Tract of MRGL. The Basin Creek Designated Camping Area at TCGL provides horseback riders utilizing the adjacent horse trail on Doughton Park (Blue Ridge Parkway) a location for overnight stay as well as an area for day users to park and unload. This amenity is not provided by the Blue Ridge Parkway on their property. Due to a lack of graveled roads of sufficient length to accommodate horseback riding, no designated riding trails are provided on BCGL.

Camping

Buffalo Cove Game Land currently has one designated primitive camping area. It is located at the parking lot at the end of Cove Branch Road, Segment 1. This is a primitive camping area with no amenities, and is currently used mostly by hunters.

There are currently no designated campsites located at MRGL.

Thurman Chatham Game Land currently has 2 designated primitive camping areas. One is located near the Osborne Ridge Road entrance and is currently used mostly by hunters. The Basin Creek Camping Area is located on a 7 acre tract of the game land. It is adjacent Longbottom Road (S.R. 1730) where Basin Creek crosses the highway and mainly serves

horseback riders and recreational campers. Both of these are primitive camping areas with no amenities provided.

As with hiking, camping is a very popular activity throughout the state. Additional areas for camping areas should be investigated on all 3 game lands. Any future camping areas will be unimproved and be used by both hunters and recreational 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 3).

A public input meeting regarding the use and management of BCGL, MRGL, and TCGL was held in Wilkesboro on 8/25/15. The public was also given the opportunity to provide input regarding these game lands via email and a portal on the agency website (see Appendix 4). 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 BCGL, MRGL, and TCGL. 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 all three game lands. Any management strategies that encourage trapping should be implemented. Several access enhancements, based on public input and staff recommendations, are planned for these game lands (see Infrastructure section). Acquisition of properties or easements that provide entry to areas that are currently difficult to access should be pursued. Management strategies that continue to enhance disabled hunter opportunities will be pursued as well. A focus on active habitat management on BCGL, MRGL, and TCGL will ensure that adequate numbers of game species are present. Challenges to providing quality hunting and/or trapping include conflicts with other hunters/trappers and hikers as well maintaining adequate levels of game species to provide for reasonable hunter success rates.

Fishing

Both BCGL and TCGL offer opportunities for trout fishing. Buffalo Creek and Rockhouse Creek, which harbor brown and brook trout are classified as Wild Trout Waters and are the major fisheries on BCGL. Joshua and Lovelace Creeks contain both rainbow and brook trout and offer limited fishing opportunity for wild trout at TCGL. Pike Creek along with 3 small ponds are managed as Hatchery Supported Trout Waters on TCGL and are stocked annually in spring and early summer. There are no fishing opportunities on MRGL due to limited aquatic habitat. A limited number of streams and streams of adequate size is the main challenge to offering more fishing opportunity on all 3 game lands.

Wildlife Viewing

Wildlife viewing includes activities such as birding, wildlife photography, and general wildlife viewing. Wildlife viewers are considered a primary user group on BCGL, MRGL, and TCGL. Management strategies to increase the number of wildlife viewers that utilize these game lands should be implemented. Strategies to increase and enhance wildlife viewing opportunities include: directional signage along roads that provide access to these tracts, 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. Thurmond Chatham Game Land is part of the "N.C. Birding Trail" and NCWRC staff will explore opportunities to enhance this portion of the "Trail". NCWRC staff will also consider adding both BCGL and MRGL to the "N.C. Birding Trail". Involving birding groups with special projects will increase public awareness of opportunities these game lands provide. Infrastructure improvements needed to better facilitate this and other user groups are noted in the "Infrastructure" section 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 trails and near parking areas will be explored. The primary challenge to provide a quality wildlife viewing experience on these 3 game lands includes steep terrain and conflicts with other user groups.

Other Outdoor Recreation

Other than traditional uses, the most popular outdoor recreational pursuit on BCGL, MRGL, and TCGL is hiking. In addition, activities such as photography, mountain biking, horseback riding (MRGL only), and geocaching occur at lower levels on these game lands. All of these users are considered secondary users of the game land.

Hiking is a popular activity on BCGL, MRGL, and TCGL and occurs year-round. The Saddle Mountain Tract of MRGL offers a 2 mile designated hiking trail that leads to the top of Saddle Mountain. While BCGL and TCGL offer no designated hiking trails, hiking is encouraged with many gated access roads and old woods roads offering abundant opportunity. Specific requests from hikers were not received in the development of this management plan, however, the development of partnerships between hiking groups and NCWRC that allow for trail construction and/or maintenance is encouraged. The establishment of any new trails will 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 or other easement areas, 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.

Informational sign at the trailhead of the Saddle Mountain Loop Trail, Mitchell River Game Land.

Photographers utilize all three of these game lands. This activity can be enjoyed year round and is encouraged. Conflict between photographers and other game land users may occur, but conflicts are thought to be minimal.

Horseback riding on a 5.7 mile designated trail is allowed on MRGL from May 15 to August 31. The Basin Creek Designated Camping Area at TCGL provides horseback riders utilizing the adjacent horse trail on Doughton Park (Blue Ridge Parkway) a location for overnight stay as well as an area for day users to park. This amenity is not provided by the Blue Ridge Parkway on their property. A designated horseback riding trail is not offered on BCGL due to a lack of suitable roads (graveled) of sufficient length available there. No requests regarding horseback riding were received via public comment for BCGL, MRGL, or TCGL. At MRGL, 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. Additional opportunities for horseback riding in the area are found on the Pisgah National Forest, Doughton Park, and Stone Mountain State Park.

Mountain biking currently occurs on all three game lands, but only at low levels. The current level of mountain biking should be maintained and increased levels of mountain biking should not be encouraged on these game lands due to a lack of properly designed 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. Public comments received pertaining to mountain biking were minimal.

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 all three 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

- Initial non-game surveys that were conducted as part of acquisition of BCGL and MRGL
- Wintering golden eagle surveys (BCGL, MRGL, TCGL)
- Fire Learning Network forest restoration and fuels monitoring research, (TCGL, ongoing)
- Breeding songbird surveys (TCGL)
- Sportfish Survey Records (BCGL)
- Black bear bait station survey (BCGL, MRGL, TCGL)
- Forest Inventory and Stand Mapping (BCGL)
- Stream crossing inventory (culverts, bridges, etc.) (TCGL)
- Pond/Dam inventory (BCGL, TCGL)

Wildlife/Habitat Inventory and Monitoring Needs

White-tailed deer, black bear, and wild turkey are featured big game species on BCGL, MRGL and TCGL. 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 these 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.

We currently lack adequate information regarding small mammals (including bats), amphibians and reptiles on all 3 game lands. Songbird surveys are also lacking at BCGL and MRGL. General surveys to inventory and monitor these species and their habitats are warranted. Inventory and monitoring of nongame aquatic species and sportfish should be initiated and/or continue on all 3 game lands. 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.

It is important to monitor and control exotic invasive species that are present on all 3 game lands and to rapidly detect and eradicate new ones before they become entrenched. Enhanced monitoring of exotic invasive species is needed to identify problem areas and better guide control strategies and efforts.

Monitoring land use and community planning efforts adjacent BCGL, MRGL, and TCGL 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 game lands 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 with goals described in the “desired future conditions” subsections. Updated forest inventory and stand maps are needed for MRGL and TCGL. The overall management objective for all 3 game lands will 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 these game lands will continue to be on popular game species, WAP priority species including a diversity of songbirds, and threatened and endangered plants.

User Group Needs

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

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
- 5 Wildlife Diversity Biologists
- 10 Wildlife Enforcement Officers
- 1 Field Engineer
- 1 Temporary Technician

None of these staff are dedicated solely to BCGL, MRGL, or TCGL

Current Costs/Funding Needs

Current and future estimated expenditures (adjusted for projected inflation rate) for managing BCGL, MRGL, and TCGL through 2025 are presented in Tables 3-5 on the following pages.

Buffalo Cove 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	0.25	mi	$ 3,000	750	769	788	807	827	848	869	890	912	935	$ 8,395
H	Firebreaks	Maintain firebreaks	1.5	mi	$ 700	1050	1076	1103	1130	1158	1187	1216	1246	1277	1309	$ 11,753
H	Herbaceous Planting	Planting/Maintenance	14	ac	$ 200	2800	2869	2941	3014	3088	3165	3243	3324	3406	3491	$ 31,341
H	Vegetation Control	Invasive Plant Control	5	ea	$ 200	1000	1025	1050	1076	1103	1130	1158	1187	1217	1247	$ 11,193
H	Vegetation Control	Sprout Opening Dev./Maint.	2	ac	$ 500	1000	1025	1050	1076	1103	1130	1158	1187	1217	1247	$ 11,193
H	Vegetation Control	Prescribe burning	21	ac	$ 30	630	646	662	678	695	712	730	748	766	785	$ 7,052
															Subtotal	$ 80,926
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	Crossing Structures	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	6	ea	$ 500	3000	3074	3151	3229	3309	3391	3475	3561	3650	3740	$ 33,579
O & M	Public Use Facilities	Maintain camping areas	1	ea	$ 500	500	512	525	538	551	565	579	594	608	623	$ 5,597
O & M	Public Use Facilities	Maintain Kiosks	5	ea	$ 75	375	384	394	404	414	424	434	445	456	468	$ 4,197
O & M	Road and Trails	Maintain gates	3	gate	$ 150	450	461	473	484	496	509	521	534	547	561	$ 5,037
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	5	mi	$ 400	2000	2050	2100	2153	2206	2261	2317	2374	2433	2493	$ 22,386
															Subtotal	$ 216,307
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	Cove Branch Rd. (end of segment 1)	1	ea	$ 1,000								10496			$ 10,496
D	Parking Area Upgrade	Cove Branch Rd. (end of segment 2)	1	ea	$ 1,000								10496			$ 10,496
D	Parking Area Upgrade	Green Rock Rd. (end of public access)	1	ea	$ 2,000	2000										$ 2,000
D	Crossing Structure	Green Rock Rd. (near admin. access rd.)	2	ea	$ 10,000		10248									$ 10,248
D	Pedestrian Bridge	Long Ridge Tract	1	ea	$ 10,000					10248						$ 10,248
D	Public Use Facilities	Kiosk Installation	2	ea	$ 2,500		5124									$ 5,124
D	Road Upgrade	Green Rock Road (Public)	0.5	mi	$ 80,000	80,000										$ 80,000
D	Road Upgrade	Green Rock Road (Admin.)	1.4	mi	$ 140,000							143472				$ 143,472
D	Road Upgrade	Admin. Access Rd. (east of parking area)	1.7	mi	$ 170,000				182648							$ 182,648
D	Road Upgrade	Admin. Access Rd. (from end of public access)	1	mi.	$ 100,000					109920						$ 109,920
D	Road Upgrade	Admin. Access Rd. (northerly portion of GL)	3.7	mi	$ 740,000										831760	$ 831,760
D	Road Upgrade	Admin. Access Rd. (Gill Knob)	1	mi	$ 100,000							114880				$ 114,880
D	Road Upgrade	Admin. Access Rd. (road to pond)	0.8	mi	$ 80,000									93888		$ 93,888
															Subtotal	$ 1,571,940
														Grand Total		**$ 1,869,173**

Table 3. Estimated current and future expenditures for managing BCGL through 2028.

Mitchell 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	0.5	ac.	$ 3,500	1750	1793	1838	1883	1930	1978	2027	2077	2129	2182	$ 19,588
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	5	mi	$ 700	3500	3587	3676	3767	3860	3956	4054	4155	4258	4363	$ 39,176
H	Herbaceous Planting	Planting/Maintenance	5	ac	$ 200	1000	1025	1050	1076	1103	1130	1158	1187	1217	1247	$ 11,193
H	Vegetation Control	Invasive Plant Control	150	ea	$ 200	30000	30744	31506	32288	33089	33909	34750	35612	36495	37400	$ 335,793
H	Vegetation Control	Prescribe burning	230	ac	$ 30	6900	7071	7246	7426	7610	7799	7993	8191	8394	8602	$ 77,232
															Subtotal	$ 480,184
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	Crossing Structures	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	3	ea	$ 500	1500	1537	1575	1614	1654	1695	1738	1781	1825	1870	$ 16,790
O & M	Public Use Facilities	Maintain Kiosks	3	ea	$ 75	225	231	236	242	248	254	261	267	274	281	$ 2,518
O & M	Road and Trails	Maintain gates	1	gate	$ 150	150	154	158	161	165	170	174	178	182	187	$ 1,679
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	2	mi	$ 400	800	820	840	861	882	904	927	950	973	997	$ 8,954
															Subtotal	$ 175,452
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	Little Mtn. Tract	1	ea	$ 5,000								5,868			$ 5,868
D	Parking Area Upgrade	Haystack Rd.	1	ea	$ 5,000							5,744				$ 5,744
D	Parking Area Upgrade	Saddle Mtn. Tract	1	ea	$ 5,000						5,496					$ 5,496
D	Parking Area Construction	River Rd.	1	ea	$ 10,000		10,248									$ 10,248
D	Crossing Structure	Culvert Replacement (Little Mtn. Tract Firebreak)	1	ea	$ 5,000				5,372							$ 5,372
D	Safety Hazard	Widen narrow spot in Admin. Access Rd. (Little Mtn. Tract)	1	ea	$ 25,000		25,620									$ 25,620
D	Road Upgrade	Admin. Access Rd. (Little Mtn. Tract)	3.7	mi	$ 555,000									582,528		$ 582,528
D	Road Upgrade	Admin. Access Rd. (Saddle Mtn. Tract)	1.5	mi	$ 150,000										164,880	$ 164,880
															Subtotal	$ 805,756
														Grand Total		**$ 1,461,392**

Table 4. Estimated current and future expenditures for managing MRGL through 2028.

Thurmond Chatham 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 Clearin	Wildlife Opening Establishment	0.5	ac.	$ 3,500	1750	1793	1838	1883	1930	1978	2027	2077	2129	2182	$ 19,588
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	3	mi	$ 700	2100	2152	2205	2260	2316	2374	2433	2493	2555	2618	$ 23,506
H	Herbaceous Planting	Planting/Maintenance	59	ac	$ 200	11800	12093	12393	12700	13015	13338	13668	14007	14355	14711	$ 132,079
H	Nest Box Structures	Nest Box Maintenance	8	ea	$ 25	200	205	210	215	221	226	232	237	243	249	$ 2,239
H	Trees and Shrubs	Planting/Maintenance	35	ea	$ 6	210	215	221	226	232	237	243	249	255	262	$ 2,351
H	Vegetation Control	Invasive Plant Control	5	ea	$ 200	1000	1025	1050	1076	1103	1130	1158	1187	1217	1247	$ 11,193
H	Vegetation Control	Sprout Opening Dev./Maint.	2	ac	$ 500	1000	1025	1050	1076	1103	1130	1158	1187	1217	1247	$ 11,193
H	Vegetation Control	Prescribe burning	115	ac	$ 30	3450	3536	3623	3713	3805	3900	3996	4095	4197	4301	$ 38,616
															Subtotal	$ 237,965
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	Crossing Structures	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	4	ea	$ 500	2000	2050	2100	2153	2206	2261	2317	2374	2433	2493	$ 22,386
O & M	Public Use Facilities	Maintain camping areas	2	ea	$ 500	1000	1025	1050	1076	1103	1130	1158	1187	1217	1247	$ 11,193
O & M	Public Use Facilities	Maintain Kiosks	7	ea	$ 75	525	538	551	565	579	593	608	623	639	655	$ 5,876
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	Bridge Maintenance	2	ea	$ 1,000	2000	2050	2100	2153	2206	2261	2317	2374	2433	2493	$ 22,386
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	3	mi	$ 400	1200	1230	1260	1292	1324	1356	1390	1424	1460	1496	$ 13,432
															Subtotal	$ 581,762

Table 5. Estimated current and future expenditures for managingTCGL through 2028 (continued on next page).

Thurmond Chatham Game Land

Financial Summary of Activities

Development Activities

Project	Description	Activity		Unit	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	Air Bellows Gap Rd.	1	ea	$ 3,000		3,074									$ 3,074
D	Parking Area Upgrade	Osborne Ridge Road	1	ea	$ 5,000	5,000										$ 5,000
D	Parking Area Upgrade	Bell Branch Rd.	1	ea	$ 5,000		5,124									$ 5,124
D	Parking Area Constructi	Joshua Creek Rd.	1	ea	$ 10,000		10,248									$ 10,248
D	Crossing Structure	Culvert Replacement (Pike Creek Rd.)	1	ea	$ 5,000			5,248								$ 5,248
D	Crossing Structure	Bridge Replacement (Pike Creek Rd.)	2	ea	$ 75,000			157,440								$ 157,440
D	Crossing Structure	Bridge Replacement/Stream Crossing Improvement (Old Joshua Creek Rd.)	1	ea	$ 100,000								117,360			$ 117,360
D	Crossing Structure	Bridge Replacement/Stream Crossing Improvement (Turkey Cove Rd.)	1	ea	$ 120,000					128,928						$ 128,928
D	Pedestrian Bridge	Lower Old Osborne Ridge Rd.	1	ea.	$ 10,000	10,000										$ 10,000
D	Trails	Access Trail Upgrade	0.5	mi	$ 25,000										30,580	$ 30,580
D	Public Use Facilities	Kiosk Installation	3	ea	$ 2,500		7,686									$ 7,686
D	Road Upgrade	Disabled Access Road	1.8	mi	$ 360,000				368,928							$ 368,928
D	Road Upgrade	Osborne Ridge Road	2.4	mi	$ 240,000	240,000										$ 240,000
D	Road Upgrade	Spencer Ridge Rd.	1	mi	$ 195,000	195,000										$ 195,000
D	Road Upgrade	Air Bellows Gap Rd.	0.6	mi.	$ 60,000		61,488									$ 61,488
D	Road Upgrade	Joshua Creek Rd.	1.1	mi	$ 110,000		112,728									$ 112,728
D	Road Upgrade	Ridge Rd.	1.3	mi	$ 130,000					136,448						$ 136,448
D	Road Upgrade	Knob Rd.	0.3	mi	$ 30,000			31,448								$ 31,448
D	Road Upgrade	Upper Old Osborne Ridge Rd.	1	mi	$ 100,000								107,440			$ 107,440
D	Road Upgrade	Lower Old Osborne Ridge Rd.	0.9	mi	$ 95,000								102,068			$ 102,068
D	Road Upgrade	Upper Spencer Ridge Rd.	1.7	mi	$ 170,000								182,648			$ 182,648
D	Road Upgrade	Pike Creek Rd.	1.6	mi	$ 160,000				167,936							$ 167,936
D	Road Upgrade	Bell Mountain Rd.	2.2	mi	$ 440,000									472,736		$ 472,736
D	Road Upgrade	Left Fork Joshua Creek Rd.	0.4	mi	$ 40,000						44,960					$ 44,960
D	Road Upgrade	Joshua Knob Rd.	0.3	mi	$ 30,000						33,720					$ 33,720
D	Road Upgrade	Old Joshua Creek Rd.	0.8	mi	$ 80,000								93,888			$ 93,888
D	Road Upgrade	Mervin's Rd.	0.9	mi	$ 90,000										107,856	$ 107,856
D	Road Upgrade	Turkey Cove Rd.	1.1	mi	$ 80,000					85,952						$ 85,952
D	Road Upgrade	Log House Rd.	0.4	mi	$ 50,000					53,720						$ 53,720
D	Road Upgrade	Admin. Access from Wingler Field Rd.	0.6	mi	$ 120,000							137,856				$ 137,856
D	Road Upgrade	Bell Branch Rd. (Admin. Access)	0.3	mi	$ 60,000							68,928				$ 68,928
D	Road Upgrade	Boundary Line Rd.	0.9	mi	$ 90,000						101,160					$ 101,160
D	Road Construction	Connector Rd. (Old Joshua Creek Rd./Mervin's Rd.)	0.4	mi	$ 80,000										97,856	$ 97,856
															Subtotal	$ 3,485,452
														Grand Total		**$ 4,305,179**

Table 5. Estimated current and future expenditures for managing TCGL through 2028.

ACQUISITION PLAN

Any tracts that border BCGL, MRGL, and TCGL that are offered for sale to the State should be evaluated on an individual basis to determine their value as additions to the Game Lands Program. Higher priority tracts will include those that address a particular conservation need, offer additional public or administrative access to the tracts, or ones that dissolve inholdings or right-of-way easements that currently exist on these game lands. Tracts near, but not bordering these game lands that 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. Tracts that provide critical habitat for threatened or endangered species should be pursued also. It should be noted that NCWRC only acquires property from willing sellers and does not pursue property condemnation. Additional properties can only be acquired when sufficient funds are available for land acquisition.

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)
- Develop a statewide policy regarding the commercial use of game lands where NCWRC is the primary custodian.
- Unauthorized removal of protected species from the game lands

PARTNERSHIPS

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

- N.C. Department of Transportation
- National Park Service
- Conservation Trust for North Carolina
- Piedmont Land Conservancy
- Foothills Conservancy of N.C.
- The Conservation Fund
- The Nature Conservancy
- North Carolina Parks and Recreation
- Southern Blue Ridge Fire Learning Network
- North Carolina Forest Service
- Blue Ridge Resource Conservation and Development Council
- National Wild Turkey Federation
- Trout Unlimited
- Audubon Society, Carolina Birding Club
- Hiking Clubs
- Consortium of Appalachian Fire Managers and Scientists

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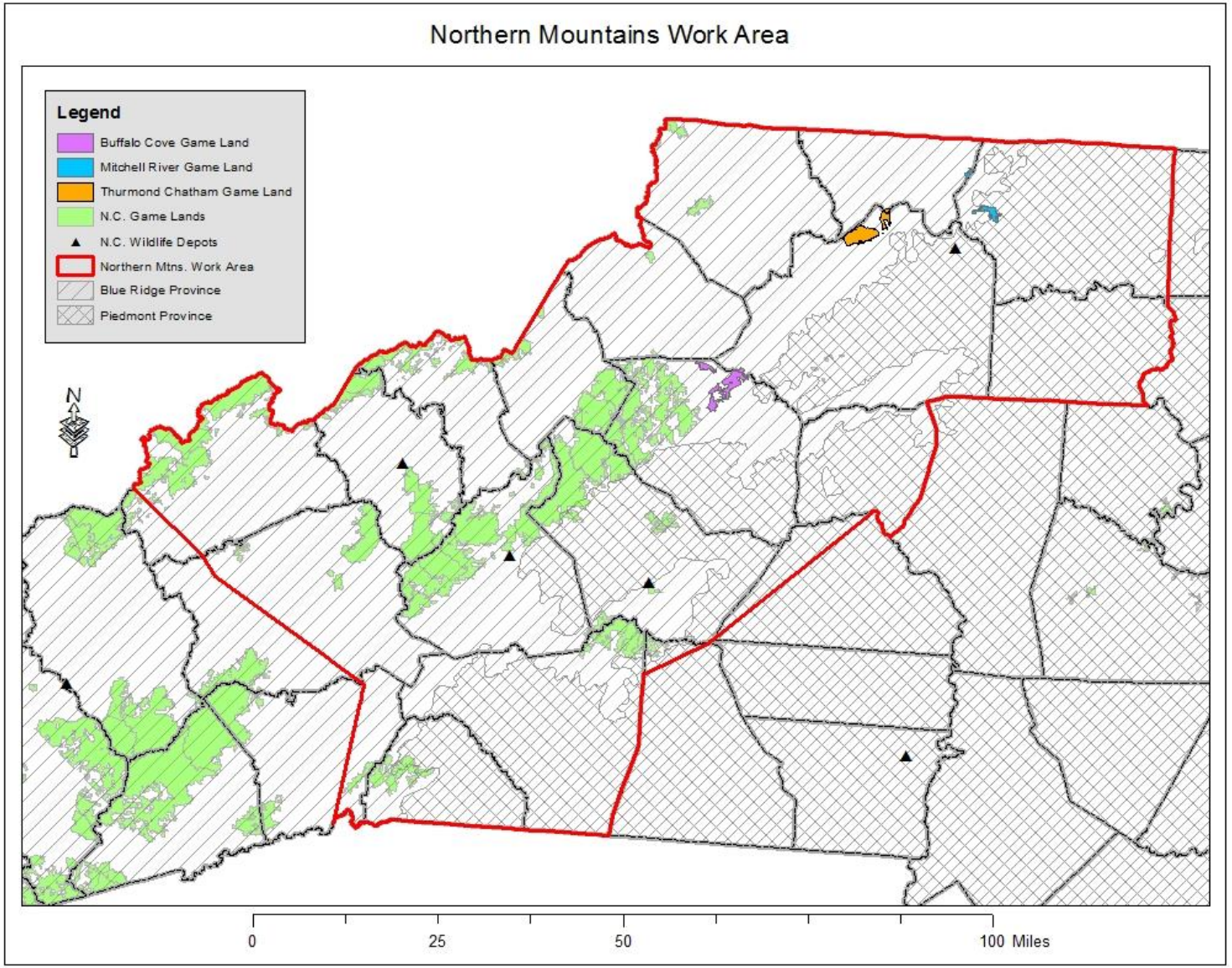
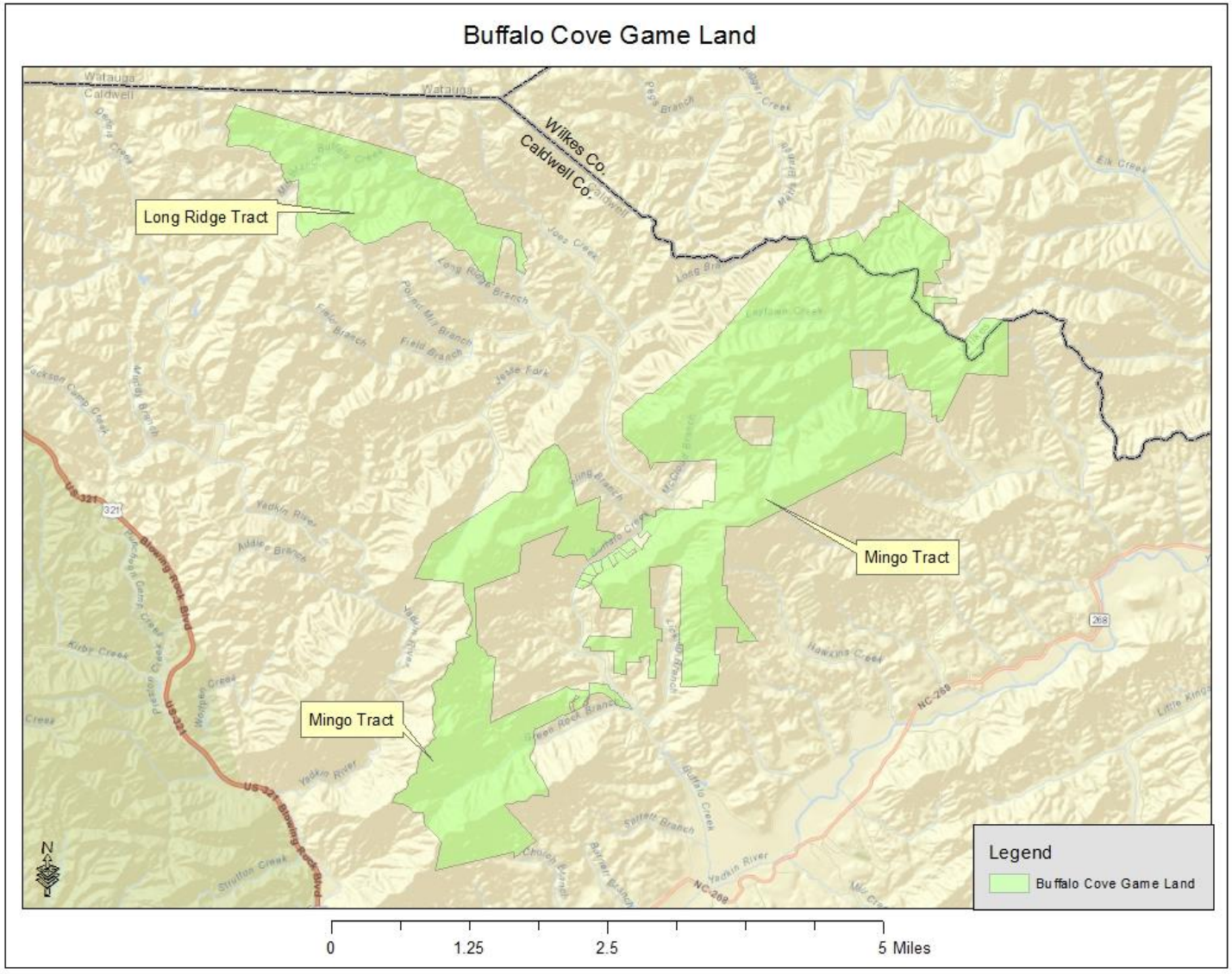
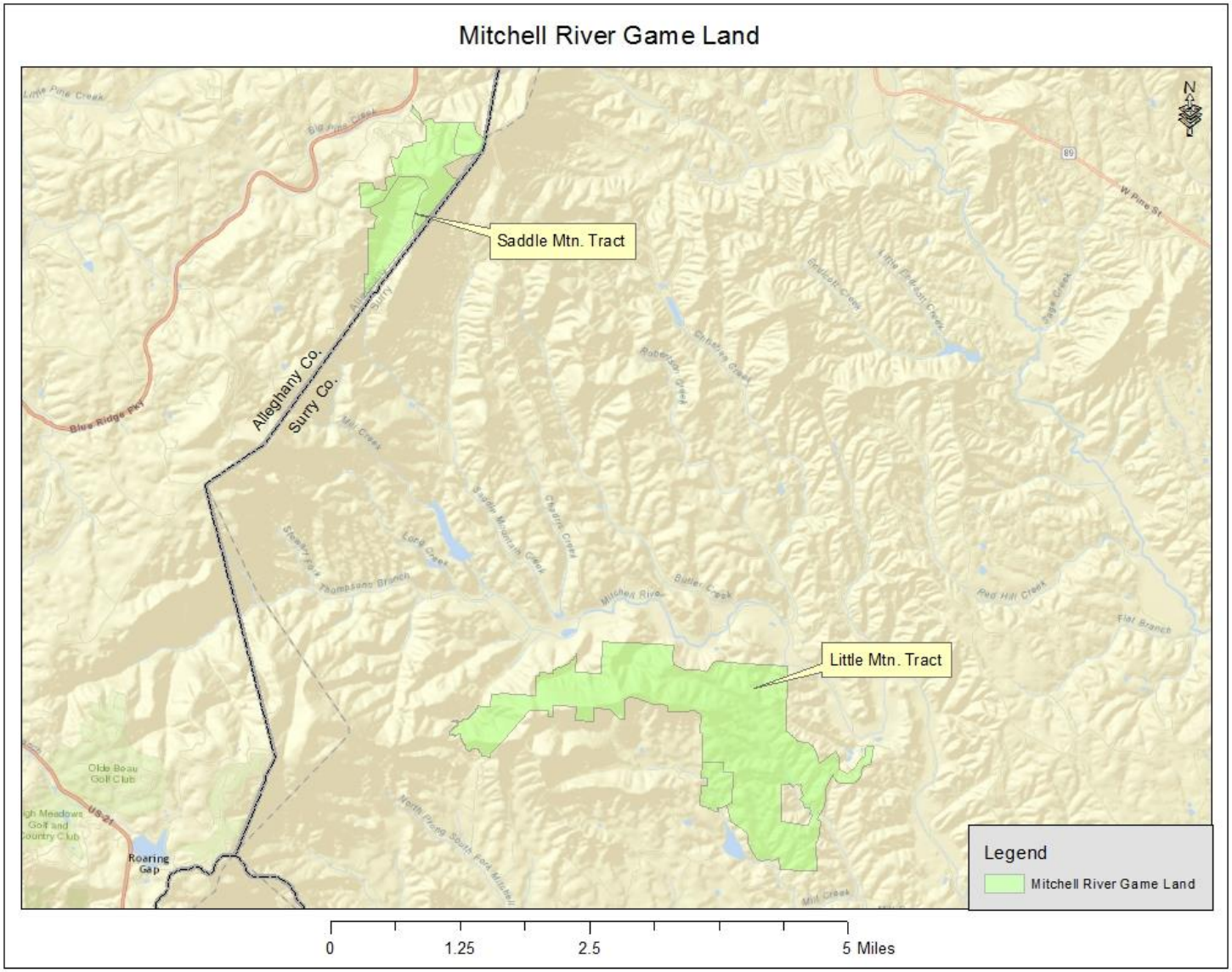
APPENDIX 1 – MAPS



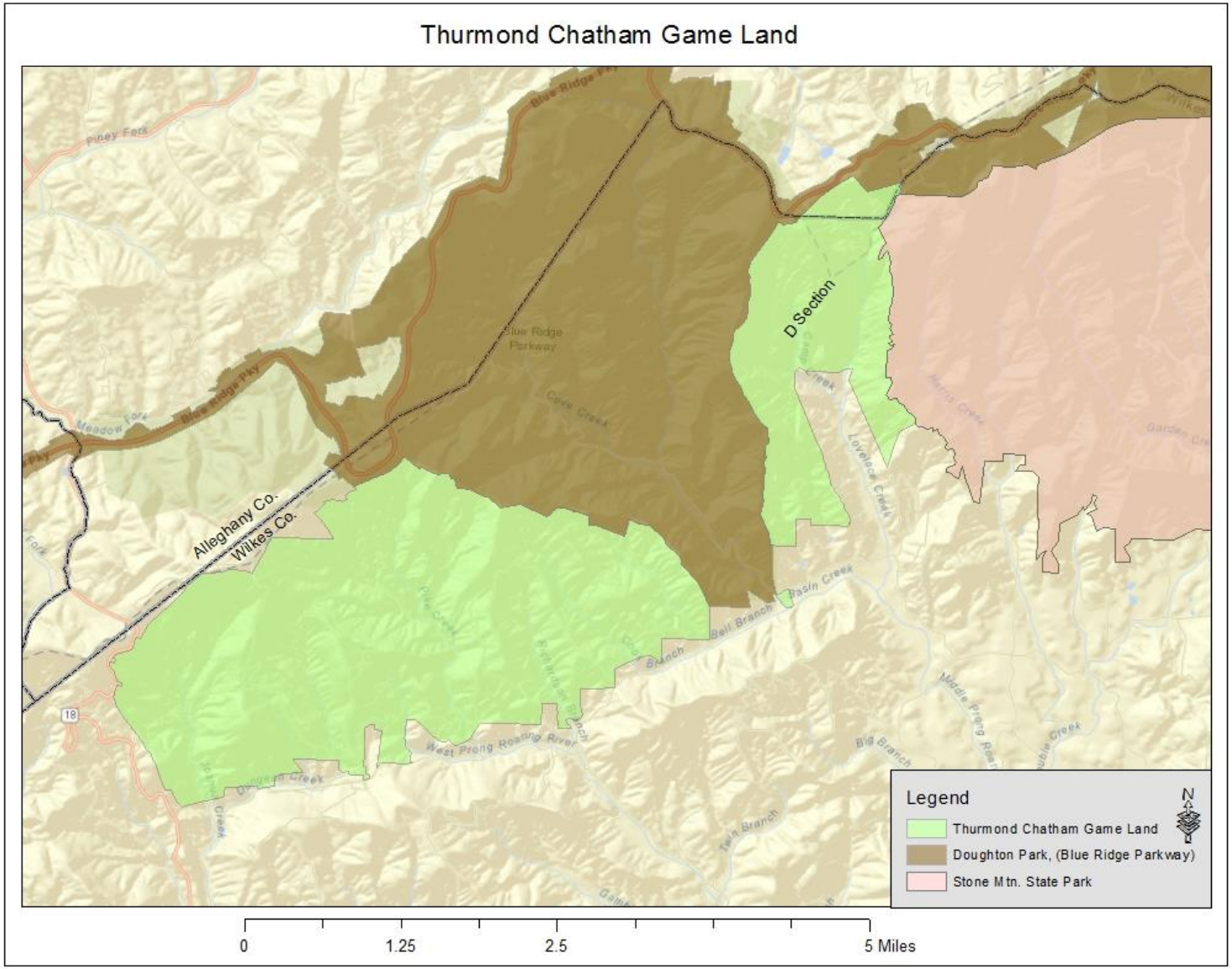
Map 1. Northern Mountains Work Area.



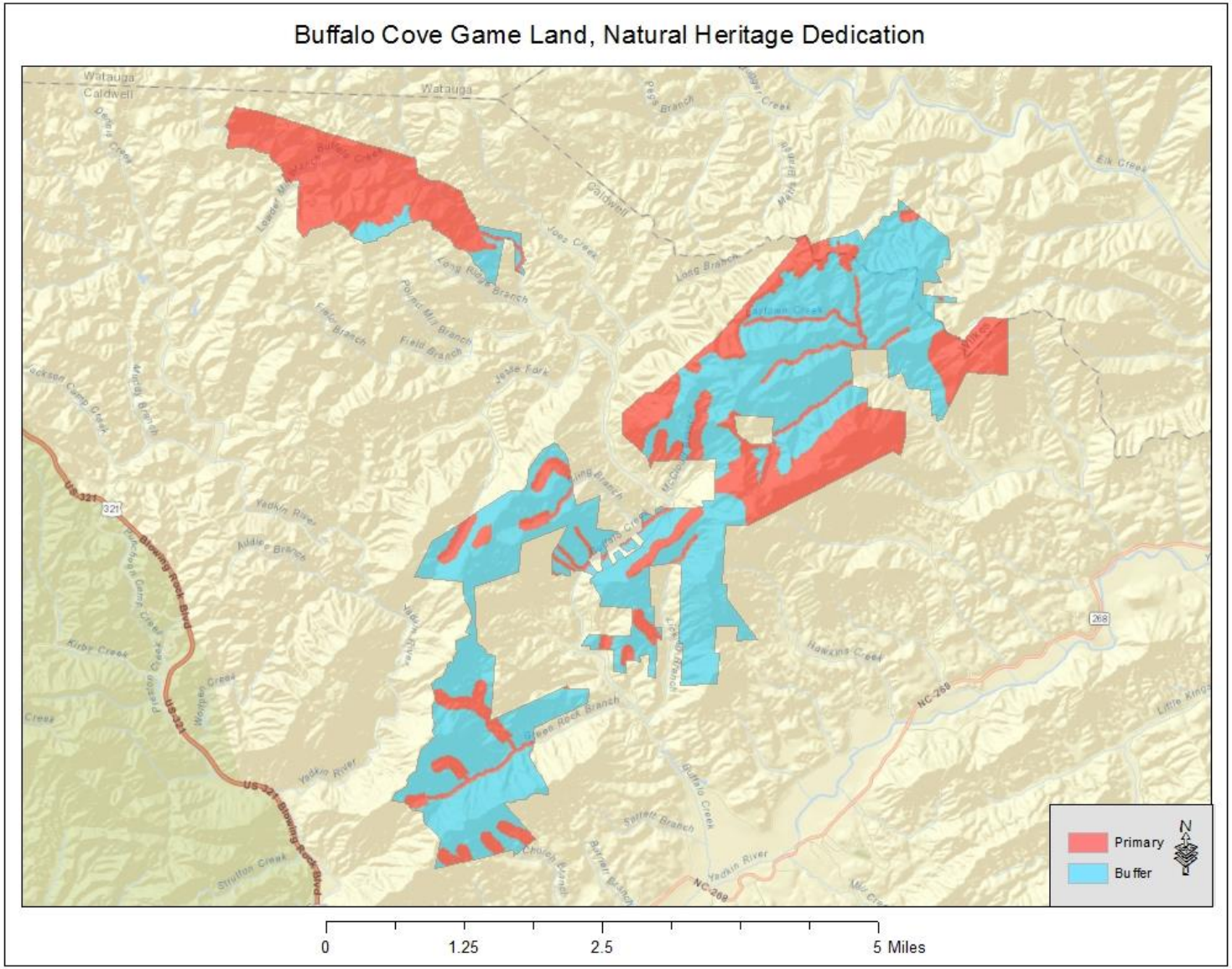
Map 2. Buffalo Cove Game Land.



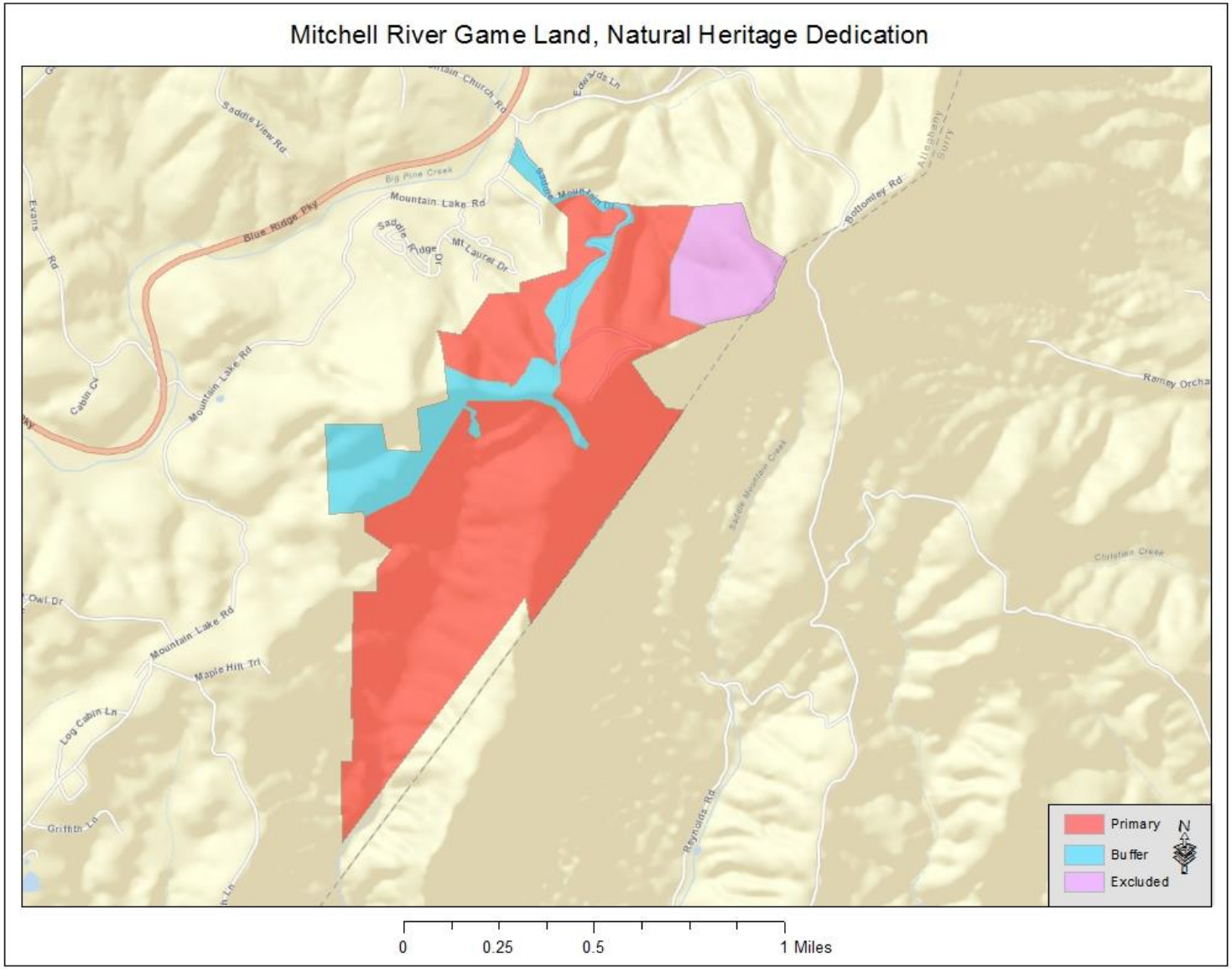
Map 3. Mitchell River Game Land.



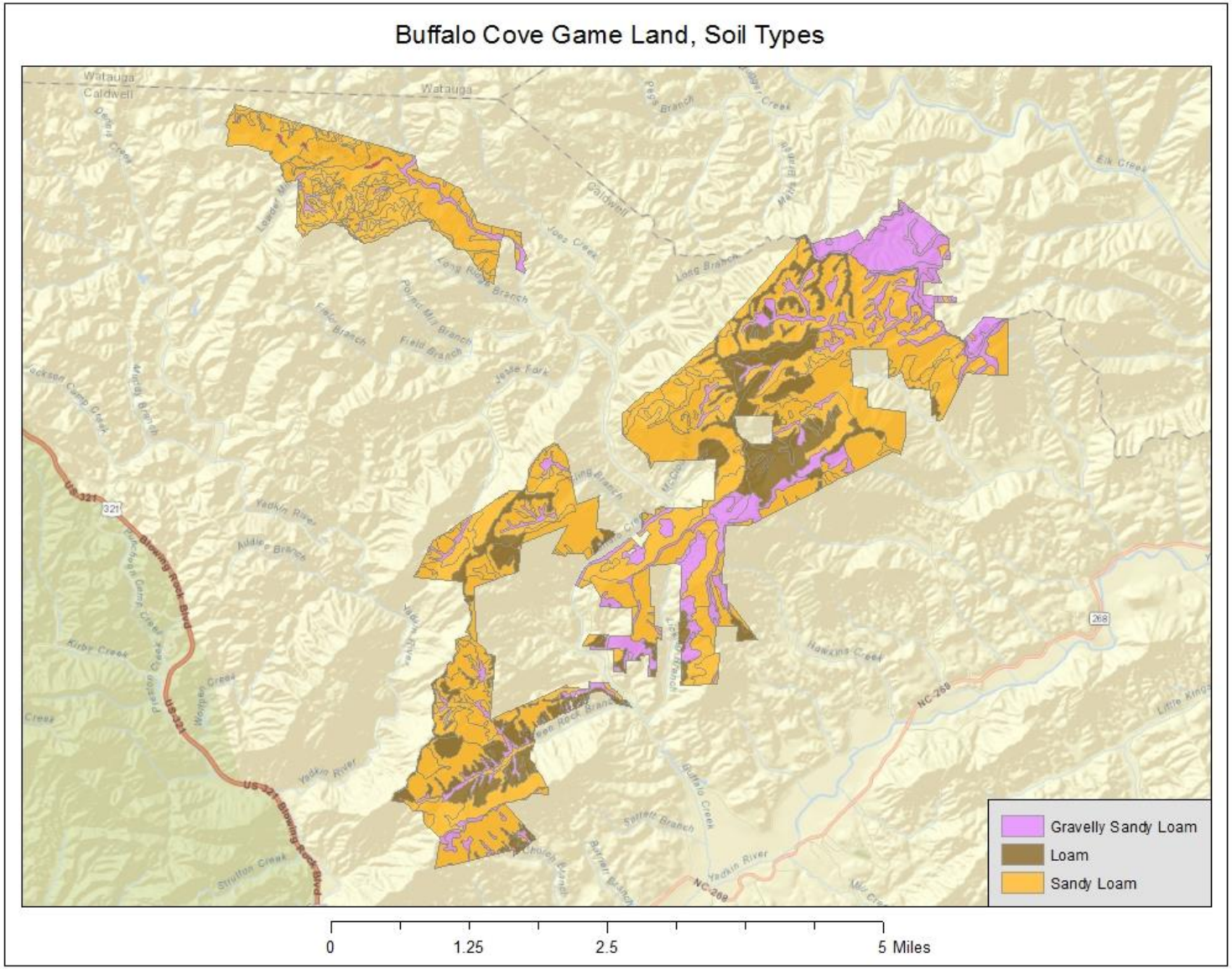
Map 4. Thurmond Chatham Game Land.



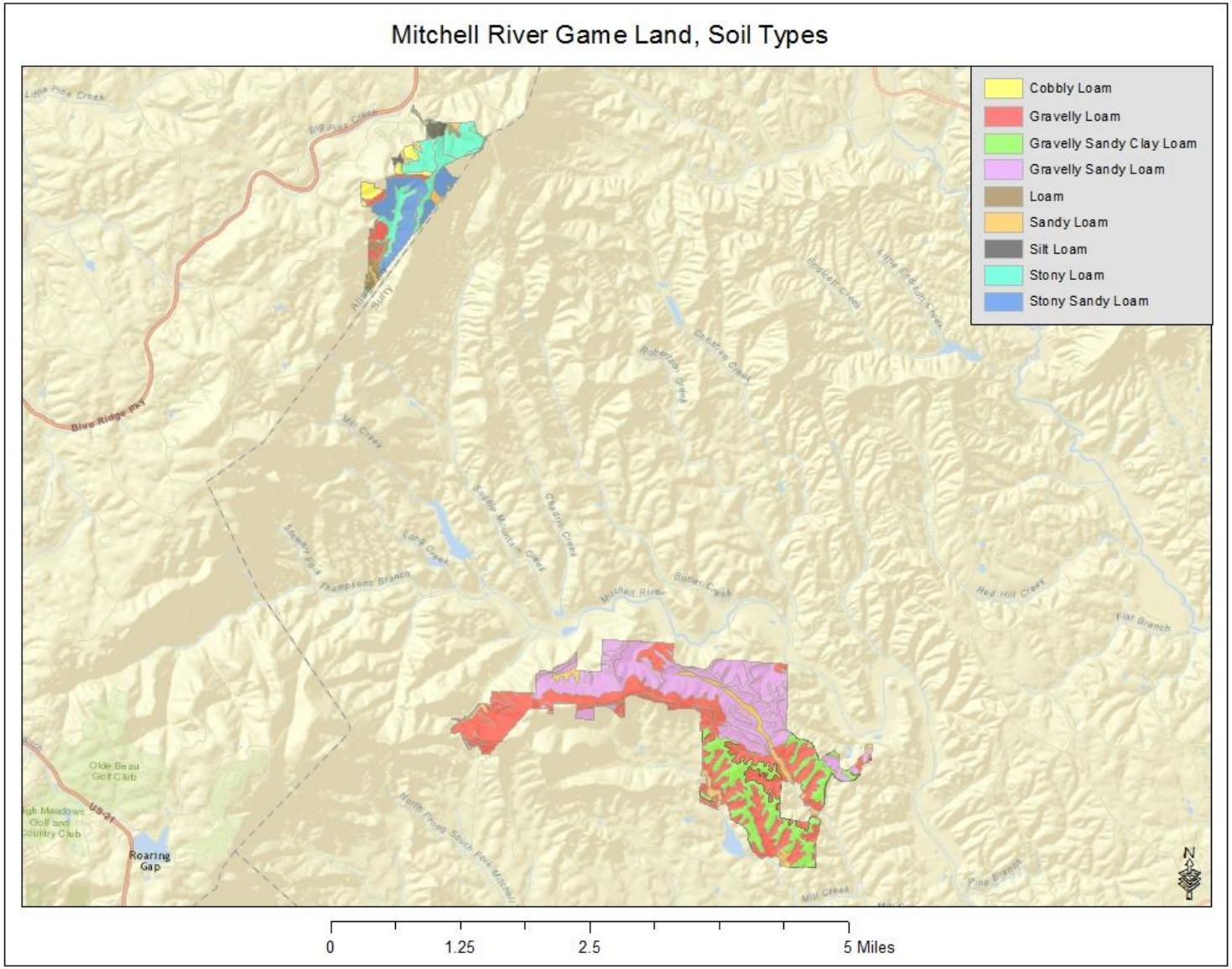
Map 5. Buffalo Cove Game Land, Natural Heritage Dedication (also see Appendix 2).



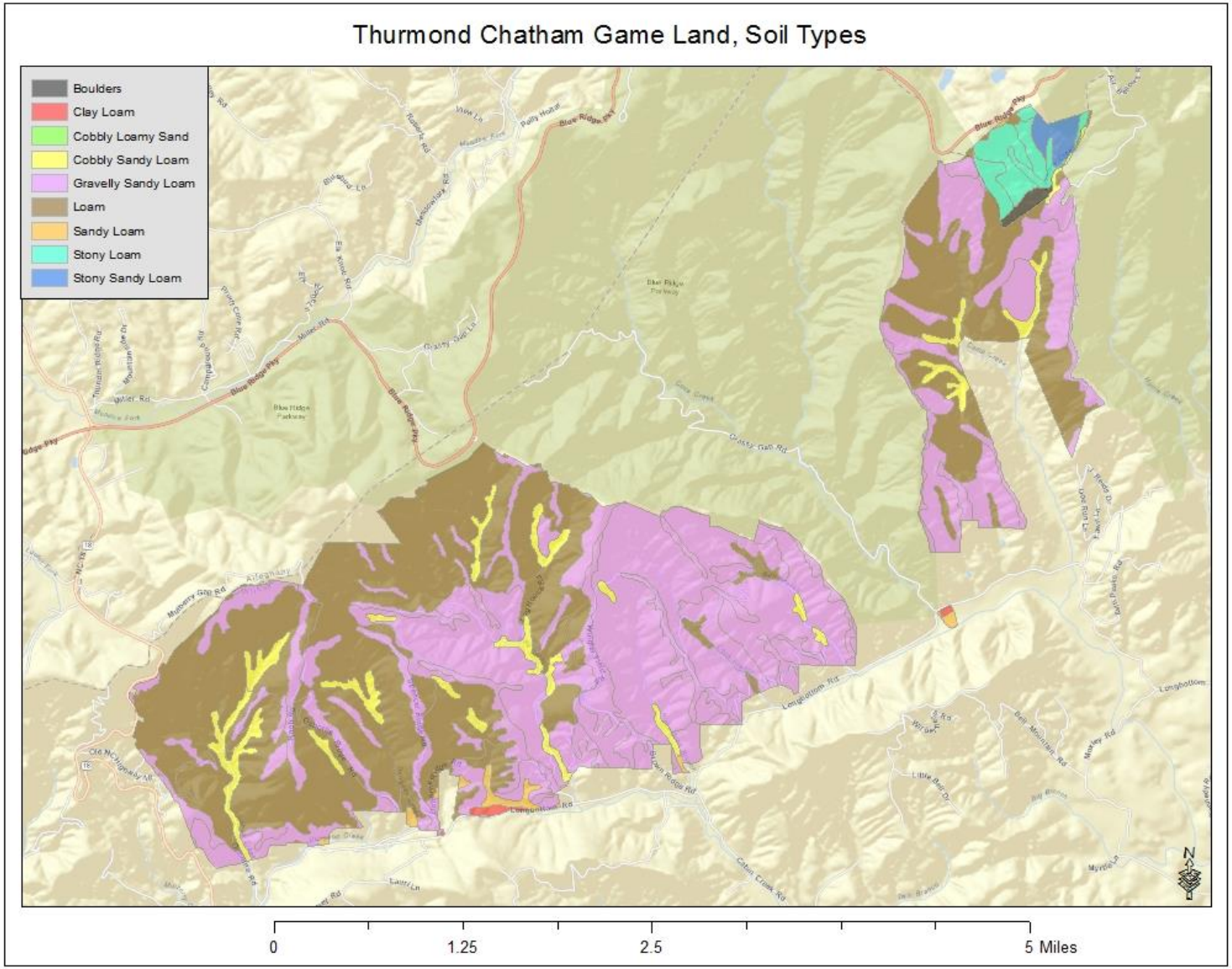
Map 6. Mitchell River Game Land, Natural Heritage Dedication (also see Appendix 2).



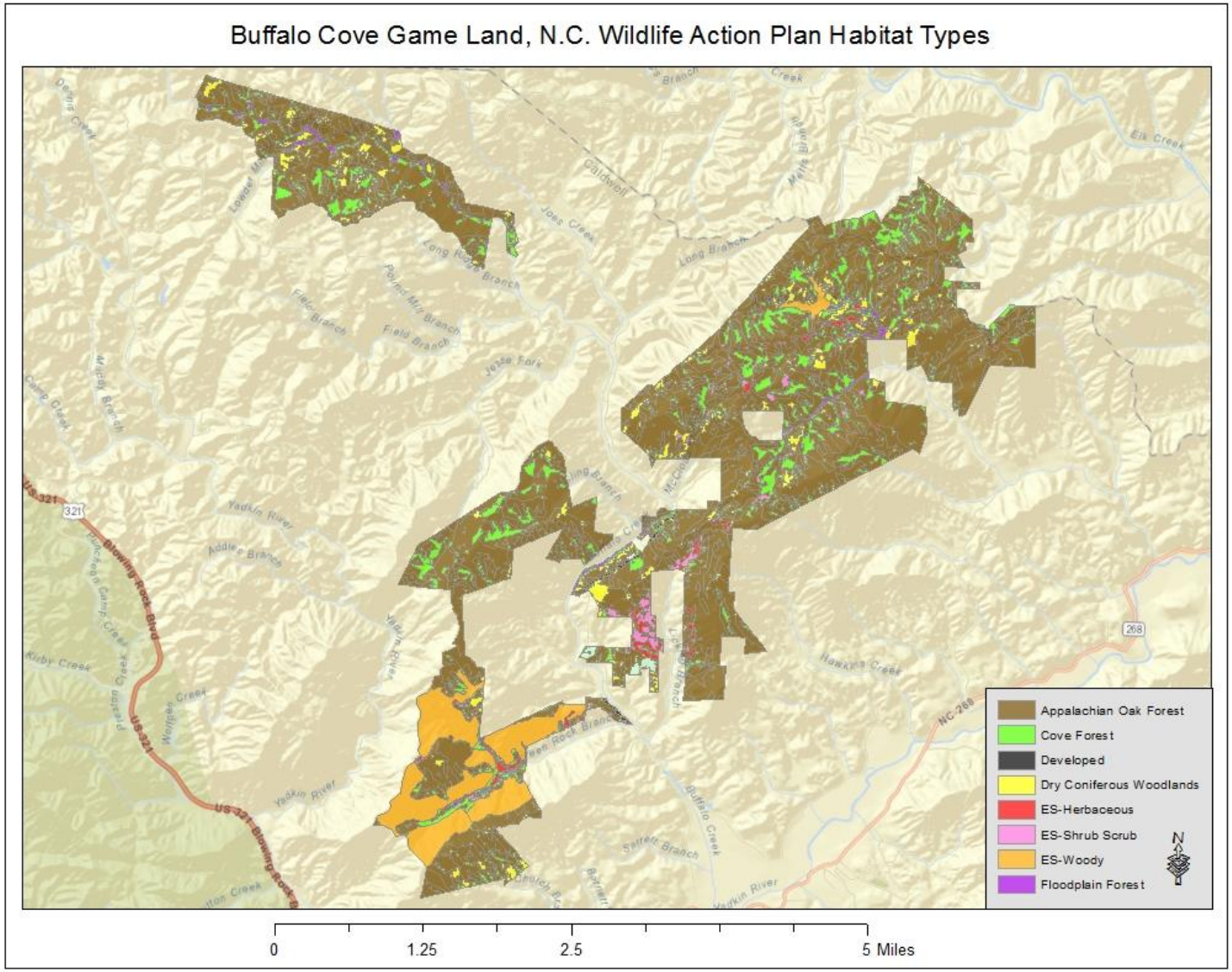
Map 7. Buffalo Cove Game Land, Soil Types (Soil Survey Staff 2015).



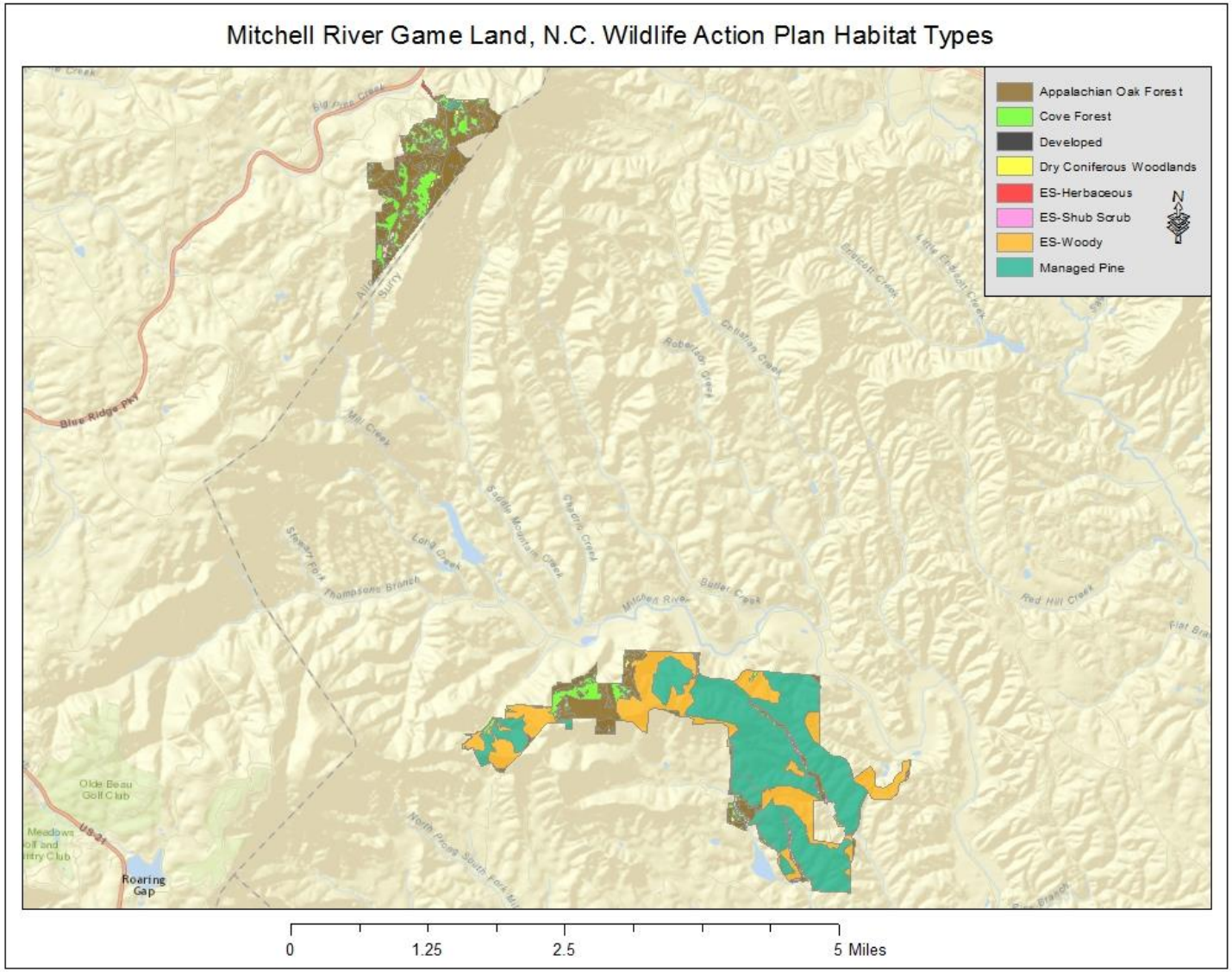
Map 8. Mitchell River Game Land, Soil Types (Soil Survey Staff, 2015).



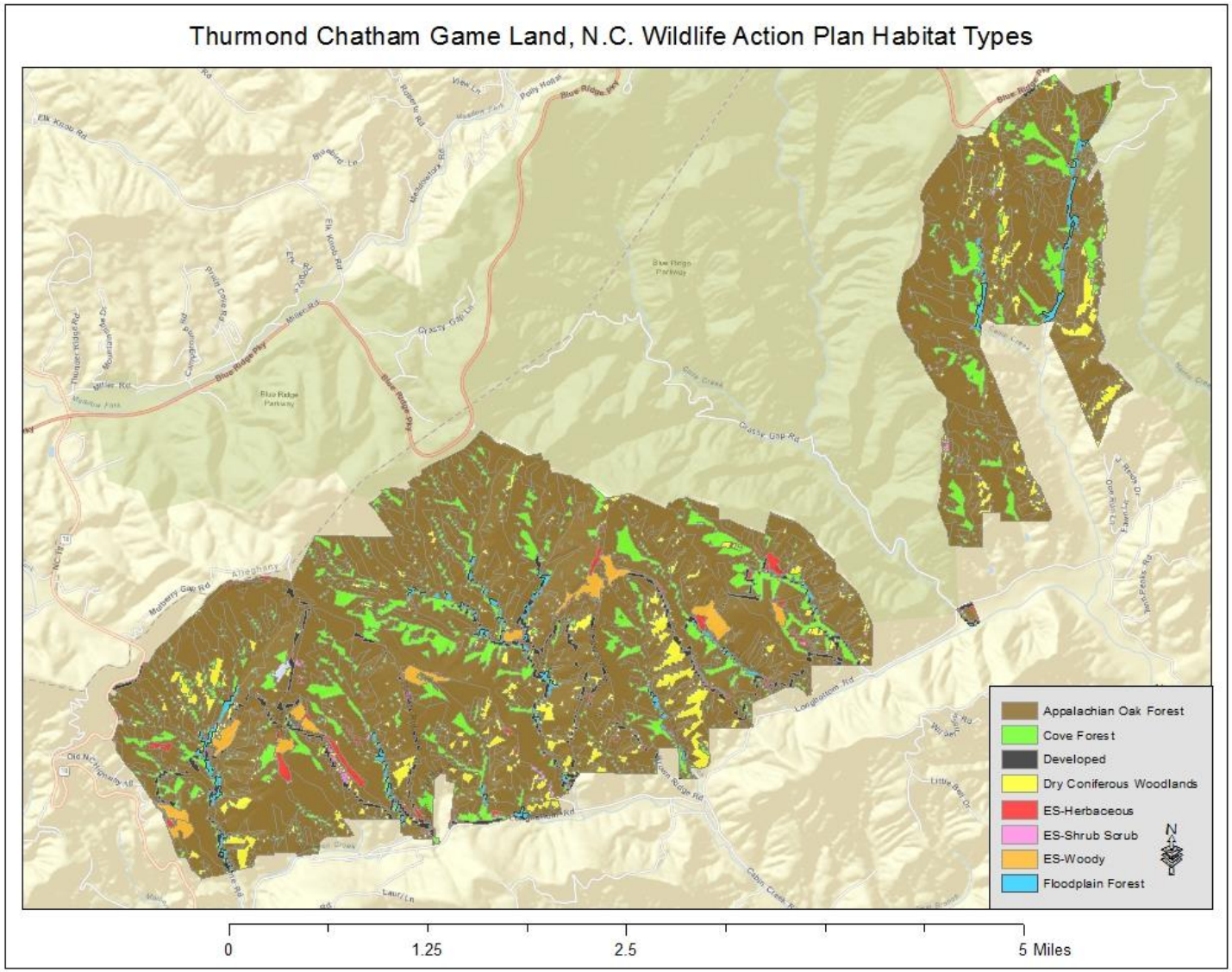
Map 9. Thurmond Chatham Game Land, Soil Types (Soil Survey Staff, 2015).



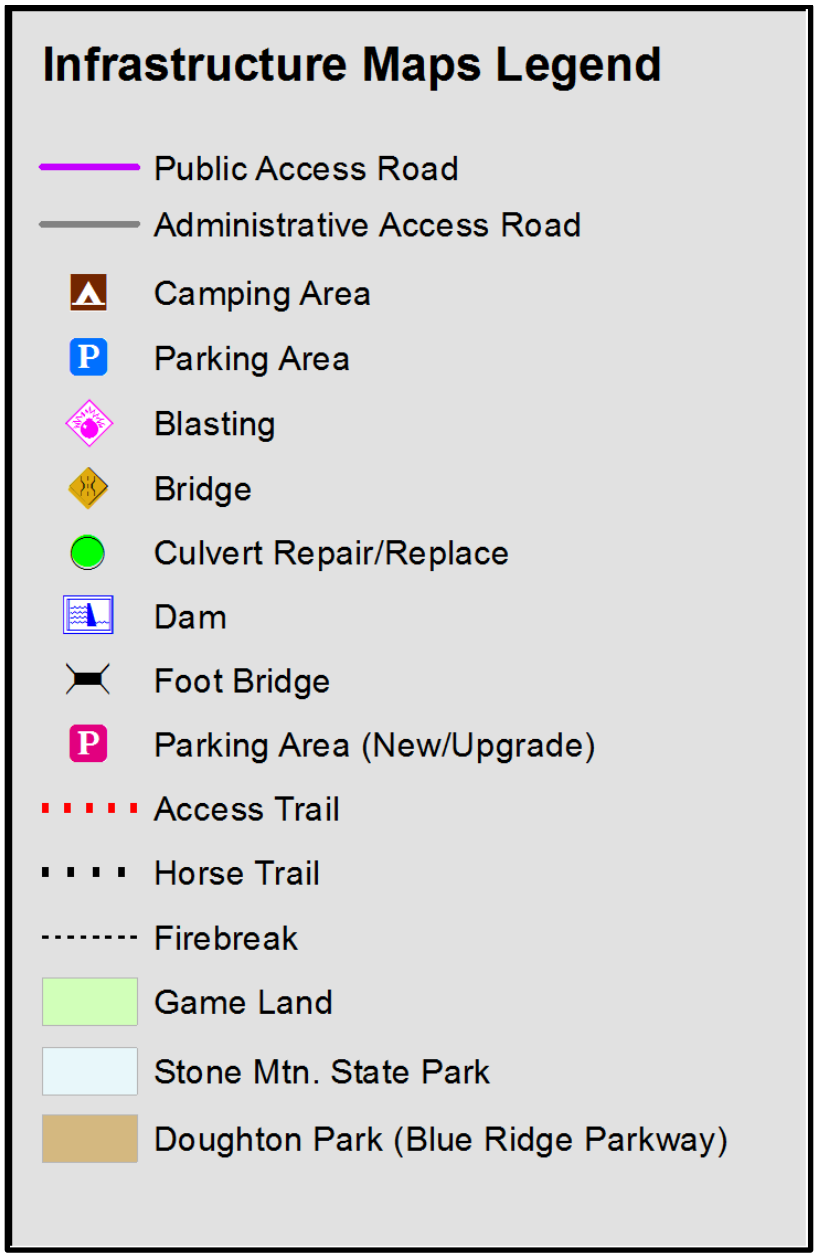
Map 10. Buffalo Cove Game Land, N.C. Wildlife Action Plan Habitat Types (N.C. State University 2008) (N.C. Wildlife Resources Commission 2015).

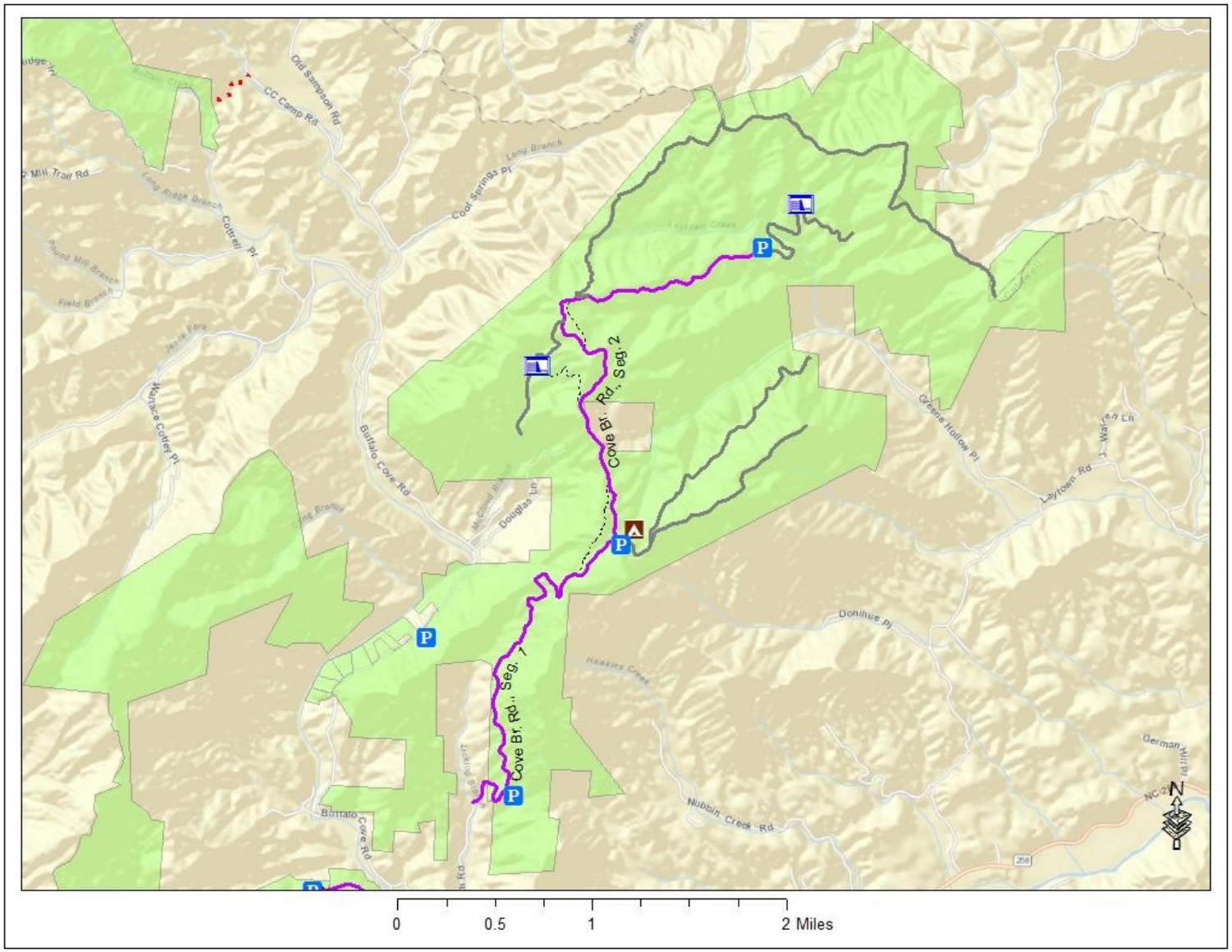


Map 11. Mitchell River Game Land, N.C. Wildlife Action Plan Habitat Types (N.C. State University 2008) (N.C. Wildlife Resources Commission 2015).

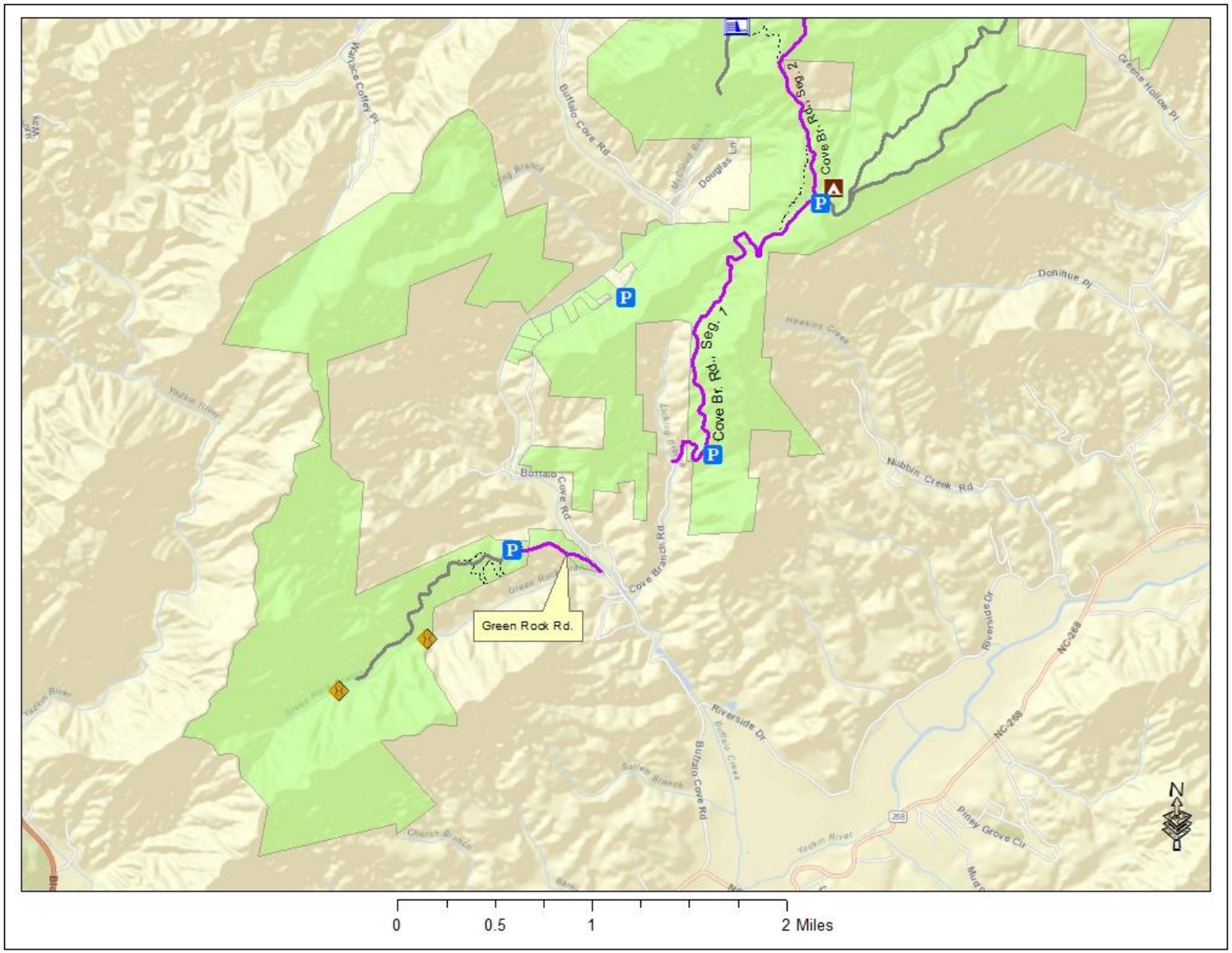


Map 12. Thurmond Chatham Game Land, N.C. Wildlife Action Plan Habitat Types (N.C. State University 2008) (N.C. Wildlife Resources Commission 2015).

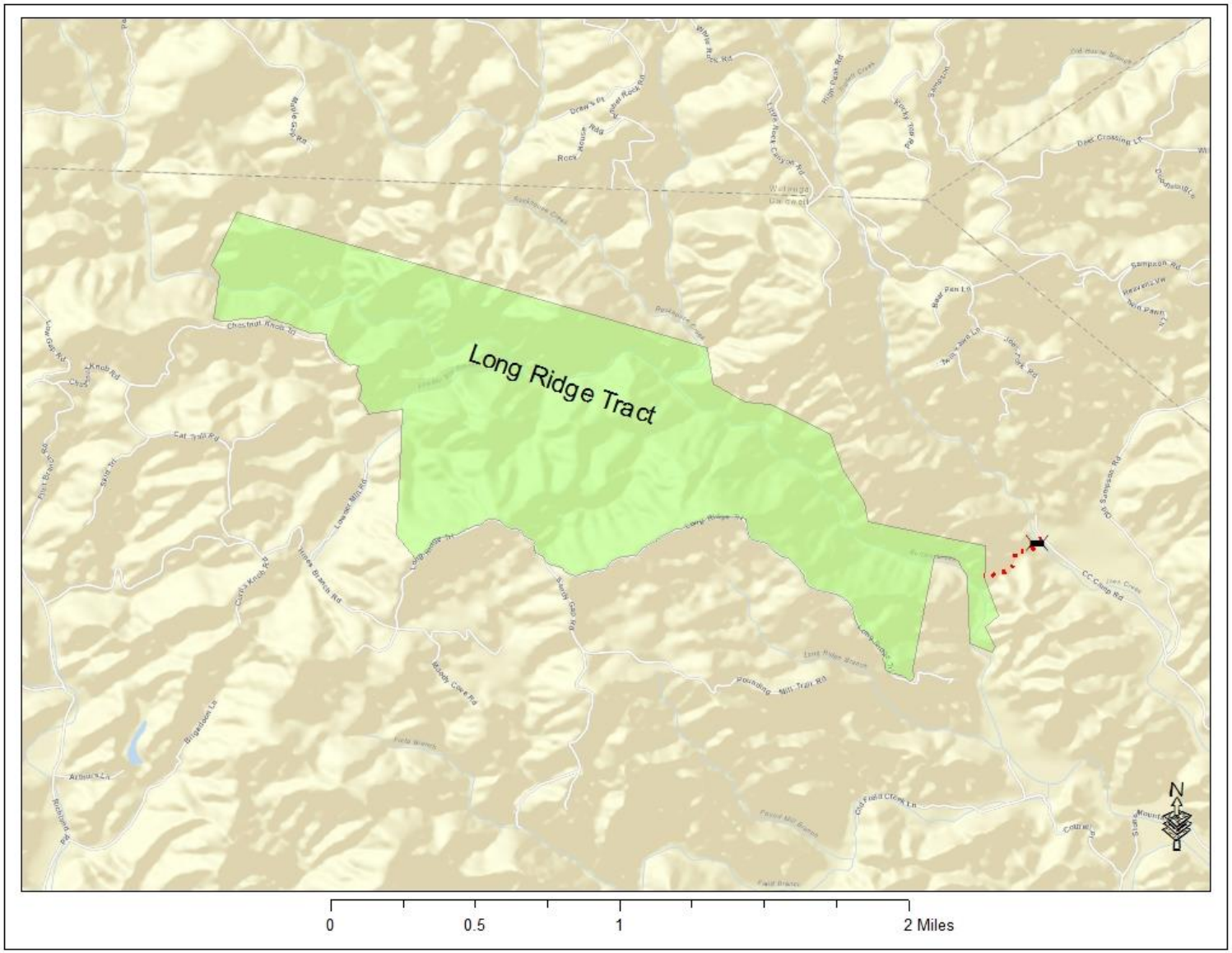

Infrastructure Maps Legend
Public Access Road
Administrative Access Road
Camping Area
Parking Area
Blasting
Bridge
Culvert Repair/Replace
Dam
Foot Bridge
Parking Area (New/Upgrade)
Access Trail
Horse Trail
Firebreak
Game Land
Stone Mtn. State Park
Doughton Park (Blue Ridge Parkway)



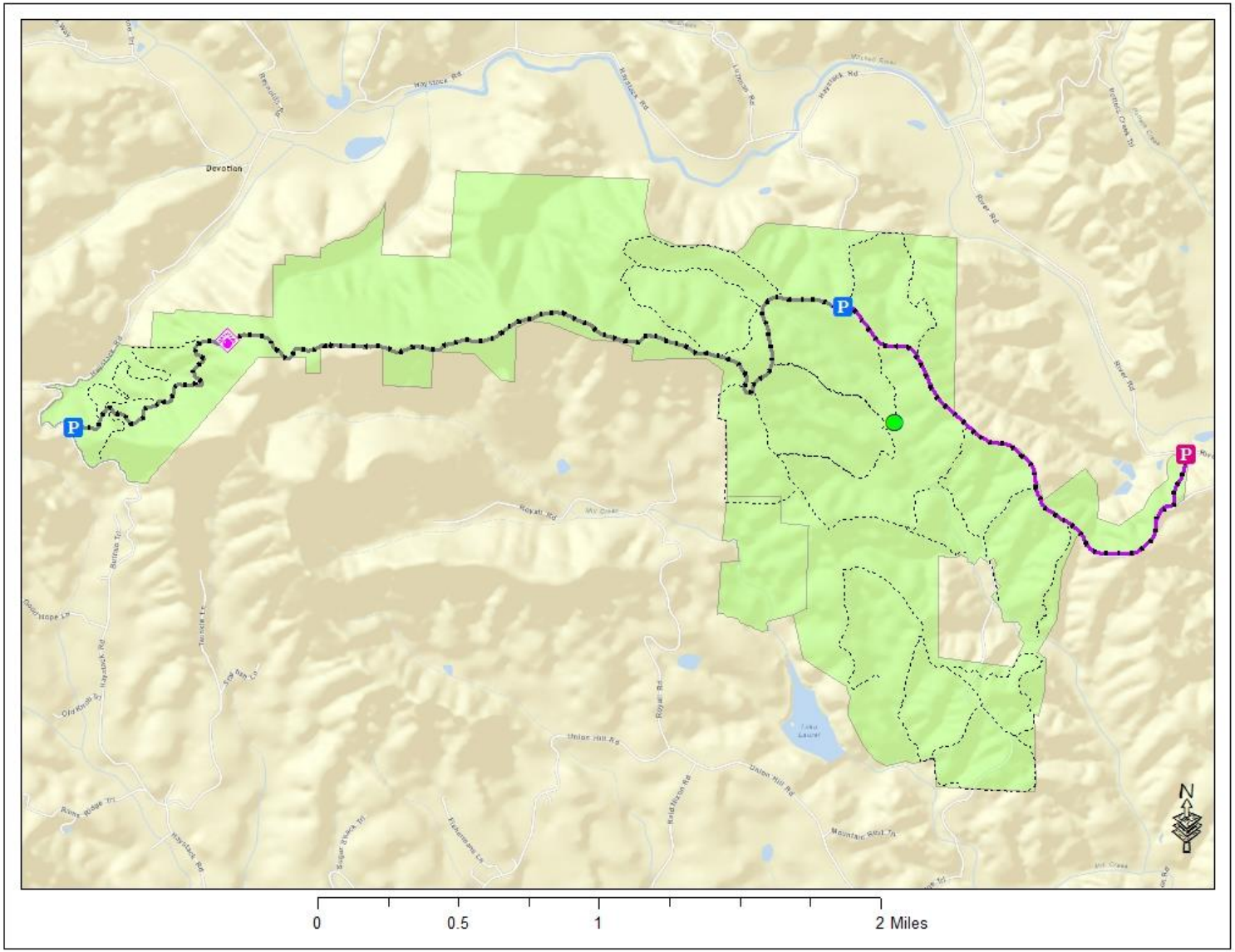
Infrastructure Map 1, Buffalo Cove Game Land.



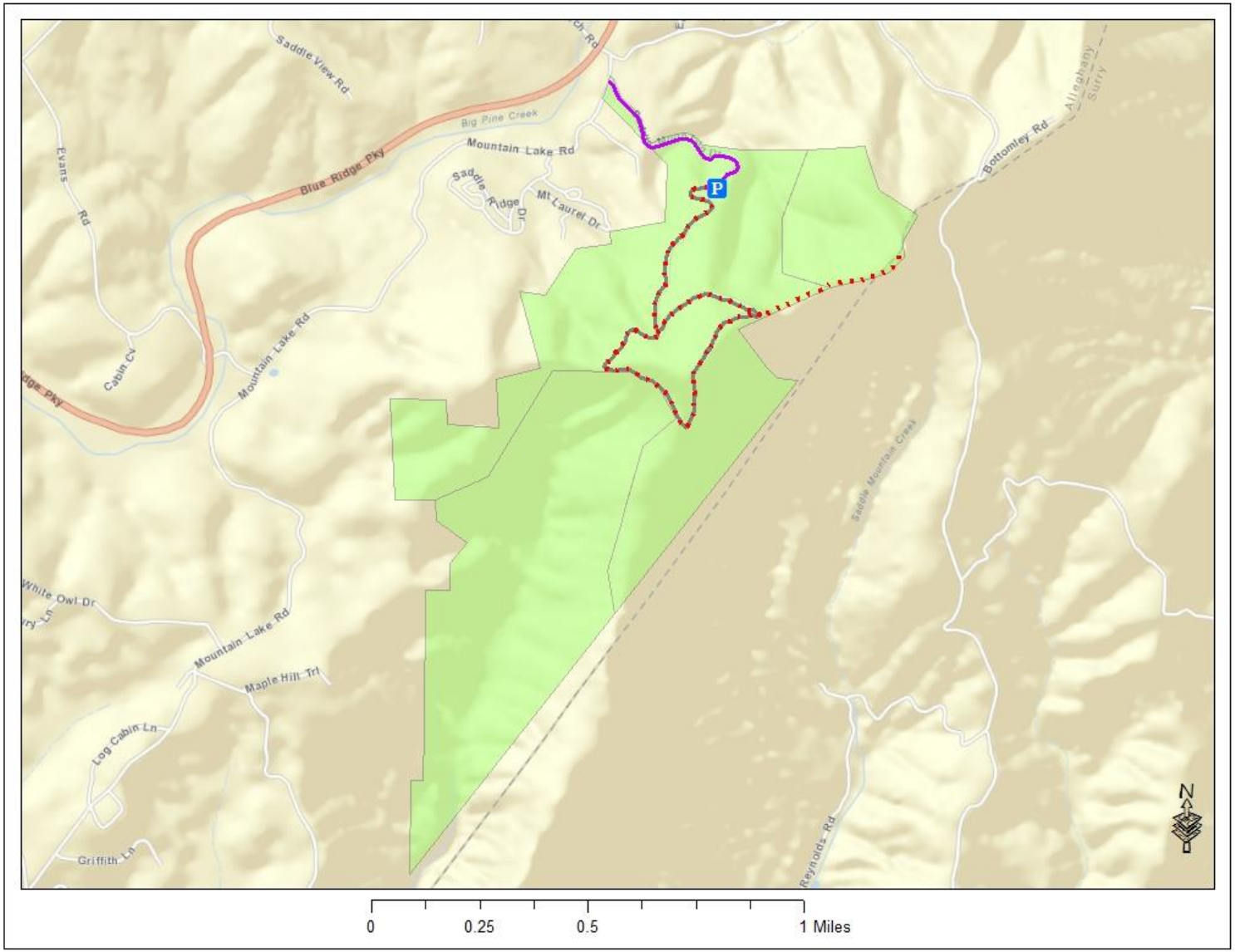
Infrastructure Map 2, Buffalo Cove Game Land.



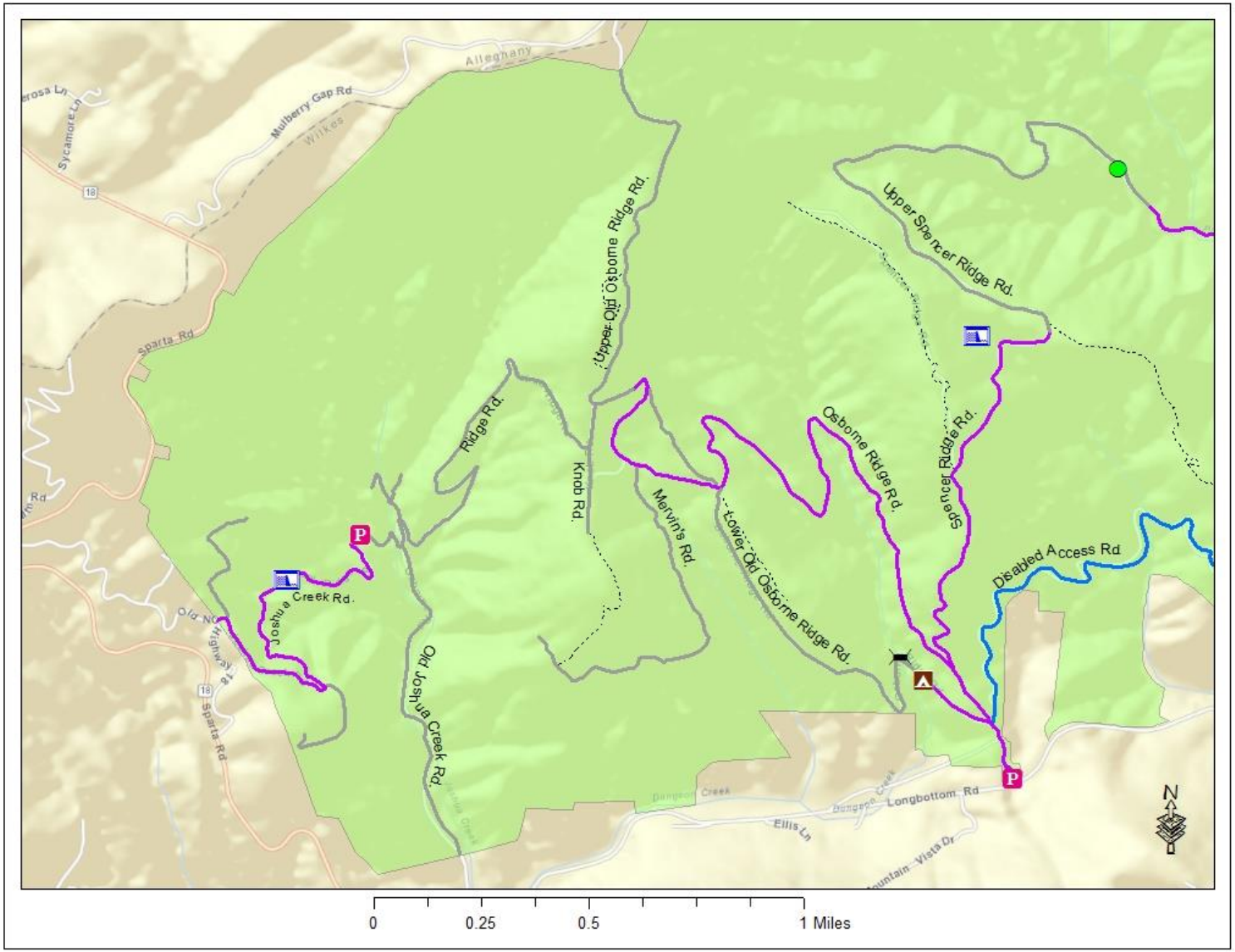
Infrastructure Map 3, Buffalo Cove Game Land.



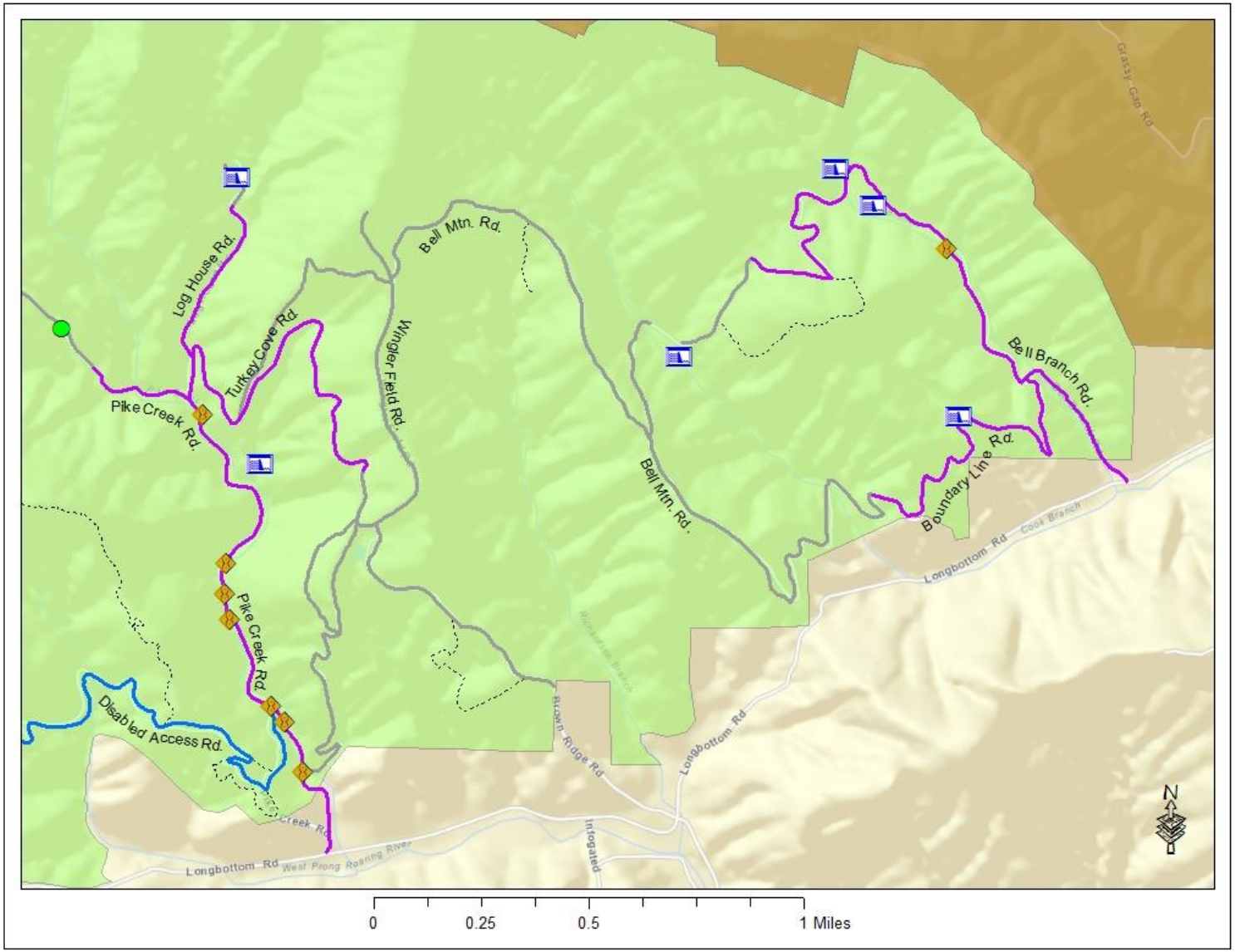
Infrastructure Map 1, Mitchell River Game Land.



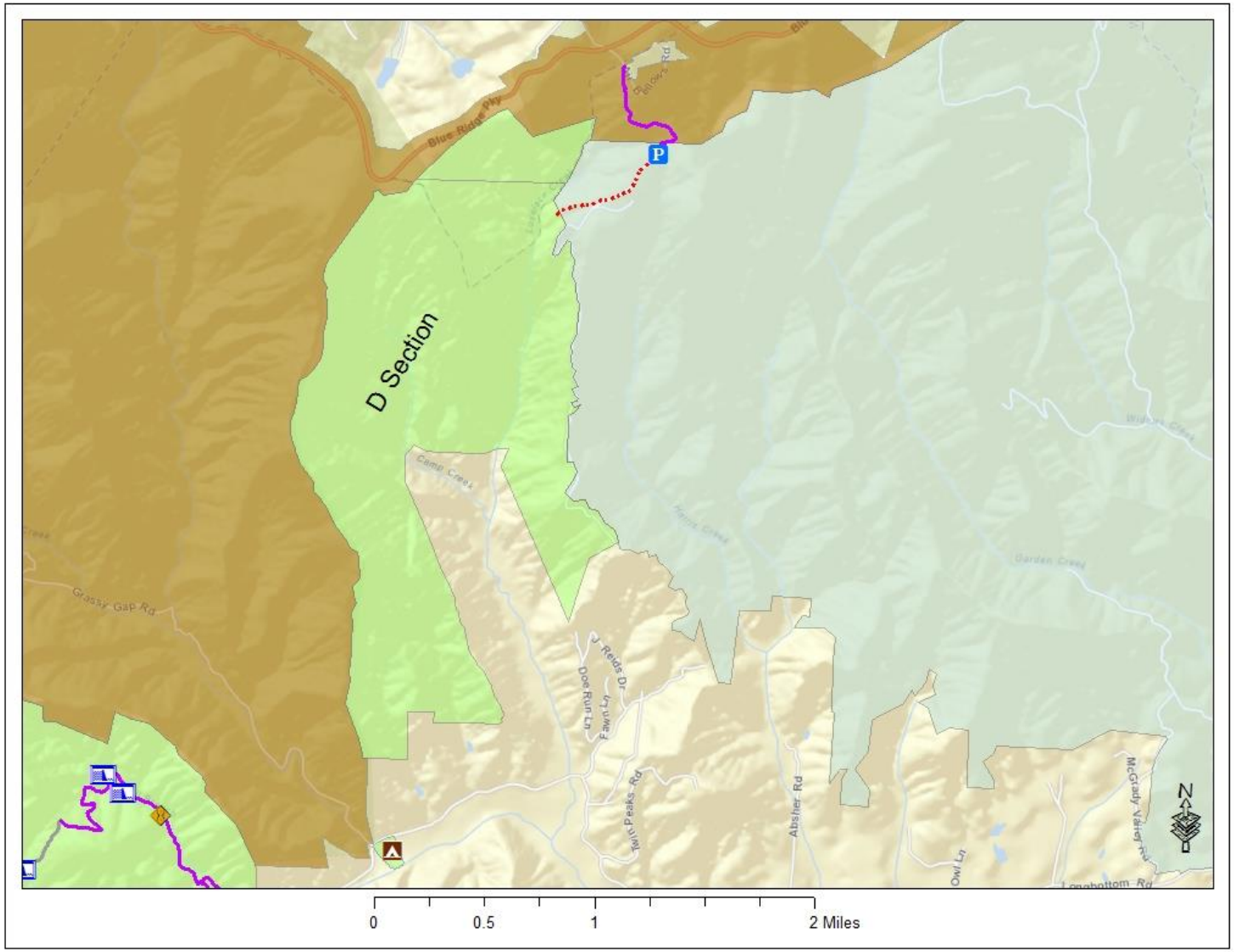
Infrastructure Map 2, Mitchell River Game Land.



Infrastructure Map 1, Thurmond Chatham Game Land.



Infrastructure Map 2, Thurmond Chatham Game Land.



Infrastructure Map 3, Thurmond Chatham Game Land.

APPENDIX 2 – NATURAL HERITAGE ARTICLES OF DEDICATION

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

December 22, 2008

Secretary William G. Ross, Jr.
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 **Buffalo Cove Game Land**, Caldwell and Wilkes Counties

Dear Secretary Ross 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

These real properties are currently administered by the North Carolina Wildlife Resources Commission as a portion of the Buffalo Cove Game Land and consist of approximately 6,616 acres located in Caldwell and Wilkes Counties and composed of:

1. Buffalo Cove tracts (Primary Area)	2,573 acres
2. Buffalo Cove tracts (Buffer Area)	4,043 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 **Buffalo Cove 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@ncmail.net
An Equal Opportunity/Affirmative Action Employer

Location Address:
116 West Jones Street
Raleigh, North Carolina

NAT-014.001

Dedication of the qualified portions of the tract fulfills the terms of any prior grant agreements, including those of the Natural Heritage Trust Fund, Clean Water Management Trust Fund, and Ecosystem Enhancement Program.

The Governor and Council of State have approved the dedication of the State-owned lands hereinabove described as the Buffalo Cove Game Land 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 9th day of September, 2008.

Sincerely,

Britt Cobb

BC

CONSENTED AND AGREED TO:

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

Gordon S. Myers, Executive Director
Wildlife Resources Commission

EXHIBIT A

BUFFALO COVE GAME LAND DEDICATED NATURE PRESERVE
EASTERN SEGMENT

DESCRIPTION

COUNTY: Caldwell and Wilkes County TOPO QUAD: Buffalo Cove, Grandin 7.5'

SIZE OF AREA: ca. 5,648 acres total
(primary area 1,710 acres; buffer area 3,937 acres)

OWNER/ADMINISTRATOR: State of North Carolina
Wildlife Resources Commission

LOCATION: North-central Caldwell County and adjacent Wilkes County. The eastern segment is east of Buffalo Cove Road and the community of Buffalo Cove, several miles north of NC 268. Access is from Buffalo Cove Road (SR 1504) and Cove Branch Road (SR 1504), 1.6 - 2 miles north of NC 268.

DESCRIPTION: Buffalo Cove Game Land lies within the Blue Ridge escarpment, the steep, rugged band of land that forms the eastern edge of the Blue Ridge Mountains. Elevations are relatively low for the mountains, ranging up only to about 2600 feet, but the landscape is very dissected and mountainous. The area consists of narrow ridge tops, plunging spur ridges and ravines, steep sides slopes, and somewhat broader coves along the major creeks.

The landscape is one of nearly contiguous forest. Chestnut Oak Forest is the most abundant natural community type. Chestnut oak (*Quercus montana*) and scarlet oak (*Quercus coccinea*) are the dominant trees, and a shrub layer dominated by various members of the heath family is prominent. Mountain laurel (*Kalmia latifolia*) most often dominates, but lowbush blueberry (*Vaccinium pallidum*), black huckleberry (*Gaylussacia baccata*), and even Carolina rhododendron (*Rhododendron minus*) are abundant. More limited patches on the ridges and higher slopes support Montane Oak–Hickory Forest, with a canopy that includes white oak (*Quercus alba*), red oak (*Quercus rubra*), black oak (*Quercus velutina*), and various hickories (*Carya glabra, Carya alba*) in addition to chestnut oak and scarlet oak. The occurrence of this community type is probably related to geology. Lower slopes, ravines, and coves support Acidic Cove Forest communities, dominated by a mix of trees that includes tulip poplar (*Liriodendron tulipifera)*, red maple (A*cer rubrum)*, white pine (*Pinus strobus)*, sweet birch *(Betula lenta*), and Canada hemlock (*Tsuga canadensis*), as well as smaller numbers of oaks. This community too generally has a dense shrub layer, dominated by rosebay rhododendron (*Rhododendron maximum*). One area, on Winding Stairs Mountain, supports a small example of a Carolina Hemlock Bluff community, with Carolina hemlock (*Tsuga caroliniana*) dominating the canopy. Carolina rhododendron dominates the shrub layer in this community. Limited patches of Pine–Oak/Heath communities, dominated by pitch pine (*Pinus rigida*) and Table Mountain pine (*Pinus pungens*) are also present. A small Low Elevation Rocky Summit community is present on rock outcrops on the west side of Spring Mountain.

The forest communities very widely in maturity within the game land, reflecting the logging that took place in the past throughout the site. Most of the primary area of the dedication has forests that are mature, with trees averaging 12" dbh and some larger trees present, and with less altered canopy composition. These appear to be areas where logging was more selective, leaving more older trees.

Few rare species are known from the tract. Coal skink (*Eumeces anthracinus*), a watch list species, has been found. Other wildlife are abundant, including black bear, wild turkey, bobcat, and numerous song birds.

BOUNDARY JUSTIFICATION: The primary area includes the limited, relatively contiguous areas of natural communities in good condition; 100- to 300-foot primary areas along each side of identifiable stream channels are also dedicated as primary areas to protect water quality in the creeks. The buffer area consists of the lower quality, less mature forests adjoining the primary areas.

MANAGEMENT AND USE: The preserve is used for public hunting, passive recreation, and wildlife management. Prescribed burning is encouraged throughout the dedicated area. An extensive network of roads is present within the dedicated areas. A series of small wildlife fields and a few cleared areas used for logging decks are also present at scattered locations. These may be maintained as previously existing disturbances.

EXHIBIT A

BUFFALO COVE GAME LAND DEDICATED NATURE PRESERVE
WESTERN SEGMENT

DESCRIPTION

COUNTY: Caldwell County TOPO QUAD: Buffalo Cove 7.5'

SIZE OF AREA: ca. 969 acres total
(primary area 863 acres; buffer area 106 acres)

OWNER/ADMINISTRATOR: State of North Carolina
Wildlife Resources Commission

LOCATION: North-central Caldwell County. The western segment is along Buffalo Creek, roughly 1 to 3.6 air miles northwest of the community of Buffalo Cove. Access from the east is by an old forest road from Joe's Fork Road (SR 1574). Access from the west is by private roads running from Richlands Road (SR 1372).

DESCRIPTION: Buffalo Cove Game Land lies within the Blue Ridge escarpment, the steep, rugged band of land that forms the eastern edge of the Blue Ridge Mountains. Elevations are relatively low for the mountains, ranging up only to about 2500 feet, but the land is extremely rugged. This segment consists of a steep gorge along Buffalo Creek, with narrow ridge tops, plunging spur ridges and ravines, steep sides slopes, and a narrow bottom along the creek.

The gorge contains extensive occurrences of forest communities in very good to excellent condition. Substantial areas have structure that approaches that of old-growth forests, with trees averaging 16" dbh with many larger trees. These are interspersed with forests that have somewhat smaller trees but are still quite mature and in good condition, along with small patches that are younger. More extensive younger forests are present in the buffer area.

The most abundant natural community type is Chestnut Oak Forest. Chestnut oak (*Quercus montana*) is the dominant tree, but white pine (*Pinus strobus*) is a prominent component in much of this forest, and scarlet oak (*Quercus coccinea*) and pines (*Pinus pungens, Pinus echinata*) are in portions. There is a prominent, often dense, shrub layer of mountain laurel (*Kalmia latifolia*), black huckleberry (*Gaylussacia baccata*), or lowbush blueberry (*Vaccinium pallidum*). Other less typical shrubs are sometimes present, including sand-myrtle (*Leiophyllum buxifolium*), Catawba rhododendron (*Rhododendron catawbiense*), chinquapin (*Castanea pumila*), and horse sugar (*Symplocos tinctoria*).

Also very abundant in this segment is Acidic Cove Forest, occupying most of the lower slopes. It has typical composition, with the canopy a mix of tulip poplar (*Liriodendron tulipifera)*, red maple (*Acer rubrum)*, white pine (*Pinus strobus)*, sweet birch *(Betula lenta*), and Canada hemlock (*Tsuga canadensis*), as well as smaller numbers of oaks. This community too generally has a dense shrub layer, dominated by rosebay rhododendron (*Rhododendron maximum*).

A number of different, less common natural communities are present. Montane Acidic Cliff communities occur on rock outcrops scattered in several parts of the site. Most are steep to vertical or overhanging cliffs, embedded in the mid to lower slopes of the gorge sides. They have sparse vegetation that includes lichens and mosses. A few characteristic herbs are present, such as crag jangle (*Heuchera villosa*),

marginal shield fern (*Dryopteris marginalis*), and bladder fern (*Cystopteris protrusa*), along with more widespread herbs in pockets of deeper soil. One outcrop is more gently sloping and has glade-like vegetation with more trees and with fairly extensive cover of little bluestem (*Schizachyrium scoparium*).

Smaller patches of Pine–Oak/Heath and Rich Cove Forest are also present in good condition. Well-developed Rocky Bar and Shore communities are scattered down the length of Buffalo Creek on open cobble to boulder bars. They have sparse vegetation but a fairly high diversity of herbs and shrubs. Alder (*Alnus serrulata*) and yellowroot (*Xanthorhiza simplicissima*) are generally present.

Several uncommon plant species that are on the Natural Heritage Program watch list are present in this segment. These include Fraser's sedge (*Cymophyllus fraserianus*), Carey saxifrage (*Saxifraga careyana*), and roundleaf ragwort (*Packera obovata*). This unusually rugged and remote area likely supports forest interior birds, black bears, and a variety of other forest wildlife.

BOUNDARY JUSTIFICATION: The primary area includes the relatively contiguous areas of natural communities in good condition, occupying most of this segment. Additional 100-foot wide areas on each side of Buffalo Creek are also dedicated as primary areas to protect water quality. The buffer area consists of the lower quality, less mature forests adjoining the primary areas.

MANAGEMENT AND USE: The dedicated nature preserve is used for public hunting, passive recreation, and wildlife management. Prescribed burning is encouraged throughout the dedicated area. A few roads are present within the dedicated areas. These may be maintained as previously existing disturbances.

THIS DEDICATION OF THE **BUFFALO COVE 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 **Buffalo Cove 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 2,573 acres) and a Buffer Area (approximately 4,043 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 core natural area encompassing rare natural community types, such as Montane Acidic Cliff, and high-quality examples of common community types, including Chestnut Oak Forest, Montane Oak-Hickory Forest, and Acidic Cove Forest, with smaller patches of Rich Cove Forest, Pine-Oak/Heath, and Rocky Bar and Shore.

   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 lower quality and predominantly younger hardwood forests.

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.

The Primary Areas defined along streams in the Mingo section that extend for 300 feefrom each edge of the stream are the areas that were protected through deed restrictions imposed by the Ecosystem Enhancement Program. These deed restrictions are recorded in Caldwell County, NC, Register of Deeds, December 12, 2003, Deed Book 1483, Pages 943-960 and in Wilkes County, NC, Register of Deeds, December 12, 2003, Deed Book 0933, Page 0234.

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."

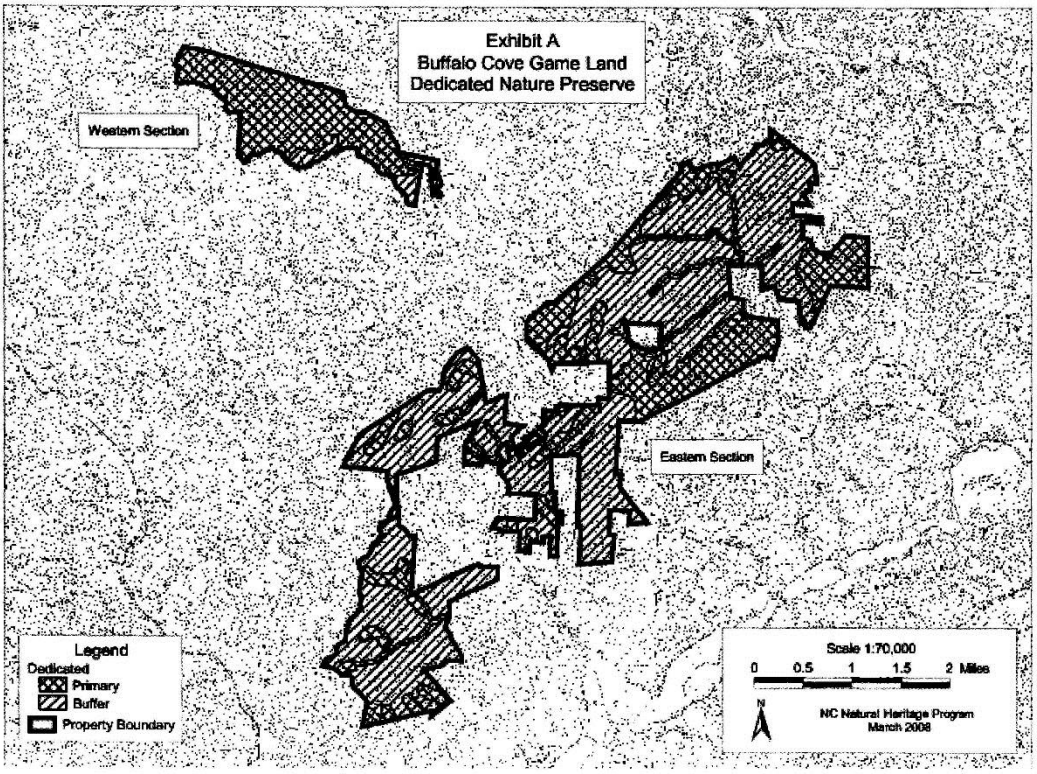


Exhibit A
Buffalo Cove Game Land
Dedicated Nature Preserve
Western Section
Eastern Section
Legend
Dedicated
Primary
Buffer
Property Boundary
Scale 1:70,000
0 0.5 1 1.5 2 Miles
N
NC Natural Heritage Program
March 2008

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 **Mitchell River Game Land**, Alleghany 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 Mitchell River Game Land and consists of approximately 467 acres located in Alleghany County, and composed of:

1. Mitchell River Game Land tract (Primary Area)	394 acres
2. Mitchell River Game Land (Buffer Area)	73 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 **MITCHELL 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 agreements, including that of the Natural Heritage Trust Fund.

The Governor and Council of State have approved the dedication of the State-owned lands hereinabove described as the Mitchell 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
MITCHELL RIVER GAME LAND
DEDICATED NATURE PRESERVE

COUNTY: Alleghany County PHYSIOGRAPHIC PROVINCE: Blue Ridge

TOPOGRAPHIC QUADS: Cumberland Knob and Roaring Gap

SIZE OF AREA: ca. 467 acres (394 acres primary; 73 acres buffer)

OWNER/ADMINISTRATOR: State North Carolina, Wildlife Resources Commission

LOCATION: Located along the escarpment of the Blue Ridge, the Mitchell River Game Land is dominated by the southern summit of Saddle Mountain (Elev. 3367 feet). The Blue Ridge Parkway is approximately 0.5 miles to the northwest, and Lens Knob is 2.1 air miles south-southwest.

DESCRIPTION: This site consists of upper slopes of the Blue Ridge Escarpment, with rugged steep slopes and coves along an unnamed tributary to Saddle Mountain Creek that flows south from the escarpment. A network of gravel roads provides access to the ridges. The site is vegetated by forests that have experienced periodic timber removal. Land use adjacent to this preserve includes forestry, agriculture, recreational development (along the Blue Ridge Parkway), and increasing residential development (homes and trailer parks nearby). In areas that qualify for dedication, Chestnut Oak Forest, Acidic Cove Forest, Montane Oak-Hickory Forest, and small patches of Pine/Oak-Heath are found.

Chestnut Oak Forest occupies most low, mid, and upper dry slopes throughout the site. This community type grades into Montane Oak-Hickory Forest at high elevations along the summit of the escarpment, and into Acidic Cove Forest at lower elevations along the stream corridor. Pine/Oak-Heath is embedded along dry south-facing slopes. The Chestnut Oak Forest is characterized by a closed canopy dominated primarily by chestnut oak (*Quercus montana*). Other common canopy species include northern red oak (*Q. rubra*), scarlet oak (*Q. coccinea*), mockernut hickory (*Carya alba*), sweet pignut hickory (*C. glabra*), sand hickory (*C. pallida*), tulip poplar (*Liriodendron tulipifera*), and various pines (*Pinus* spp.). Understory species include sourwood (*Oxydendrum arboreum*), downy serviceberry (*Amelanchier arborea*), black gum (*Nyssa sylvatica*), and scattered dogwoods (*Cornus florida*). Common shrubs present are great laurel (*Rhododendron maximum*), mountain laurel (*Kalmia latifolia*), blueberries (*Vaccinium corymbosum*, *V. stamineum*, and *V. pallidum*), maple-leaf viburnum (*Viburnum acerifolium*), and wild hydrangea (*Hydrangea arborescens*). Herbs such as spotted wintergreen (*Chimaphila maculata*), milkweeds (*Asclepias* spp.), asters (*Symphyotrichum* and *Eurybia* spp.), naked trefoil (*Desmodium nudiflorum*), goldenrods (*Solidago* spp.), Christmas fern (*Polystichum acrostichoides*), and tickseed (*Coreopsis major*) are common.

Acidic Cove Forest occurs along the lower slopes, stream corridors, and small coves throughout the site. This community grades into Chestnut Oak Forest upslope. The Acidic Cove Forest has a generally closed canopy with areas of open canopy along the stream and along the old logging/access road that follows the stream. Canopy species include tulip poplar, Canada hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), yellow birch (*Betula lenta*), white oak, northern red oak, sweet pignut hickory, and scattered

pines. The understory contains witch hazel (*Hamemelis virginiana*), American holly (*Ilex opaca*), flowering dogwood, black gum, chinquapin (*Castanea pumila*), and sourwood. Shrubs include great laurel, mountain laurel, spicebush (*Lindera benzoin*), sweet shrub (*Calycanthus floridus*), sweet pepper bush (*Clethra acuminata*), winterberry (*Gaultheria procumbens*), and various blueberries. Herbaceous species include violet (*Viola blanda, V. rotundifolia,* and *V. hastata*), ground pine (*Lycopodium obscurum* var. *obscurum*), cankerweed (*Prenanthes serpentaria*), wood aster (*Eurybia divaricata*), shining clubmoss (*Huperzia lucidula*), meadow rue (*Thalictrum* sp.), bluets (*Houstonia purpurea*), Canada snakeroot (*Sanicula canadensis*), and bloodroot (*Sanguinaria canadensis*).

Montane Oak-Hickory Forest occurs near the summit of the escarpment. This community type grades into Chestnut Oak Forest at lower elevations. The Montane Oak-Hickory Forest is characterized by a closed canopy dominated primarily by northern red oak, white oak, tulip poplar, mockernut hickory, sweet pignut hickory, and red maple. The understory includes canopy species, sourwood, American holly, downy serviceberry, flowering dogwood, and chinquapin. Shrubs are sparse and include scattered patches of mountain laurel and great laurel. Other shrubs include beaked hazelnut (*Corylus cornuta*), strawberry bush (*Euonymus americanus*), and blueberries. The herbaceous layer is relatively diverse with white bergamot (*Monarda clinapoda*), Canada cinquefoil (*Potentilla canadensis*), Christmas fern, gall of the earth (*Prenanthes trifoliata*), naked trefoil, panicled-leaf trefoil (*Desmodium paniculatum*), trillium (*Trillium* spp.), downy elephant's foot (*Elephantopus tomentosa*), and downy rattlesnake plantain.

The Pine/Oak-Heath is embedded within the more extensive Chestnut Oak Forest. All pine species have been affected by natural factors including storm damage and southern pine bark beetle, which have led to an unusually open canopy. In areas with pine damage, encroachment by oak and hickory species or pine regeneration is occurring. The understory is sparse with black gum and sourwood. The forest has a closed to semi-open canopy dominated by shortleaf pine (*Pinus echinata*), pitch pine (*P. rigida*), scrub pine (*P. virginiana*), chestnut oak, scarlet oak, mockernut hickory, and sweet pignut hickory. Patches of shrubs are dominated by mountain laurel or mixed shrubs including maleberry (*Lyonia ligustrina*), fetterbush, chinquapin, American chestnut (*Castanea dentata*) sprouts, deerberry, and lowbush blueberry. The herb layer is sparse and includes tickseed, gall of the earth, ox-eye daisy (*Chrysanthemum leucanthemum*), common ragweed (*Ambrosia artemisiifolia*), bracken fern (*Pteridium aquilinum*), panic grass (*Dichanthelium dichotomum*), ebony spleenwort (*Asplenium platyneuron*), and ragwort (*Packera* sp.).

BOUNDARY JUSTIFICATION: The primary boundary represents a core natural area that encompasses high quality natural communities. The buffer area, which contributes to the management and protection of the primary area, consists of less mature portions of the forest adjoining the primary area. The buffer will function to reduce intrusion of edge effects into the primary area, contribute to connection with nearby natural areas, provide additional habitat for wider ranging animal species, and protect water quality and aquatic habitat.

MANAGEMENT AND USE: The dedicated nature preserve will be managed as the Mitchell River Game Land for public hunting and protection of wildlife habitat. Improvement of wildlife habitat will occur in the buffer areas. The management of exotic and invasive species, especially along existing roads, should be implemented.

THIS DEDICATION OF THE MITCHELL 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 Mitchell 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 ecreational 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 394 acres) and a Buffer Area (approximately 73 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 Chestnut Oak Forest, Acidic Cove Forest, Montane Oak-Hickory Forest, and Pine/Oak-Heath natural community types. 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 younger forests and disturbed areas along roads.

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."

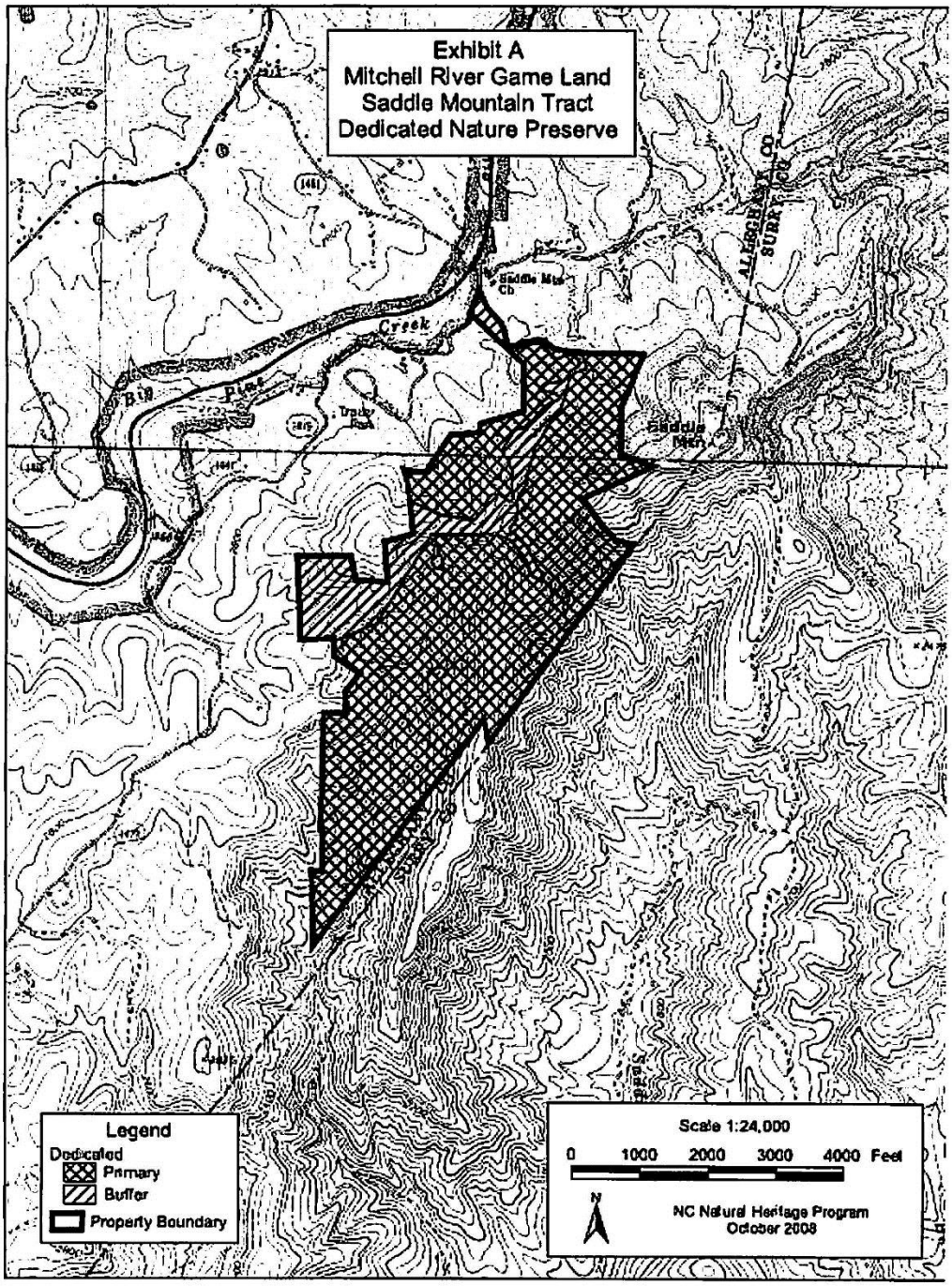


Exhibit A
Mitchell River Game Land
Saddle Mountain Tract
Dedicated Nature Preserve
Creek
Big
Pine
Saddle Mtn
Legend
Dedicated
Primary
Buffer
Property Boundary
Scale 1:24,000
0 1000 2000 3000 4000 Feet
N
NC Natural Heritage Program
October 2008

APPENDIX 3 – 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 4 – SUMMARY OF PUBLIC INPUT

Seven questions were presented to the public for their input at a meeting held in Wilkesboro on 8/25/15. 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 BCGL?

Comment	**Responses**
Food Plots/Open Areas	5
Early Successional	2
Deer Habitat	1
Turkey Habitat	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 BCGL?

Comment	**Responses**
Deer	4
Turkey	3
Grouse	2
Fish	1
Grassland Birds	1
Grouse	1
Wild Trout	1
Woodcock	1

3. How do you use BCGL?

Comment	Responses
Hunting	5
Hiking	2
Do Not Use	1
Exercise	1
Fishing	1
Wildlife Viewing	1

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

A summary of public input and responses is below.

Comment	Response
In general, access is fine. The only exception is a closed gate in the far north east area.	NCWRC does not have legal access to BCGL from S.R. 1504 (Walker Gap).
Construct a footbridge for crossing Joe's Creek at the parking spot on the C.C. Camp Rd. (S.R. 1574).	NCWRC plans to construct a footbridge at this access point to BCGL.
The Green Rock entrance is washed and rutted. 4WD is required for access.	NCWRC plans to pave this steep section of access road.
Need better access after deer season to predator hunt	The only gate that is closed after deer season is the one at the designated camping area. This gate is closed to protect a newly upgraded 2.7 mile section of road from excessive wear during the winter when the road is subject to freeze/thaw. Keeping this road open to public vehicular traffic during the winter is staff and cost prohibitive.

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

A summary of public input and responses is below.

Comment	Response
We would like it to remain as wild as possible but have habitats extremely conducive for the propagation of deer and turkey, yet not exceed what the acreage can support.	NCWRC will strive to maintain a balance of easy and challenging access to areas on the game land and will manage the habitat to support a variety of wildlife species, including deer and turkey.
If mountain biking were to become included in future management of this game land NWNC MTBA would like to be included in the discussions.	Mountain biking is currently unrestricted at BCGL. NCWRC welcomes assistance from organized groups.
NCWRC should implement more predator control.	Predator control is not feasible at the landscape level due to manpower limitations and regulations. NCWRC will continue to promote trapping and coyote hunting on game lands.
NCWRC should construct and/or plant more food plots. These should include both annual and perennial plantings.	NCWRC will continue to maintain existing food plots on BCGL and will develop new food plots as opportunities arise. Both annual and perennial cultivars are currently utilized on the game land and will continue to be in the future. Siting food plots on BCGL is challenging due to steep topography and relatively infertile soils. The current staffing level also limits the acreage of food plots that can be maintained/developed. In addition, the Natural Heritage Dedication also restricts the construction of new food plots in certain locations.
Proper habitat is crucial for ruffed grouse populations.	NCWRC will provide early successional habitat (ESH) and habitat diversity via forestry and other habitat management techniques on BCGL as directed by this management plan. Opportunities for forestry activities are limited due to steep topography and the Natural Heritage Dedication.
Plant chestnut trees for wildlife.	Seedlings will be planted if/when disease resistant stock becomes available

Conduct more prescribed burning.	NCWRC will continue to explore new areas/units for prescribed burning. Implementing additional prescribed burning is challenging due to lack of suitable burning days, manpower limitations, and prescribed burning activity on other regional game lands.
1,100 trout stocked per year is not enough. Is the natural food supply problematic to the sparse numbers being stocked?	NCWRC hatcheries are currently operating at capacity and cannot stock additional numbers of trout.

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

A summary of public input and responses is below.

Comment	**Response**
I believe the NCWRC should build outdoor archery ranges where people can shoot their bows when they arrive to the parking lot. This will attract people to the game lands and make them want to come back, because sometimes people drive a couple hours and want to shoot their bow but can't without bringing a target.	NCWRC will consider the construction of archery ranges.
Maybe turn some turkeys loose and give the turkey hunters more opportunity. There are turkeys there but its hit and miss as I have found out over the last 5 years	Wild turkey are present and established at BCGL. The stocking of additional wild turkeys would do little to increase population levels. Wild turkey population levels are a function of habitat quality. Releasing game farm turkeys is not a viable option due to disease concerns, costs, and manpower limitations.
Perhaps let us citizens help with projects on the game lands. I'd love to help improve the habitat and would feel a greater ownership in the land if I directly contributed.	NCWRC welcomes volunteer assistance.

Higher deer population	NCWRC will provide early successional habitat (ESH) and habitat diversity via forestry and other habitat management techniques on BCGL as directed by this management plan. Opportunities are limited due to steep topography and the Natural Heritage Dedication.

7. What additional comments do you have about BCGL?

Comment	**Response**
Introduce Tule or Roosevelt elk.	Current habitat conditions at BCGL would not support elk. Introduction of elk to the landscape is a complex topic of which the scope goes well beyond the boundaries of BCGL.
Do not allow ATVs.	ATVs are prohibited on game lands.
Post signs when burning or when doing timber mgmt. to explain the purpose of these activities.	NCWRC will explore additional ways to explain the benefits of habitat management to the public.

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

Comment	**Responses**
Deer Habitat	1
Food Plots/Open Areas	1
Early Successional	1
Properly Managed Pine Plantations	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 MRGL?

Comment	Responses
Deer	1

3. How do you use MRGL?

Comment	Responses
Hunting	2

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

No public input received.

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

A summary of public input and responses is below.

Comment	Response
Turn more turkeys loose to increase the population.	Wild turkey are present and established at MRGL and on the surrounding landscape. Wild turkey should become more numerous on the Little River Tract of MRGL as some of the timber matures and pine plantations are restored to more desirable habitat. The stocking of additional wild turkeys would do little to increase population levels. Wild turkey population levels are mainly driven by habitat quality. Releasing game farm turkeys is not a viable option due to disease concerns, costs, and manpower limitations.

I advocate planting something in the created openings other than cultivated legumes. There are plenty of native forbs and grasses that could be planted instead - big bluestem, blazing star, butterfly weed, indiangrass, etc. No non-native species should be promoted or planted on the game lands.	NCWRC utilizes native as well as non-native species in wildlife openings to meet both species/habitat management objectives and to provide optimal hunting locations for the public. Non-native invasive species are avoided when selecting cultivars.
Create more food plots.	NCWRC will continue to maintain existing food plots on MRGL and will develop new food plots as opportunities are presented. Siting food plots on MRGL is challenging due to steep topography and relatively infertile soils. The current staffing level also limits the acreage of food plots that can be maintained/developed. In addition, the Natural Heritage Dedication also restricts the construction of new food plots in certain locations.
I think it would be a good idea to build about a one acre pond on the creek. It would draw all wildlife as well as ducks and geese that would give those that like to bird hunt more opportunities.	Liability concerning the construction of a dam in this location as well as manpower limitations preclude the installation of a pond on MRGL. Negative impacts to native aquatic species are also a concern.
Create more early successional habitat like native warm season grasses and fallow fields managed through strip disking. Also conduct timber stand improvement in the Loblolly pine.	Additional ESH, including the establishment of native warm season grasses, will be provided as directed by the management plan. Approximately 900 acres at MRGL are in a prescribed burning rotation. Much the prescribed burning is directed at improving loblolly pine plantings. Additional timber stand improvement strategies will be conducted as the loblolly plantings increase in age.
I am an advocate of hunting on all days of the week on these lands.	Due to the relatively small size of MRGL and the lack of other sizeable public hunting areas in the immediate vicinity, NCWRC staff recommends maintaining MRGL as a 3 day per week game land. This management option diminishes the likelihood of excessive game harvest and promotes a quality hunting experience.

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

No public input received.

7. What additional comments do you have about MRGL?

No public input received.

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

Comment	**Responses**
Food Plots/Open Areas	4
Early Successional	3
Deer Habitat	2
Mountain Laurel	2
Aquatic	1
Grouse Habitat	1
Hardwood Forest w/Hard and Soft Mast	1
Oaks	1
Pitch Pine	1
Turkey Habitat	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 TCGL?

Comment	**Responses**
Deer	8
Grouse	5

Turkey	3
Songbirds	1
Woodcock	1

3. How do you use TCGL?

Comment	Responses
Hunting	7
Birding	1
Do Not Use	1

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

A summary of public input and responses is below.

Comment	Response
Access is too easy to some areas.	NCWRC will strive to maintain a balance of easy and challenging access to areas on TCGL. A segment of hunters prefers and/or require areas with good vehicular access, while other hunters prefer to hike a good distance from their vehicle before hunting. Since 2006, gate locations at the ends of 5 public access roads have been changed. This was done to eliminate the need for 8 gates, to stop vehicle access short of 3 wildlife openings and to close vehicular use in areas where vehicles regularly became stuck. These actions have eliminated a combined total of almost 1 mile of roads that were formerly open to public vehicular traffic.

Allow better access for late season predator hunting.	Approximately 11 miles of roads open for public vehicular traffic are open at TCGL from September 1 – March 1. Opening additional roads to public vehicular traffic in winter is not feasible due to freezing/thawing issues which lead to increased road maintenance costs and manpower requirements.
Better parking is needed when the Osborne Ridge Road gate is locked.	NCWRC will move the Osborne Ride Road gate to the kiosk location which is located a short distance from Longbottom Rd. Ample parking will then be available.
Public access is needed to D Section from Longbottom Rd.	NCWRC has no legal ROW easement from Longbottom Road to D Section. Historical public access was provided by a private landowner, but this was terminated by the landowner in the early 1990s. NCWRC has explored numerous avenues for providing this access without success. NCWRC will continue to seek public access to D Section.
More access points to TCGL are needed. There is a lot of private property adjacent the game land, making access difficult without trespassing.	NCWRC will acquire land for public access if/when those key properties are offered for sale and when funding for land acquisition is available.

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

A summary of public input and responses is below.

Comment	Response
I do not support management action primarily aimed at promoting white-tailed deer. Most private land in the state has a thriving deer population and provides hunting opportunity.	NCWRC strives to manage for a diversity of habitat types that support a wide variety of wildlife on game lands. Deer thrive where a variety of habitat types are provided and often are prevalent on game lands. While most private land in N.C. does support deer, not all hunters have access to private land for hunting. Game lands provide opportunity for hunting that these hunters may not have otherwise. This is especially true in northwest N.C. where little public land exists.
I advocate planting something in the created openings other than cultivated legumes. There are plenty of native forbs and grasses that could be planted instead - big bluestem, blazing star, butterfly weed, indiangrass, etc. No non-native species should be promoted or planted on the game lands.	NCWRC utilizes native as well as non-native species in wildlife openings to meet both species/habitat management objectives and to provide optimal hunting locations for the public. Non-native invasive species are avoided when selecting cultivars.
Coyotes should be eradicated.	Coyotes are well established in the southeastern states and cannot be eradicated. Predator control is not feasible at the landscape level due to manpower limitations and regulations. NCWRC will continue to promote trapping and coyote hunting on game lands.
Prescribed burning rotations should be longer.	NCWRC will establish burning rotations based on habitat management objectives and as directed by the management plan. Rotations will often be longer than 3 years.

Plant more food plots and plant food plots that require little maintenance.	Food plots are already located on most of the flatter areas at TCGL. Siting food plots on TCGL is challenging due to steep topography and relatively infertile soils. The current staffing level also limits the acreage of food plots that can be maintained/developed. Maintenance of food plots is typically labor intensive, and no plantings are maintenance free. NCWRC will continue to maintain existing food plots on TCGL, will develop new food plots as opportunities are presented, and will implement new technologies as they are developed.
Implement restrictions to manage for trophy bucks (i.e antler restrictions).	Very little interest for implementing antler restrictions was received via public comment. Deer hunting regulations at TCGL are set to ensure that deer are not overharvested and that the herd remains healthy. Hunting is not permitted on the adjacent Doughton Park and Stone Mountain State Park. Natural movement of deer from these 2 unhunted areas provides opportunity for harvesting a trophy deer. Additionally, some of TCGL can only be accessed with significant foot travel. This minimizes hunting pressure on portions of the game land, also enhancing the opportunity for harvesting a trophy deer.
Limit the number of hunters during muzzle loader season & turkey season. No small game hunting should be permitted during deer season.	Very little interest in permit hunts was received via public comments. TCGL is approximately 6,500 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 TCGL, or to continue using it more actively?

A summary of public input and responses is below.

Comment	Response
Provide more access for younger and older hunters.	NCWRC currently provides approximately 11 miles of roads seasonally open to public vehicular traffic on TCGL. This should provide ample access to hunters of all ability levels.
We need deer numbers like there were 20 years ago.	The deer herd on TCGL as well as on surrounding private lands has declined in the past 20 years. This deer herd was likely maintained at too high of a level by restrictive hunting regulations and some of the decline in deer numbers is related to changes in hunting regulations designed to create a lower density and healthier herd. Additionally, TCGL was near the epicenter of the regional EHD outbreak in 2012 and the deer herd continues to recover from that event.

7. What additional comments do you have about TCGL?

Comment	Response
Have a permit bear hunt a couple times a year.	TCGL has been a bear sanctuary for many years. When this sanctuary was established there were few bears in northwestern N.C. Over the past 30 years the bear population has greatly increased in this area, TCGL included. NCWRC will continue to examine individual bear sanctuaries and the need for their continued existence. Bear hunting may be implemented on some sanctuaries in the future.