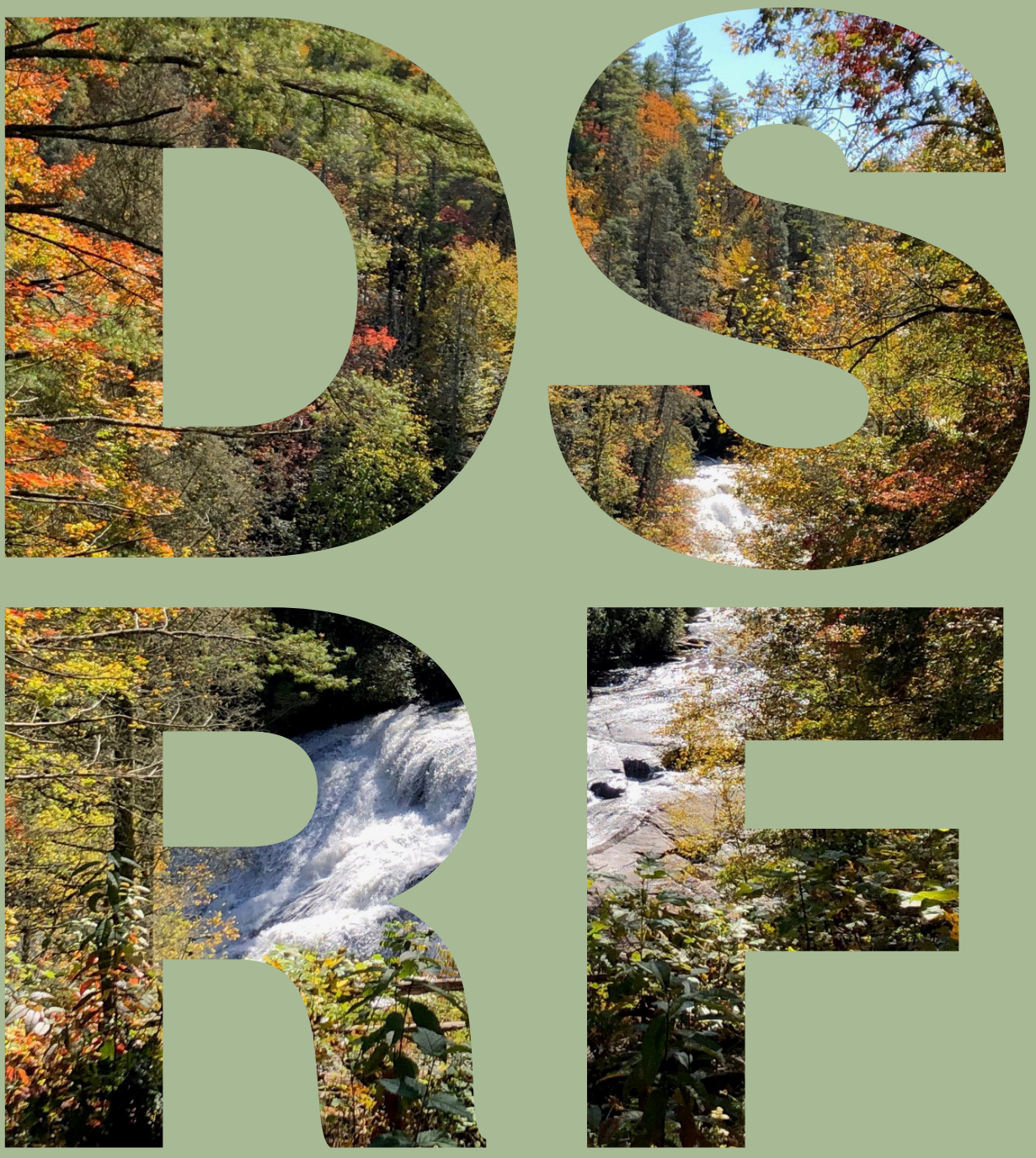
DuPont State Recreational Forest

Master Recreation Plan | November 2024



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Master Recreation Plan | November 2024

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Members of the DuPont State Recreational Forest Advisory Committee

Henderson County Tourism Development Authority

Transylvania County Tourism Development Authority

Focus Group Attendees

Summer 2023 Volunteers Who Administered Parking Lot Surveys

Transylvania Parks and Recreation Department

Henderson County Library

Transylvania County Library

Glenn C. Marlow Elementary School

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Introduction

1 Introduction

1.1 General Benefits of DuPont State Recreational Forest

State forests play a vital role in any community and region. DuPont State Recreational Forest (DSRF) fulfills its mission statement of providing "an exemplary model of scientifically sound, ecologically based natural resource management for the social and economic benefit of its diverse community users." Through its mission the Forest can provide many benefits that aid in natural resource preservation, recreational opportunities and economic development[1]. These include:

Recreational Opportunities: The Forest offers a diverse array of recreational activities including hiking, mountain biking, horseback riding, fishing, hunting and picnicking. With 81 miles of multi-use trails and roads, visitors have many opportunities to enjoy the natural beauty of waterfalls, forest and scenic trails.

Outdoor Education: The Forest offers free opportunities for educational programming for visitors of all ages and promotes awareness and appreciation of the natural and historic world. The topics typically covered are forest ecology, wildflower identification, tree identification, the history of DSRF and much more. These programs can be customized to meet the needs of a specific group and can be scheduled with Forest staff throughout the year.

Public Health & Well-Being: The Center for Disease Control and Prevention (CDC) states "Exposure to nature or green space also has positive physical and mental health benefits, including lower rates of heart disease, stroke, obesity, stress and depression[2]." As a state forest, DSRF's trail infrastructure is equal to the equivalent of about 13% of the trail miles within the entire North Carolina state park system[3]. These trails provide access to recreational opportunities and landscapes allowing for users to receive the health benefits associated with exposure to a natural setting. In addition, it is estimated that the Forest absorbs 30,000 tons of carbon dioxide each year contributing to environmental and health benefits for the region.

Economic Impact: The presence of the DSRF contributes to the local economy in several ways such as providing employment within the Forest, timber harvesting, attracting visitors, supporting tourism-related business and creating job opportunities in the recreation and hospitality sectors. Due to the unique natural and recreational resources within the Forest, it has become an economic resource for tourism-based businesses that offer various experiences including guided horseback rides, guided fly fishing opportunities, walking tours and guided mountain biking rides. The Forest is often used as a film location bringing external economic opportunities to the surrounding area. It was the filming site for several popular movies such as *The Hunger Games* and *Last of the Mohicans*[4]. In addition, the volunteers who donate their time to assist the Forest with visitor center tasks, trail maintenance, trail repair, the invasive plant program and the hemlock restoration initiative results in economic savings of about $156,500 a year.

Ecological Protection: The Forest plays a vital role in supporting biodiversity for the region by protecting wildlife habitats and preserving natural ecosystems. With 63% of the DSRF contained within a dedicated nature preserve, it is the location of 22 rare natural communities, some of which are unique on a national and global scale[6].

Scenic Beauty: The picturesque landscapes, waterfalls, rivers, lakes and forests of DSRF offer aesthetic value and opportunities for photography, nature appreciation and scenic exploration. The most popular sites within the Forest include Hooker Falls, High Falls and Lake Imaging access areas which had a total car count of 985,952 in all three parking areas combined in 2021, accounting for approximately 73% of the 1,357,000 visits recorded that year[5].

Community Engagement: The Forest serves as a gathering place for community events, outdoor festivals, volunteer programs and recreational activities that foster social connections, community involvement and a sense of place. Some of the events are hosted by the Friends of DuPont Forest, such as litter pickup, trail crew workdays, plant identification hikes and the annual DuPont Forest Festival. Visitors can also apply for a Special Use Permit to hold an event such as a wedding, business gathering or ceremony within the Forest. These events can be held at the Guion Farm Picnic Shelter and surrounding open space. Visitors are also able to host small events by renting one of the five picnic shelters within the Forest[6]. In addition, the Forest cultivates a sense of community and ownership through its volunteer programs. Currently, DSRF has 35 volunteers working at the visitor center contributing 2600 hours per year in service and receives roughly 2321 volunteer hours for trail maintenance and repair per year.

Water Resources: The Forest is home to 71 miles of protected streams, 6 waterfalls and 5 lakes[6]. These water resources contribute to watershed health, water quality improvement and preservation of aquatic habitats.

Cultural Heritage: With a history dating back to the 1800s, DSRF has historical significance and cultural heritage value[7]. DSRF reflects on the region's past land use and the transition to public recreational use.

Stewardship & Conservation: Protection and promotion of the long-term integrity of natural communities drive the forest management program at DSRF, which has become renowned for demonstrating the concepts of multiple use and sustainability when managing natural resources using, mechanical, biological and chemical methods. The DSRF forest management program seeks to increase species and forest diversity, maintain forest health, protect water quality and enhance terrestrial and aquatic habitats.

Overall, the DSRF offers a multitude of benefits that enhance quality of life, support environmental conservation, promote outdoor recreation and contribute to the well-being of both individuals and communities.

> "Just as water, sewer and public safety are considered essential public services, parks (and forests) are vitally important to establishing and maintaining the quality of life in a community, ensuring the health of families and youth and contributing to economic and environmental well-being of a community and region.
>
> There are no communities that pride themselves on their quality of life, promote themselves as desirable location for businesses to relocate, or maintain that they are environmental stewards of their natural resources, without such communities having a robust, active system of parks and recreation programs for public use and enjoyment[8]."

- National Recreation and Park Association, Why Parks and Recreation are Essential Public Services

1.2 Public Appreciation for the Forest

Since 2012, DSRF has seen significant increases in annual visitation. Visitors have gained a greater appreciation for various aspects of the Forest such as the natural environment, outdoor recreational opportunities and the preservation of wildlife habitats. In 2012, the Forest recorded 300,000 visits and has experienced a somewhat steady increase throughout the last 10 years. DSRF experienced a large spike in visitations in 2016 recording 1,047,000 visits that year which was almost double the quantity estimated in 2014[1]. In addition, with the onset of COVID-19 in 2020, this interest increased even further. The Forest's visitation patterns were significantly affected as more and more people consistently turned to outdoor activities for leisure and exercise. The years following the outbreak of the global pandemic revealed that as social practices returned to normal, DSRF continued to receive greater quantities of visitations annually. In 2021, the Forest witnessed its largest number of annual visitations in the last 10 years with a record 1,357,000 visitations ***(see Figure 3-1)***[1]. This surge in visitation has impacted DSRF in several ways including the increased wear and tear on trails, greater demand for infrastructure and facilities and potential environmental impacts due to high user levels and human presence in ecologically sensitive areas. As a result, DSRF has had to adapt its management strategies to accommodate the increase in visitation while preserving the natural resources and ensuring the sustainability of the Forest.

The increasing popularity of DSRF presents both opportunities and challenges, including managing high use impacts, enhancing infrastructure and balancing recreational access with conservation priorities. Sustainable planning and resource allocation are essential for addressing high use dynamics. To manage the substantial increase in visitation, the Forest has and will continue to implement various strategies to accommodate the recreational demands while preserving the natural resources and ensuring the sustainability of the Forest for future generations. These management strategies include:

The Master Recreation Plan

The primary focus of this report is to create a strategic plan for DSRF's recreational infrastructure to improve economic, social and environmental sustainability in response to the high level of visitation the Forest receives annually. The report will provide a strategic plan based

Hooker Falls High-Use Area

on input from user groups, trail density analysis, Forest employee input and wildlife management and natural resource preservation objectives. In addition, sustainably focused management strategies will be provided to ensure economic, social, ecological and historical resources are preserved for future generations, minimize user group conflicts and prevent negative user experiences due to high visitation levels.

Evaluation of Recreational Impact

Forest personnel continuously evaluate the impact of permissible recreation uses and re-examine regulations if negative impacts become apparent from recreational activities. These and future strategies recommended in the master plan report will continue to enable DSRF to effectively manage and respond to the substantial volume of visitation to the Forest while preserving its natural resources and ensuring a quality experience for all users.

1.3 Plan Origin & Planning Process

In 2021, DSRF was awarded funds by the North Carolina General Assembly to generate and incorporate a master recreation plan for the 12,489-acre forest[9]. The purpose of the Master Recreation Plan was to review the 81 miles of multi-use trails and roads, existing facilities and existing recreational opportunities that are utilized by users for either equestrian, hiking, trail running, hunting, fishing and mountain biking activities. Legislation required the plan to collect information regarding the Forest's trail and user density, public input, natural resource preservation goals, economic goals and wildlife management in order to construct a plan for the sustainability of the DSRF's recreational infrastructure[9]. Through this process the planning team would construct a report that provides recommendations for the Forest focusing on new and extended trails, trail system management, trail closures, trail improvements and consolidations, trail sustainability, future recreational opportunities and opportunities focused on new and existing properties. The report would provide a special focus on management and practices that limit the impacts of high use areas within the Forest.

In February 2023, DSRF signed a contract with the planning team consisting of Mattern & Craig—a local engineering and surveying firm, Arcadis—a landscape architecture and master planning firm, C2 Recreation Consulting—a trail design firm and Terra Incognita - a trail specialists firm, to complete a Master Recreation Plan. In the months that followed the consultants developed and implemented a comprehensive planning approach to meet the requirements of the legislative mandate ***(see Figure 1-1)***[9].

In June 2023, the Friends of DuPont Forest donated $100,000 in funding to the planning project in order to expand the scope of work to include regional trail analysis, recreational trend analysis and the review and recommendation of conceptual programming for the Lake DERA area, Cascade Lake area and Continental Divide area[10]. The funding for the plan was achieved through several grants from the Henderson County Tourism Development Authority and the Transylvania County Tourism Development Authority grant program known as Transylvania Always. The development of these deliverables was integrated into the planning process by the consultant into the original ongoing public input process that included public input meetings, focus group interviews and public surveys.

The planning process began on March 6, 2023, with a kick-off meeting held with DSRF representatives at the Forest's Visitor Center. Over the following months, site visits were conducted to document existing conditions throughout the Forest. The preparation of the Master Recreation Plan utilized an open planning process to gain public comment across an array of platforms. Such platforms included online and in person surveys, public input session workshops and focus group interviews.

Surveys were developed to gather community input on existing facilities, trails and roads, concerns, priorities and opportunities for future prospects. The surveys were distributed in both online and paper format with either an online link or distributed in DSRF access area parking lots. The online surveys were available between April 16th and September 25th of 2023, and the parking lot surveys were available July 23rd through August 15th of 2023. At the end of the survey process, 3,515 online surveys and 164 parking lot surveys were filled out and collected and the results were tabulated.

Figure 1-1: Legislative Text for the Funding of the DSRF Master Recreation Plan (N.C. Senate Bill 105-2021 Appropriations Act)

DUPONT STATE RECREATIONAL FOREST FUNDS

SECTION 10.5C.(a) Nonrecurring funds appropriated in this act to the Department of Agriculture and Consumer Services for creation and implementation of a master recreational facility plan for the DuPont State Recreational Forest (Forest) shall be allocated as follows:

(1) Two hundred thousand dollars ($200,000) for the 2021-2022 fiscal year for the creation of a master recreational facility plan that includes planning for the recreational infrastructure and network of trails within the Forest with input from potential user groups, desired experiences for those groups, trail density analyses, and other Forest, wildlife management, and natural resource preservation objectives. The plan will also include recommendations for trail system management, new and extended trail segments, improvements, trail consolidation, and trail sustainability measures, and management measures for purpose-built trail systems and for mitigation of trail impacts due to high visitation.

(2) One hundred thousand dollars ($100,000) for the 2021-2022 fiscal year and four hundred fifty thousand dollars ($450,000) for the 2022-2023 fiscal year for the implementation of the facility plan, including engineering, design, maintenance, and construction activities for new and existing trails, trail support facilities, and recreational facilities. Of these funds, the Department may use no more than two hundred twenty-five thousand dollars ($225,000) for the planning, design, and implementation of a trail spur connecting the Forest to the French Broad River Paddle Trail and to the Palmetto Trail and other trails in South Carolina.

Public Input Drop-Ins (PIDIs) were held in May, July and November of 2023 to present tabulated survey and session results, information collected on the Forest, conceptual opportunities and changes and gain input on recreational needs and priorities from the public. By the end of the third public input meeting 477 participants had signed in and 390 comments were recorded. A final public meeting was held again in April of 2024 to present and gain input on the draft Master Recreation Plan.

Between May 2023 and April 2024, the planning team studied existing conditions, analyzed trends and projections, collected public feedback, developed conceptual recommendations and developed financial strategies for plan implementation. The following bullets summarize the steps taken by the planning team during this time:

- Collected and evaluated information related to the inventory of existing forest management projects and facilities.
- Collected and evaluated information regarding existing recreational programs and facilities provided by other groups such as focus groups, public, voluntary and community facilities.
- Identified and evaluated the adequacy of facility programs and uses and the potential for expansion.
- Collected and evaluated information related to past and projected changes in the Forest and surrounding population and demographics.
- Compared existing recreation land and facilities offered by similar state and national forests and parks. Using these comparisons, prepared a summary of current Forest shortfalls and future needs.
- Gathered public input on forest needs through public opinion surveys, public meeting and interviews.
- Prepared recommendations for refurbishment and expansion of existing trails and roads, trail maintenance practices, trail additions, trail closures and additional conceptual facilities and programs.
- Prepared recommendations for capital improvements for the short term (1-5 years), mid-term (6-10 years) and long term (11-15 years).

The recommendations of the master recreation plan were finalized prior to the extensive damage to DSRF by Tropical System Helene in September 2024. The implementation of the recommendations may be adjusted as the DSRF staff adapts to the conditions that exist post-Helene, as there was significant damage to areas, trails and roads across the Forest.

1.4 Precedent Planning Studies Reviewed

Several other planning studies provided guidance and insight during the planning process. The documents and efforts were valuable tools during the development of the DuPont State Recreational Forest Master Recreation Plan. Those documents included:

- DuPont State Recreational Forest Resource Management Plan (2011)
- N.C. Department of Agriculture and Consumer Services—Plan for Entry Fees to Support the Financial Stability of DuPont State Recreational Forest (2021)
- Property Control Plan—Brevard Site Cedar Mountain, North Carolina (2017)
- Remedial Investigation Report—DuPont Brevard Facility Cedar Mountain, North Carolina (2015)

Through review of the above-mentioned planning documents, the planning team identified the below areas of focus that will be included in the following Master Recreation Plan:

- Primary focus on DSRF objectives
- Regional context & Forest history
- Information gathering process
- Evaluation of existing trails & recreational infrastructure
- Presentation of public input information
- Concept Plans
- Recommendations
- Recommendation cost estimates
- Feedback & revisions from the draft plan presentation

Executive Summary

2 Executive Summary

2.1 History

DuPont State Recreational Forest (DSRF), located in Western North Carolina in Henderson and Transylvania counties near the town of Brevard, has a rich history that has shaped its evolution into a beloved outdoor destination. Before the land became a North Carolina state forest it went through periods of being owned by the Thomas, Moore and Hooker families[11]. Portions of the property became sites for farmland, the Buck Forest Inn, a grist mill, the Buck Forest Lodge, a cemetery, a caretaker house, a barn and several lumber mills. Throughout its history the land has consistently been used for timber harvesting, lumber mills and controlled wildfires. In the 1950's, over 10,000 acres were purchased by DuPont Corporation. Five years later a silicon chip manufacturing plant was opened on the site which began manufacturing X-ray film in 1958.

In 1996, DuPont Corporation sold its diagnostic imaging business to Sterling Diagnostic Imaging which included 2,200 acres along the Little River containing Triple Falls, Bridal Veil Falls and High Falls. During this time the state of North Carolina purchased 7,600 acres from DuPont Corporation and established DSRF[7]. Three years later in 1999, Sterling Diagnostic Imaging placed the 2,200 acres for sale which was pursued by the state; however, it was eventually purchased by a private residential housing developer. By 2000, several community groups, including Friends of the Falls, the Sierra Club, the public and Sterling Diagnostic Imaging urged the State to protect the area surrounding the falls and continue to allow public access. The North Carolina Council of State and then Governor Jim Hunt began negotiations with the private developer, and by October 23, 2000, the governor and Council of State proposed the invocation of eminent domain on the property, and it was unanimously approved.

The parties whose effort made the Forest's growth possible included Sierra Club, Friends of the Falls, landowners, federal, state and local governments and other conservation non-profit organizations[7]. In 2000, the state officially acquired the land that makes up the famous waterfall corridor in DSRF today, further establishing it as one of the region's natural attractions. The Forest is managed by the North Carolina Forest Service primarily for natural resource protection, scenic enjoyment and recreational purposes. Local communities and stakeholder groups continue to be involved in the Forest's management through public input, engagement and educational programs.

Following its establishment as a state recreational forest in 2011, DuPont underwent significant development to create recreational facilities, trails and amenities for visitors. The Forest's iconic waterfalls, including Triple Falls and High Falls, became popular attractions for hikers, photographers and nature enthusiasts. The Forest has gained national recognition as a premier outdoor destination, drawing visitors from across the county to experience its scenic beauty and diverse recreational opportunities. In addition, the Forest's appearance in films and television shows such as *The Hunger Games* and *The Last of the Mohicans* has further increased its visibility and appeal[4]. At the time of the development of this report, DSRF is currently 12,489 acres in size and has an average annual visitation of over 1,100,000 people[1].

The history of DSRF reflects a legacy of conservation, public access and environmental stewardship that continues to make it a treasured natural retreat for outdoor enthusiasts and nature lovers alike. Its evolution from industrial land to a pristine recreational area underscores the importance of land preservation and sustainable management practices to create and maintain valuable natural spaces for future generations to enjoy.

2.2 Legislation

In 2021, DSRF was awarded funds by the North Carolina General Assembly to generate and incorporate a master recreation plan and hired a planning team to assist their efforts ***(see Figure 1-1)***[1]. The plan will guide DSRF to prioritize future needs, improvements to existing facilities, programs and trails, as well as financing and managing strategies to maintain and improve the Forest and its recreation resources.

2.3 Report Overview

The Master Recreation Plan incorporates national, regional and local recreation information to provide insight into the existing conditions, future programs and strategies and increased visitation rates. The large increase in annual visits over the last ten years mirrors that seen in national trends. The United States has experienced increased interest in outdoor recreation, participation in hiking, fishing and biking and in the number of new participants in outdoor recreational activities[12]. In addition, the surrounding regional communities are experiencing increases in population and median incomes[13]. These trends help to explain the increase in visits to DSRF. The plan also goes into detail about the existing regional context of DSRF. Many well-known national parks and forests, state parks and forests and regional trail systems are within just a few hours' car ride. Due to the proximity of other attractions to the Forest, it is understood that this region is well known for its outdoor recreational opportunities and assets making it a frequently visited location. DSRF offers many of these recreational opportunities within its boundary such as hiking, trail running, horseback riding, mountain biking, hunting and fishing as well as scenic views and waterfalls making it an extremely popular destination in the region[6]. It was also determined that DSRF experiences a much higher level of use per acre of land compared to many popular protected lands such as Great Smoky Mountains National Park and South Mountains State Park. Due to the Forest's popularity, there are several areas of concern resulting from the high level of use. These areas were identified through a needs assessment and public engagement that focused on the Forest's recreational facilities and trail network.

The process utilized to acknowledge the complexities of the Forest included a national and regional trends analysis, an examination of field conditions and extensive public engagement. The public input process was initiated in several stages and focused on the collection of information at national, regional and local levels. Online surveys were introduced; three Public Input Drop-Ins (PIDI) were conducted to discuss survey and previous input session results and collect additional information; interviews were conducted with stakeholders, civic organizations, DSRF staff and user focus groups; and results and progress updates were presented to both DSRF staff and stakeholders. Comparisons were made to similarly managed natural resources within the nation, region and local communities. The information from these steps of the planning process became the basis for a needs assessment to determine existing and future needs of the Forest. The assessment included a prioritization of improvements to be made in the short term, medium term and long term within the next fifteen years. The plan elements were then graphically depicted in draft concept plans and information maps. Below are the overarching takeaways the planning team received during the entirety

Public Input Drop-In #1 at the Transylvania County Library, May 5, 2023

of the public input process with more weight given to local feedback due to the finding that the high visitation rates were greatly impacted by local residents' repeat visits. In addition, during the first and second PIDIs, the planning team gathered information specifically to distinguish preferences for each of the four user groups for their top-ranked trails, access areas and points of interest. The analysis of this information carried weight during the recommendation phase to best balance the impacts of proposed recommendations between all user groups. The results below are from all participants provided during the public input process. ***To see user group preferences for ranked trails, points of interest and access areas see Section 6.2.3—User Group Preferences.***

Concentrated Areas

- High Use Trails: The top three responses regarding the most-visited trails included Jim Branch, Reasonover Creek and Ridgeline Trail.
- High Use Points of Interest: The top three responses regarding the most-visited points of interest included the interconnected trail system, Triple Falls and High Falls.
- High Use Access Areas: The top three responses regarding the most-visited access areas included Lake Imaging, Guion Farms and Corn Mill Shoals.

Public Priorities

- The need to protect ecological integrity and character of DSRF natural communities.
- The need for the Forest to focus on reduction of erosion and sediment into streams and rivers, the improvement of wildlife habitat for game and non-game species and the protection of native plant and animal species.

Public Concerns

- The need to reduce negative impacts of recreational activities on the long-term ecology of the Forest.
- The need for DSRF to be able to maintain trails at their current level of use.
- The need to reduce the occasional user group conflicts on a small number of trails within the system.

Public Outlook for Future Opportunities

- A need for additional recreational programming such as kayaking and paddle boarding.
- A need to disperse users through the creation of additional access to new properties.
- A need for access to regional trails to increase connectivity to other natural assets within the region and provide additional recreational opportunities.
- A need for clearly defined ADA accessibility opportunities.

Focus Group and Stakeholder Group Priorities

- Improve awareness of "Forest Rules".
- Encourage the enforcement of rules & regulations.
- Provide visitor center renovation.
- Provide education to enhance safety & visitor awareness.
- Develop strategies to enhance "Good Behaviors".
- Address safety concerns at the waterfalls.
- Encourage a "Leave No Trace" mentality.
- Provide parking lot trash cans.
- Provide signage about dogs (i.e., "Keep dogs on leash").
- Provide information for visitor preparedness (i.e., "There is no potable water in DSRF").
- Encourage visitors to stay on the trail (i.e., "Be in nature ON the trail").
- Keep the Forest as natural as possible.
- Maintain public access to DSRF.
- Communicate the reasons why trail management (direction, designation, closure, addition) may change.

Draft recommendations and concept plans were presented to the public and participants were asked for their input on the suggested elements of the plan. Once these suggested elements had been confirmed, the planning team determined probable costs associated with these plan elements. An analysis was made of the state jurisdiction's financial capability to fund the planned improvements and strategies were developed to best leverage local resources, grant opportunities and long-term debt. An evaluation was also made of the Forest's programs, organizational structure and management capabilities. These elements were examined and this culminated in the final recommendations of the plan.

The recommendations of this plan include providing improvements for the Forest's trail system and enhancement of management practices, facilities and recreational opportunities to provide users and staff with a high-quality experience and to address the high level of use currently present within the Forest. The recommendations are grouped into two categories - one focused on physical improvements and the other focused on organizational, management and long-term maintenance improvements. ***See Section 4—Trails and Section 9—Recommendations for additional information on each one of the following recommendations.***

CATEGORY 1: EXISTING & FUTURE FACILITIES

Prioritize Deferred Maintenance

With 74% of the DSRF trail network requiring significant, frequent and professional maintenance it is recommended that the Forest focus on addressing these maintenance concerns prior to the pursuit of any new initiatives or expansion projects. It is recommended to prioritize high-use areas such as the waterfall corridor as it receives nearly one million trail users a year and is an important economic driver for tourism in the region. Maintenance approaches should be sustainable in their design, use of labor and funding sources. Although these approaches will be expensive and time-consuming they should be a priority for the Forest's allocation of time and resources. Hardened infrastructure should be implemented to allow for long-term health and safety of the visitor experience as well as preserving the character and ecological integrity of the unique and protected habitats. ***See Section 9—Recommendations for a list of common approaches that DSRF could implement to expedite professional engagement for maintenance and building needs. See Section 4—Trails for complete assessment of recommended trail maintenance.***

Americans with Disabilities Act (ADA) Accessibility Opportunities

It is recommended that DSRF increase public awareness of ADA recreational opportunities through additional signage and online information on the DSRF website. In addition, it is recommended that additional ADA-accessible recreational opportunities be provided. The addition of recreational resources will increase the diversity of users within the Forest. Increasing awareness and opportunities will assist DSRF in the long term in determining the balance between the practicality and affordability of creating ADA conditions in natural areas.

Upgrades to Existing Recreational Infrastructure

Through the needs assessment process the planning team compared DSRF use levels and infrastructure to those found in national parks and forests. It is recommended that DSRF implement similar trail infrastructure to those found in national parks and forests that are capable of withstanding the high levels of use the Forest has been receiving over the last few years. Hardened infrastructure will play the largest role in creating a sustainable trail network as it will take the inadequately constructed trails DSRF currently has and create an infrastructure that will be capable of handling the current levels of high use. This significant capital investment that will be necessary for the long-term sustainability of the Forest. The current Forest practices of quick fixes are due to limited staffing and funding constraints; this approach is not environmentally, socially or ecologically sustainable as maintenance must be consistently repeated in the same locations. It is recommended that the Forest prioritize the allocation of necessary funding for the implementation of this hardened sustainable infrastructure of existing high-use trails to provide long-term solutions, infrastructure that can handle the high level of use, minimize staff efforts related to maintenance and greatly improve the Forest's sustainability. ***See Section 4—Trails for additional information regarding upgrades such as hardened trail infrastructure.***

Upgrades to Educational Materials

Signage related to trail etiquette and environmentally conscious behavior already exists at each access area and at certain road and trail intersections, however, to make this information more easily understood by Forest users it is recommended that signage be improved upon. This could include making fonts and images larger or in brighter colors to attract visitor attention or adding supplemental signage regarding items such as leash law or leave no trace. The Forest can take this information sharing a step further by providing additional educational materials to be shared with the public through social media or videos posted to the Forest website. In addition, the Forest can work with non-profit organizations to share this information or provide workshops that give users more detailed information about how to safely and respectfully use the Forest. The addition of educational information sharing can reduce conflicts between user groups and reduce the occurrence of injuries. In addition, the Forest currently has some educational signage that focuses on the Forest's environmental, social, cultural or historic assets located throughout the Forest. It is recommended that more signs be located and installed as this will add to the user experience, increase awareness of DSRF assets, gain support for Forest initiatives and increase user investment in the Forest as a whole.

Expansion of Existing Recreational Infrastructure

It is recommended that DSRF have reached a sustainable level of maintaining current infrastructure and have implemented the majority of the recommendations described in Section 4—Trails prior to the expansion of existing infrastructure be undertaken with additional and adequate personnel and funding resources. The staff required for the development and access to these three properties and potential regional connector trails will need to include additional staff within the maintenance, recreation and law enforcement DSRF departments as well as seasonal staff to manage the very highly impacted areas. ***See Section 6—Needs Assessment for details***. Without this additional staff, these areas could not be

From left: DuPont State Recreational Forest Multi-Use Instructional Signage; Lake DERA

maintained, meet recreational needs or ensure visitor safety. Most public input indicated that the public was satisfied with the variety of recreational opportunities within DSRF, but the Forest could benefit from additional recreational areas and programming as it could assist with drawing visitors to alternative areas within the Forest and potentially relieve some of the high-use areas. The properties and programming recommended in this plan are listed below. ***See Section 7—Concept Plans for additional information about these future expansion areas.***

Lake DERA: The portion of the Donut Hole near the northern edge of Lake DERA is recommended to be opened to the public as a day-use recreational area. At the time that construction begins for the site it is recommended that required staff be allocated for site operations and management. This space would include recreational programming such as gathering pavilions, paddle boarding, parking, kayaking, picnicking and fishing. It is also recommended that an ADA walking path be constructed along areas of Lake DERA to provide additional accessibility opportunities.

Cascade Lake: This property provides opportunities for conceptual programming such as scenic enjoyment, an undeveloped experience area, hunting opportunities and a natural heritage area. It is recommended that DSRF make the final decision on the programming for this property and at that time staff should allocate funds and personnel for the development of certain recreational elements. Once development has begun, all trail maps should be updated to include new access areas and points of interest. It is recommended that DSRF share the programming elements of this area with the public either through updating the DSRF website or making a social media or public announcement.

Continental Divide: This property provides opportunities for conceptual programming such as a hunting area, less-developed experience area, new trails, potential regional trail connector points and a natural heritage area. It is recommended that DSRF make the final decision on the programming for this property and at that time staff should allocate funds and personnel for the development of certain recreational elements. Once development has begun, all trail maps should be updated to include new trails, access areas and points of interest. It is recommended that DSRF share the programming elements of this area with the public either through updating the DSRF website or making a social media or public announcement.

Regional Trail Connections: DSRF is located in a prime location that could allow for the potential connection to one or more of the five surrounding regional trails which include the Ecusta Rails-to-Trails Trail, Palmetto Trail, Foothills Regional Trail, French Broad River Paddle Trail and the Mountains-to-Sea Regional Trail. If interest is expressed from an organization leading one of the five regional trail efforts to connect to DSRF, it is recommended that the Forest should prepare for any expected needs, management requirements, staffing requirements, growth of regional trail organization relationships and additional infrastructure if any regional trail connections become a reality. A connection to a regional trail could provide additional recreational opportunities for DSRF and regional trail users and provide potential tourism and economic benefits for the surrounding region.

CATEGORY 2: PROGRAMMING, ORGANIZATION & POLICY INITIATIVES

Addition of Full-Time Staff

DSRF does not currently have an adequate number of recreation-focused personnel to maintain the trail system and implement the trail-specific recommendations of this plan. The addition of full-time positions to focus on trail management and equipment operations is a critical need for the Forest. It is recommended that two full-time staff positions be created. One of these positions will be a trails-based position which will focus on tasks such as further support and coordination for trails and will lead the expansion of Volunteer Trail Crew efforts. The other position should be an equipment-based position for trails and recreational infrastructure. This position will focus on tasks such as increasing the capacity to address resource degradation and trail maintenance in response to high visitation counts and visitor impacts on trails. The addition of two full-time staff will allow for the following needs to be met:

- Current and existing needs of compounding deferred maintenance, resource degradation and critical fixes for visitor safety and resource protection.
- To eventually achieve a sustainable state of planning and maintenance where the Forest can handle an expansion of the current trail and recreational infrastructure called for in this plan.

In addition, for recommendations and maintenance needs that require professional trail assistance, it is recommended that the Forest seek efficient procurement processes to maximize use of current funding sources, future appropriate and donations. Contracts for trail renovation and maintenance should be adaptable and streamlined to further reduce implementation timelines to continually reduce deferred maintenance and avoid future trail conditions that require extensive repair and renovation. It is also recommended that DSRF incorporate annual funding sources for basic cyclical trail maintenance to handle the recurring wear and tear and high-level visitor impacts on the trail system. Lastly, DSRF should maintain the local ability to make future decisions about trails and less developed roads that are integral to the trail network. It is recommended that these trail-based decisions should align with the three pillars of sustainability used as guideposts throughout this plan. ***See Section 9—Recommendations for additional information on additional full-time staff positions to address current and future needs.***

Increase Trail Maintenance Funding & Expedite Review Procedures

It is recommended that DSRF explore various funding avenues in addition to grants such as partnerships, sponsorships, or crowdfunding to enhance financial stability alongside grant income. Unfortunately, the current main source of funds from the Parks and Recreation Trust Fund often does not cover the costs of routine maintenance. Since DSRF is in a constant cycle of trail maintenance and repairs they are unable to allocate these funds towards these objectives. It is recommended that DSRF receive a maintenance budget for trails of $225,000 annually. This amount would allow for $45,000 of maintenance per trail mileage to perform maintenance on five miles of trail a year. It is also recommended that a streamlined process be put in place that allows DSRF to create trail contracts for primarily maintenance-based work without extensive design review.

Although these reviews are beneficial, they significantly slow down the process of applying funds to many small capital improvements and routine maintenance that would be performed by professional trail builders. Extended review periods results in funds not being utilized and maintenance issues persisting that result in issues for visitors and DSRF staff. ***See Section 9—Recommendations for additional information on the diversification of funding sources and expediting review procedures.***

Continue with Natural Area Protection Efforts

It is recommended that the Forest prioritize natural area protection and use this prioritization as the primary base for the decision-making process for all recreational development. This prioritization should be sustained during times of high external pressures to ensure environmentally unsustainable proposals are not pursued.

Buck Forest Road Controlled Burn

DSRF Timber Harvesting

Greater Utilization & Partnerships with Volunteer Organizations

With several user groups providing volunteer labor and expertise for DSRF. It is recommended that when volunteers are utilized for trail work, they should be properly trained, and a pool of volunteers be established so that trail work can be completed in an efficient and timely manner. The use of volunteers provides several benefits for the Forest such as the creation of a sense of ownership and engagement, reduction in maintenance costs and educational opportunities. It is recommended that the Forest continue building the partnership already established between volunteer organizations as well as expand their relationship network to form a larger group of volunteers to assist with Forest needs and trail maintenance.

Communicating New Trail Management Objectives

Introducing new trail management practices to the public requires a thoughtful and comprehensive communication strategy to ensure understanding, acceptance and compliance. ***See Section 4—Trails for a list of actions that are recommended to be taken to ensure the objectives are communicated efficiently and that input from the public is considered.***

Commit to a System-Wide Implementation of Trail Recommendations

Due to high-use areas, high levels of maintenance needs and to make a more cohesive trail network it is recommended that some trails would function better if categorized as either directional and/or assigned designation. In Section 4—Trails of this plan, the recommended management practices are laid out to identify the best steps towards either trail designation, direction, closure or addition. It is important to note that all recommendations are considered a cohesive whole. Adapting only a few of these recommendations will result in limited improvement to trail sustainability across the whole of DSRF. Incorporating all of the recommended maintenance and management practices can give DSRF the greatest opportunity to improve trail system sustainability within the Forest.

Management of Emerging Recreational Trends

Throughout the planning process, the subject of electronic mountain bikes (eMTBs) became a topic of discussion during public input sessions, surveys, focus group interviews and stakeholder group interviews. In Section 4—Trails, the plan walks through the trends of eMTBs, classes of eMTBs, state and federal laws regarding eMTBs, eMTBs implications for land managers, other Power-Driven Mobility Devices (OPDMDs), other electronic recreation devices, other emerging trends and provides

recommendations specific to DSRF. It is recommended that no management changes be made within DSRF regarding eMTBs and to keep eMTB use on perimeter roads that are controlled by the North Carolina Department of Transportation. This recommendation is based on both public feedback and the necessary legislative action required to allow eMTBs on state forest lands. To improve communication and compliance regarding Forest regulations on the use of eMTBs it is recommended that DSRF focus on public awareness and education through additional signage, partnership collaboration and outreach and educational programs. If North Carolina law changes in the future to allow eMTBs on forest land it is advisable for the Forest to undergo a review process to assess the compatibility of eMTBs with current Forest uses.

Improvements for Social Media Management

The social media recommendations included in this report focus on Forest objectives of expediting information sharing, content control, real-time updates, community building, brand voice consistency and data insights. Recommendations also include the use of content calendars, visual storytelling, engagement strategies and educational campaigns to enhance the Forest's use of social media and online platforms. This initiative is recommended to include an additional staff position for its development and management. ***See Section 9—Recommendations for a complete list of improvements to in-house social media management and enhancement of the Forest's social media strategies.***

Implementation of Grant Research & Application

Grant allocation can assist in obtaining the funding for trail maintenance, professional trail services and help alleviate the train on State received funds to ensure DSRF's environmental, social and economic sustainability. It is recommended that DSRF obtain a consistent update of the funding landscape, create open and constant communication on priorities and pursuits for future funding and create a checklist to determine the applicability of grants for funding to achieve Forest goals. The Forest should also begin discussions regarding either hiring additional staff specifically for grant research and application or finding additional funds to outsource this process when grants are to be pursued. ***See Section 9—Recommendations for a list of recommended actions for either new DSRF staff or the qualities for third-party grant assistance.***

Benchmarking

It is recommended the Forest implement a benchmarking process to set standards for achievements for basic organizational structure and mark achievements towards environmental, social and economic sustainability. Benchmarking is a helpful tool to recognize achievements towards specific Forest objectives and provide a tool for comparison with similar parks or forests within the nation, state or region. One recommended approach is through the National Parks and Recreation Association (NPRA) which maintains a national benchmarking database for local jurisdictions to compare their standards and practices against those jurisdictions of similar size and population across each state and nation. Being involved with the NPRA would provide DSRF with benefits such as providing research and resources to assist with the support of organizational programs or objectives; access to park metrics through a GIS database tool that provides insight into benchmarking, best practices and planning; access to an online field guide that provides information for suppliers related to the parks and recreation industry; and access to updated information on available grants supported by NRPA. ***See Section 9—Recommendations for additional information about benchmarking opportunities for DSRF.***

CONCLUSION

Through the planning process, it was affirmed that DSRF is a highly loved natural resource with many environmental, social and economic assets that benefit users nationally, regionally and locally. Due to its high popularity, action must be taken in order to preserve and enhance the environmental, social and economic sustainability of the Forest. All of the previously mentioned recommendations should be implemented over the next fifteen years to create the greatest positive impact on environmental, social and economic sustainability of the Forest. ***See Section 6.3 - Prioritization of Needs for more detailed information on the recommended schedule of improvements based on a timeline of short, medium and long term.***

Clockwise from top: DSRF's Junior Forest Ranger Program; Trail Crew Work Day; DSRF's Boundary Line Signage


Ask ME
about the
Junior Forest
Ranger Program


NORTH
CAROLINA
Wildlife
GAME
LANDS
PROPERTY
BOUNDARY
DuPont
State Forest

Existing Conditions

3 Existing Conditions

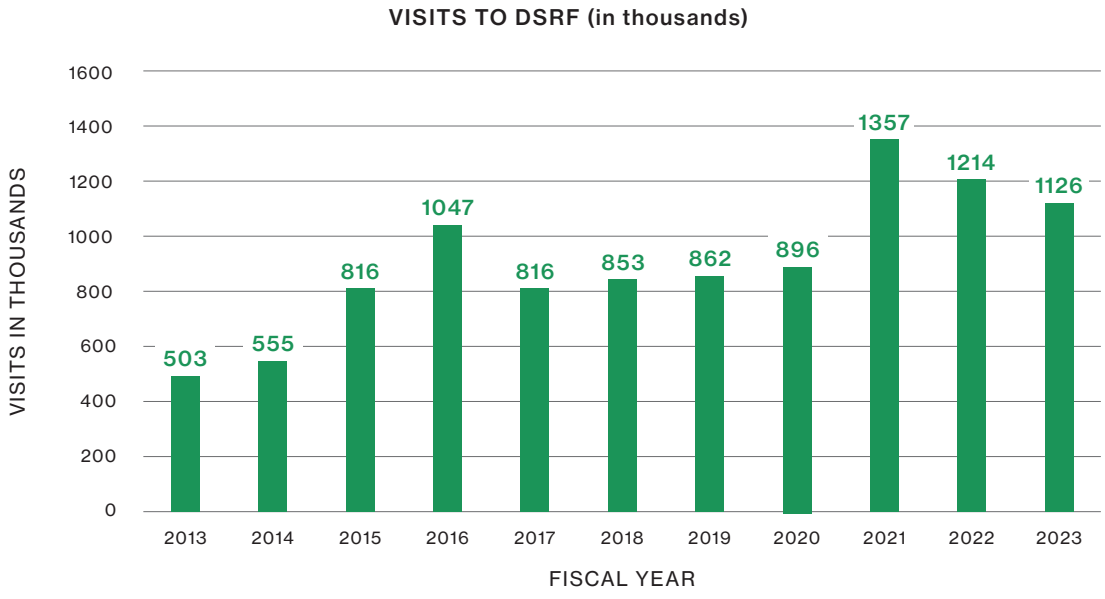
3.1 Demographics

The demographics of a geographic area impact the use of Forest facilities and the need for new or changing facilities in the future. For example, if the surrounding population shows a consistent increase in citizens the Forest plan should include opportunities and management practices to accommodate a potential increase in user rates. The following are trends observed within DuPont State Recreational Forest (DSRF), the United States, Henderson County and Transylvania County.

Increased Visitation

DSRF has become a popular destination for both residents and tourists who want to gain access to the natural environment and participate in various recreational activities. Due to its popularity, the Forest has experienced over a 400% increase in visitation rates between 2013 and 2023. Visitation numbers are recorded for the State fiscal year from July 1st through June 30th. In 2013 the Forest received approximately 503,000 recorded visits while that rate jumped drastically to 1,126,000 in 2023 (see Figure 3-1)[14]. With visitors remaining just under or over 1,000,000 a year, DSRF should continue to expect high visitation levels and probable visitation increases in future years.

Figure 3-1: DuPont State Recreational Forest Recorded Annual Visitation, DSRF Annual Legislative Report for 2023[14]



Increased Interest in Outdoor Recreation

Throughout the United States there has been a large increase in the percentage of people participating in outdoor recreational activities. From 2007 to 2022 there has been a jump from over 49% to over 55% of the U.S. population taking part in outdoor recreational activities (see Figure 3-2)[12]. This 6% increase is equal to about 85 million more people using outdoor spaces for recreational opportunities. DSRF has witnessed this increased interest through the large number of visits recorded in the last ten years. Reviewing data from the last ten years it is projected that DSRF should continue to expect a steady increase in visits from outdoor participants in future years.

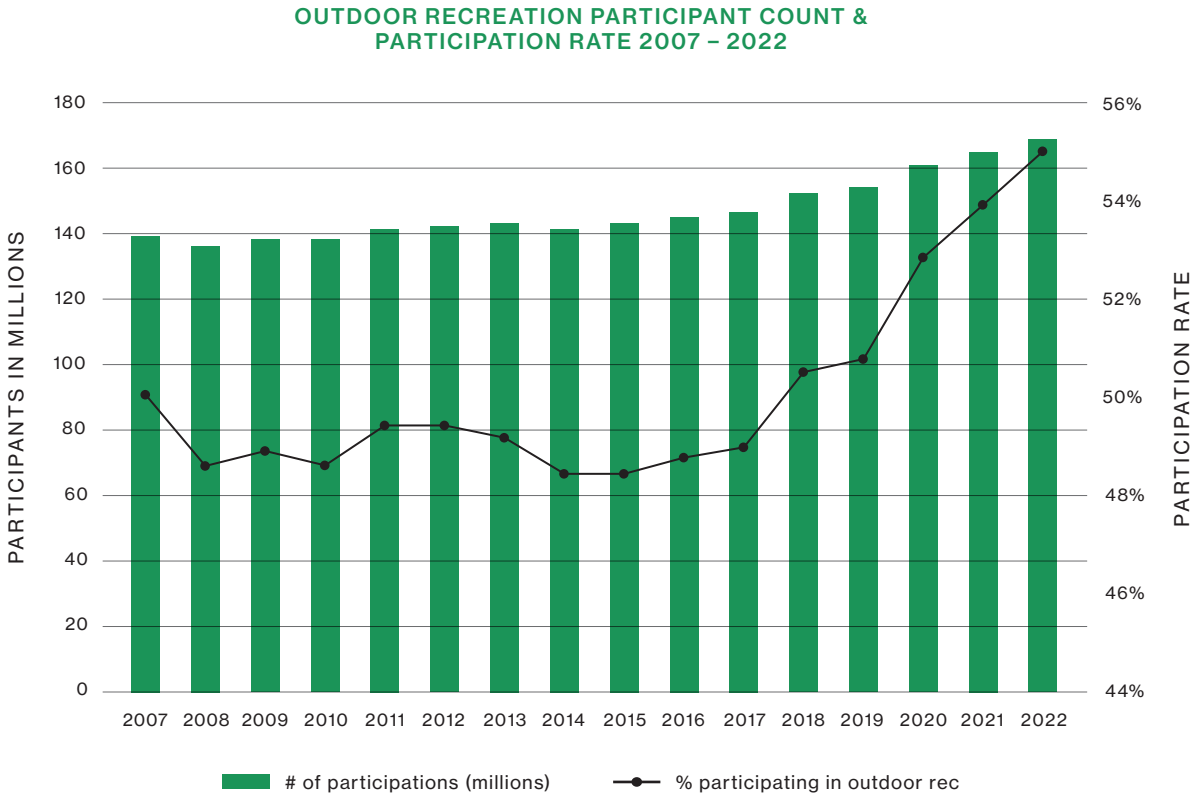


Figure 3-2: United States Outdoor Recreation Participant Annual Count & Participation Rate 2007-2022, Outdoor Industry Association[12]

Within DSRF the majority of the trail miles are classified as multi-use. This means that outdoor participants can use these trails for activities such as horseback riding, hiking, trail running or mountain biking. DSRF is a location where visitors from many different user groups can utilize the Forest for many different activities. In 2022, the United States saw a 22.9% increase in the number of people who participated in the top five most popular outdoor activity categories (see Figure 3-3)[12]. These categories included camping, hiking, fishing and biking. Of these four categories, DSRF offers three of them within the Forest which include hiking, fishing and biking. Being a location that offers access to many trails that allow for these activities is another factor that is resulting in this steady increase in visits to the Forest.

Annual Growth in Large Outdoor Categories Included:

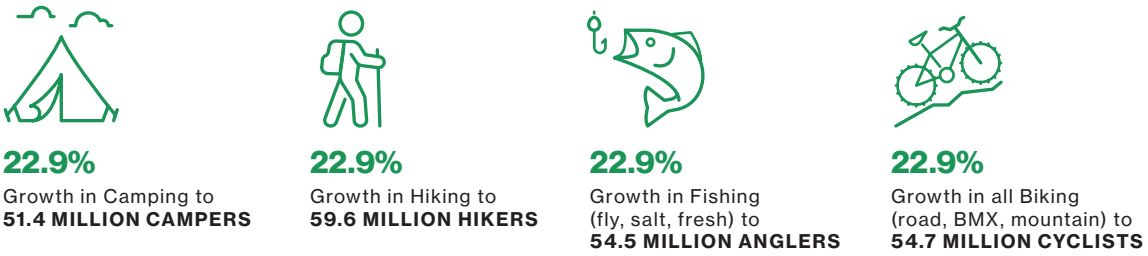


Figure 3-3: United States Annual Growth in Large Outdoor Categories, Outdoor Industry Association[12]

Decreased Outdoor Recreational Outings

While the percentage of users is growing it is important to note that the annual frequency in which users are getting to take part in these activities is showing a slight national decline for the first time since the start of the pandemic. In 2022, there was a 5.1 decrease in the average number of outings recorded annually per participant dropping to 70.5 from 75.6 in 2021 (see Figure 3-4)[12]. It is also important to note that during this information-gathering process, it was observed that younger generations such as Gen Z (1997-2012) and Gen Alpha (2013-present) had a slight decrease in outdoor recreation participation while older generations such as Baby Boomers (1946-1964) and Gen X (1965-1980) had an increase in participation. This could be an indication for DSRF to begin to provide additional information or opportunities for older generations with varying levels of accessibility. In addition, DSRF should acknowledge that the high level of visitation may continue to contain more and more visitors who are new to outdoor recreation activities making educational and safety signage an important factor to facilitate a safe and respectful experience within the Forest.

Average # Outings per Participant 2013 – 2022

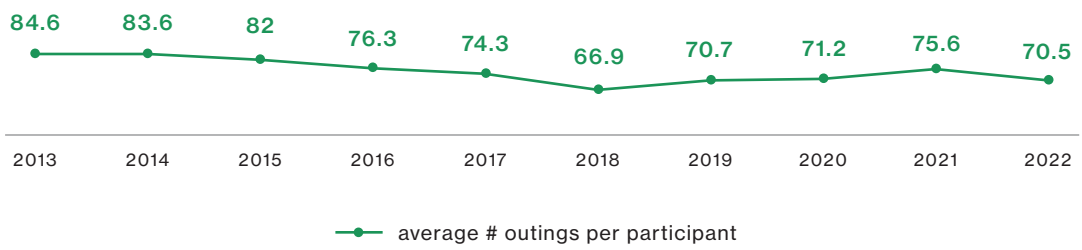


Figure 3-4: United States Average Annual Outings per Participant 2013-2022, Outdoor Industry Association[12]

Great Smoky Mountains National Park, Blue Ridge Parkway—nps.gov

Increased Population & Median Income of Surrounding Communities

Henderson County is located within the Blue Ridge Mountain Range of the Southern Appalachian Mountains. The county encompasses an area with rugged terrain, including the Pisgah Mountains, Blue Ridge Escarpment and the Green and Hungry Rivers. The population is dispersed across the county, with approximately 34.3% of the population residing in low population density areas[13]. Between 2021 and 2022 the population grew by almost 1,000 residents which resulted in a 0.74% increase. Within this time the median household income grew from $59,928 to $65,508, which showed a 9.31% increase. The geography of the county, including its rivers and streams has historically influenced settlement patterns, agricultural practices and the types of resources available for sustenance and shelter.

Transylvania County is also located in the Blue Ridge Mountains and is known for its rugged terrain, including waterways such as the French Broad River. The population is dispersed across the county, with 60.4% of the population residing in low-population-density areas[13]. Between 2021 and 2022 the county population grew by almost 200 residents, which resulted in a 0.46% increase. Within this time median household income grew from $57,830 to $62,056, which showed a 7.31% increase. State-protected areas within Transylvania County include DSRF, Headwaters State Forest and Gorges State Park. The outdoor recreation industry has had an impact on Transylvania County, with the area being home to conservation efforts that have helped to protect approximately 14,500 acres with almost 50% of county land being publicly owned and protected. This industry creates opportunities for outdoor recreation and tourism, especially with the presence of state-protected areas.

With a steady increase in population size and the median household income of surrounding communities, DSRF should expect to see a steady increase in residents visiting the Forest.

3.2 Regional Context

DSRF is a cherished natural treasure located in western North Carolina along the boundary of Henderson and Transylvania Counties between the towns of Hendersonville and Brevard. A small portion of the Forest runs along the South Carolina state line with the Little River running through the Forest. The DSRF is made up of 12,489 acres of forest land with over half of that land designated as a dedicated nature preserve[6]. The Forest contains many natural resources, which include but are not limited to 71 miles of protected streams, 6 natural waterfalls, 5 lakes and 22 rare natural communities. The Forest provides many ecological benefits as well such as the absorption of 30,000 tons of carbon dioxide each year. The Forest also offers 81 miles of multi-use trails and roads that are open to the public and provide opportunities for scenic enjoyment and recreational activities. Visitors can access these trails and natural resources 7 days a week on a year-round basis.

The surrounding region includes many natural assets that provide many opportunities for outdoor recreation, environmental conservation, scenic views and interactions with the natural environment. Due to this concentration of preserved areas, many visitors and residents are attracted to these areas so that they may experience outdoor recreational activities such as hiking, horseback riding, hunting, fishing and mountain biking. Figure 3-5 is a map indicating the location of those significant assets maintained by non-profits and federal, state and local governments. Of those assets, including Ceasars Head State Park and Pisgah View State Park, many other locations provide outdoor recreation and exposure to scenic vistas, wildlife and the natural environment. These assets include several national forests and parks, state forests and parks and regional trail systems.

Chickamauga and Chattanooga National Military Park—nps.gov

3.2.1 REGIONAL CONTEXT MAP

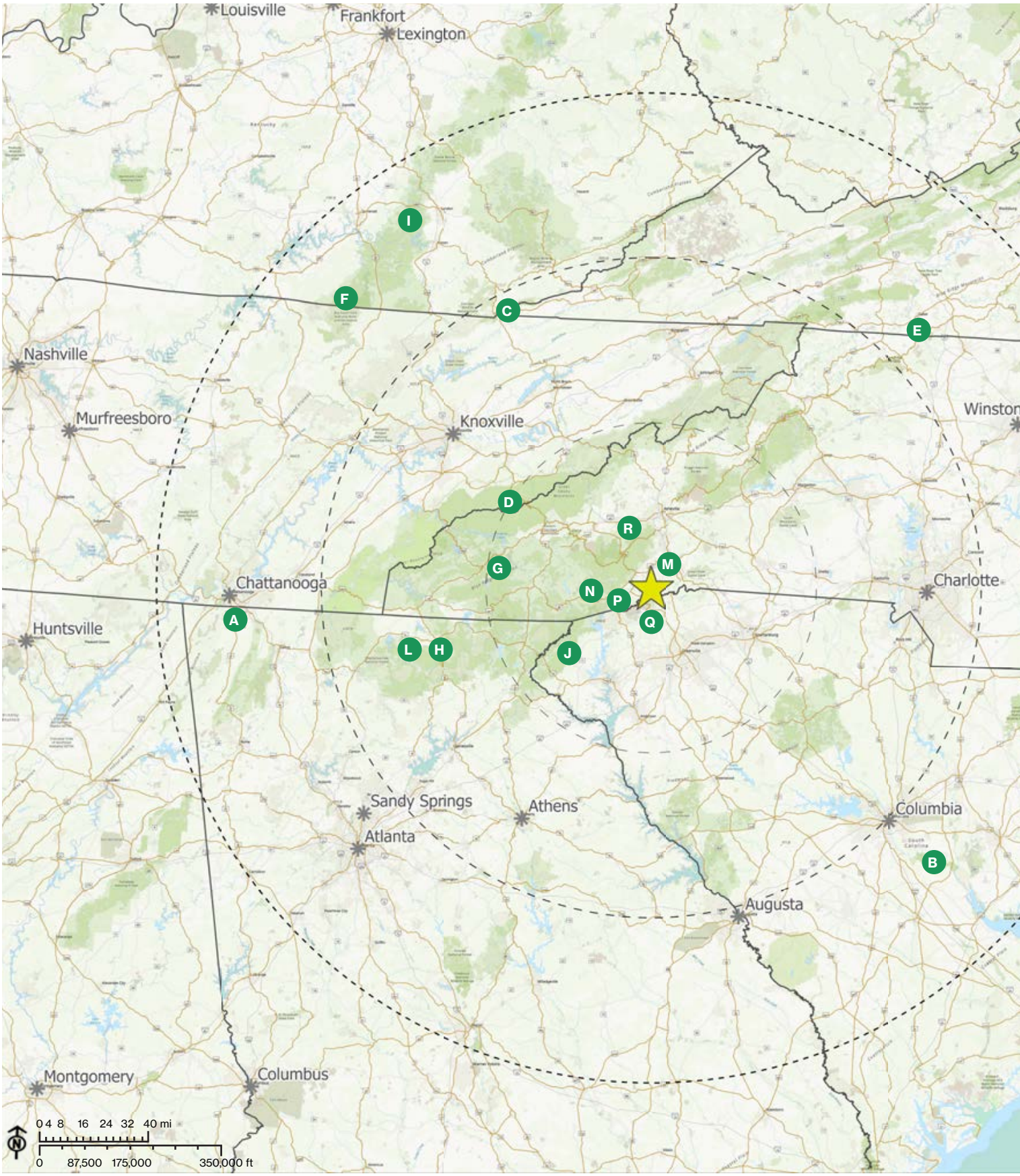
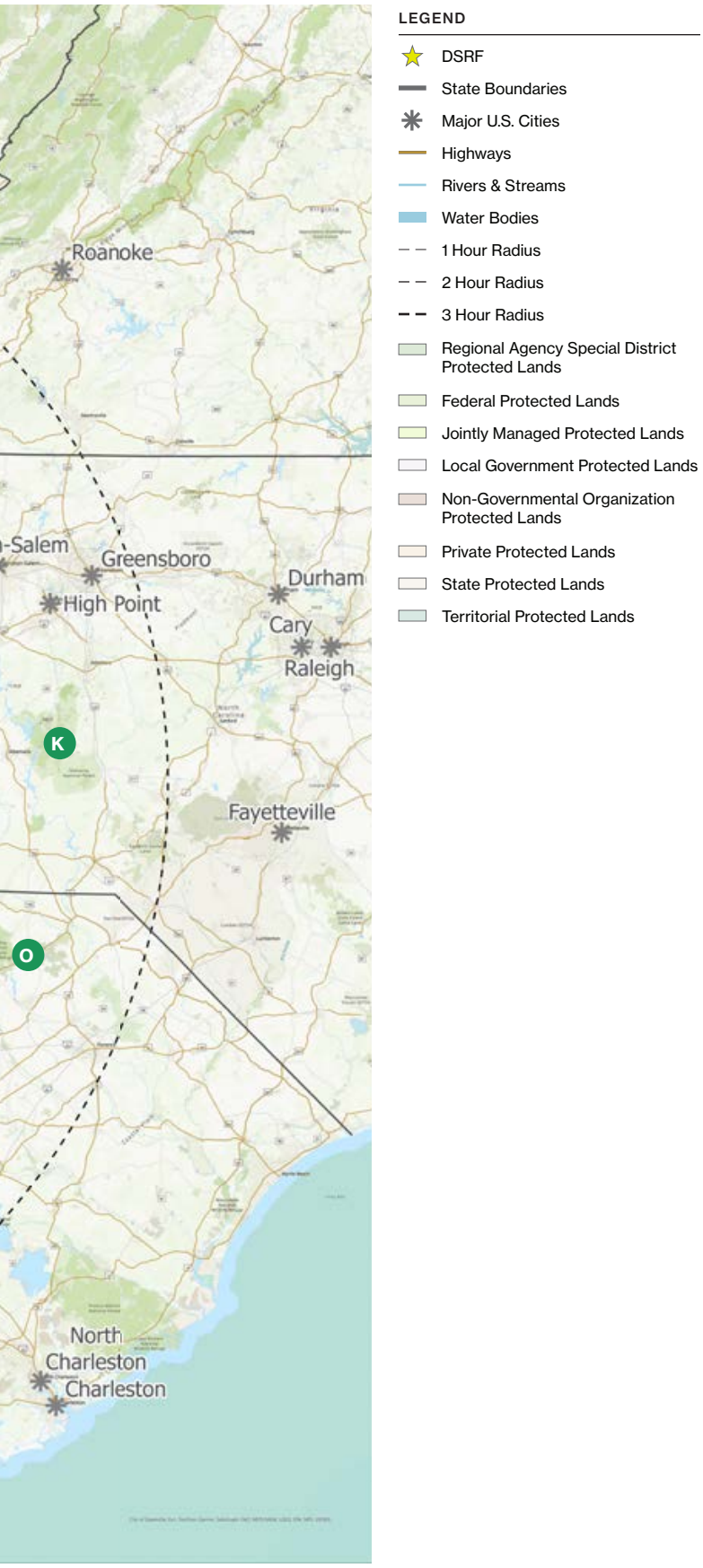


Figure 3-5: DuPont State Recreational Forest Regional Context Map



3.2.2 NATIONAL PARKS, RECREATIONAL AREAS, FORESTS & WILDLIFE REFUGES

National parks, recreational areas, forests and wildlife refuges in the region offer a diverse range of natural amenities and recreational opportunities for visitors. Such outdoor activities can include whitewater rafting, birdwatching, fishing, hiking, camping and scenic drives. Each of these natural areas has its own unique features and attractions making them popular destinations and regional assets for outdoor enthusiasts and nature lovers (see Figure 3-5). The national natural assets found within the region include:

A. Chickamauga & Chattanooga National Military Park
B. Congaree National Park
C. Cumberland Gap National Park
D. Great Smoky Mountains National Park
E. Blue Ridge Parkway
F. Big South Fork National River & Recreation Area
G. Nantahala & Pisgah National Forest
H. Chattahoochee National Forest
I. Daniel Boone National Forest
J. Sumter National Forest
K. Uwharrie National Forest
L. Oconee National Forest & Wildlife Refuge

3.2.3 STATE FORESTS & PARKS

Due to the proximity to the state line, DSRF is located within a few hours drive from various state forests and state parks located within North and South Carolina (see Figure 3-5). The South Carolina Forestry Commission has a similar mission statement to that of the North Carolina Forest Service in that they both focus on the promotion, protection and enhancement of forests for the benefit of all[15]. Some of the South Carolina State and North Carolina Forest and Parks include:

M. Holmes Educational State Forest
N. Gorges State Park
O. Sand Hills State Forest
P. Headwaters State Forest
Q. Ceasars Head State Park
R. Pisgah View State Park

3.2.4 REGIONAL TRAIL SYSTEMS

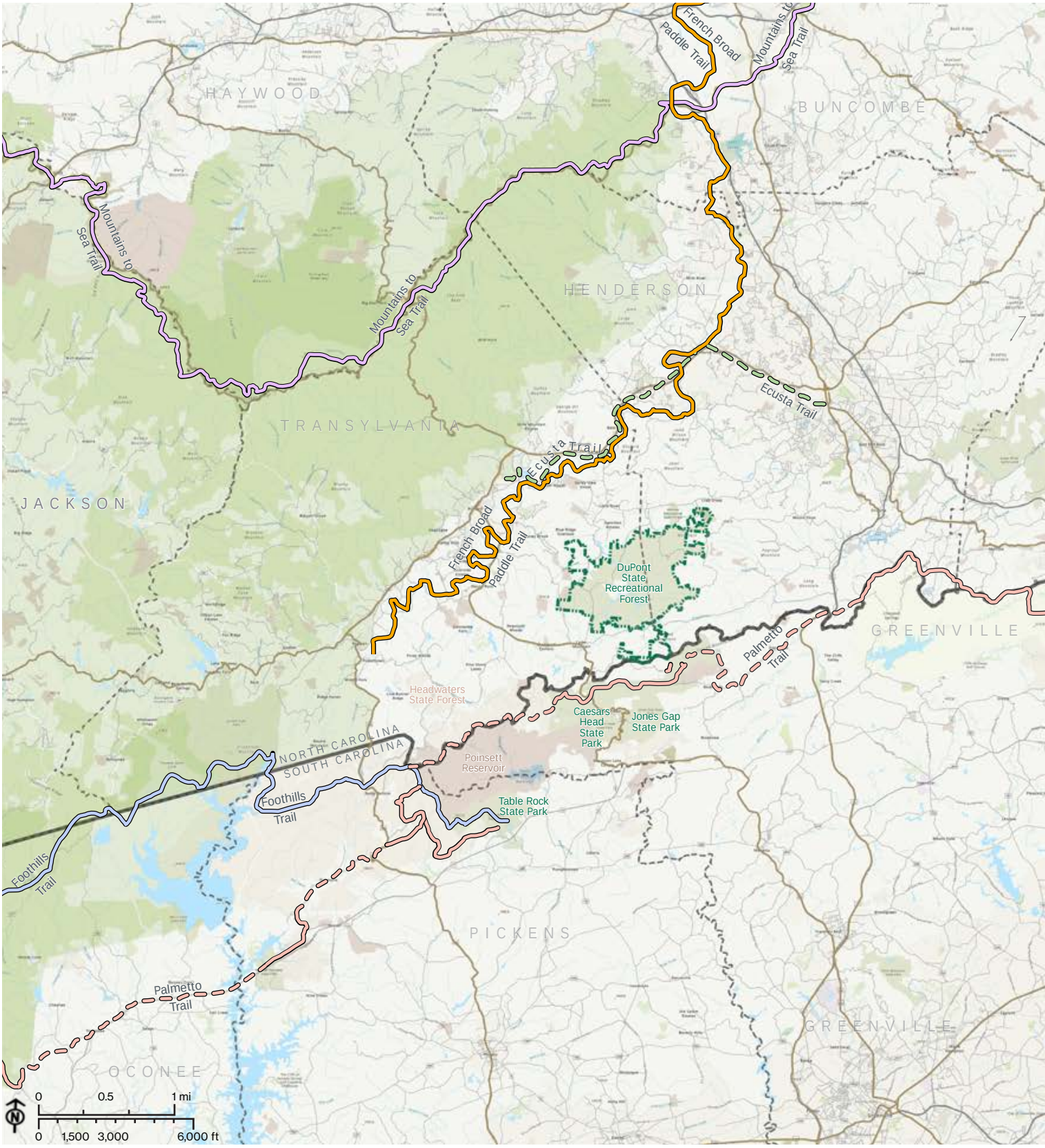
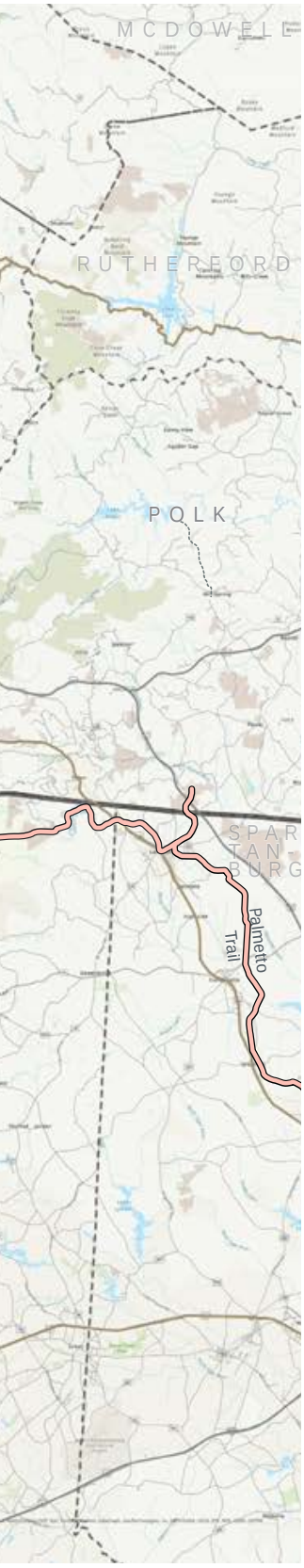


Figure 3-6: Regional Trail Systems in Proximity to DSRF



LEGEND

- DSRF Boundary
- County Boundaries
- State Boundaries
- Limited Access
- Highways
- State Roads
- Rivers & Streams
- Water Bodies
- Foothills Regional Trail – Completed
- French Broad River Paddle Trail
- Mountains-to-Sea Regional Trail – Completed
- Palmetto Regional Trail – Completed
- Palmetto Regional Trail – Conceptual
- Ecusta Regional Trail – Conceptual
- Regional Agency Special District Protected Lands
- Federal Protected Lands
- Jointly Managed Protected Lands
- Local Government Protected Lands
- Non-Governmental Organization Protected Lands
- Private Protected Lands
- State Protected Lands
- Territorial Protected Lands

Regional Trail Systems are found throughout the United States and offer users a unique opportunity to travel along a trail that can cross park, forest and state boundaries. The length of the trail provides the user with the ability to experience different ecologies, wildlife and several states, forests or parks. The trail experiences vary and can range from a water paddle trail to a primarily hiking only trail. Regional trail systems are assets to the surrounding community as they attract visitors as well as provide connectivity to various locations within the region. Below are five regional trails found in the DSRF region (see Figure 3-6).

Ecusta Rails-to-Trails

When completed this multi-use greenway will run 19.4 miles along an unused railway corridor[16]. The trail will connect Brevard to Hendersonville. Users will be able to bike, run, walk and have ADA accessibility trail opportunities. The trail will allow users to experience pastures, streams, fields and forests within the area. The Ecusta Trail aims to connect communities while enriching quality of life, economic growth and connecting communities.

Palmetto Trail

Established in 1994, this trail will run from Walhalla, SC in the Blue Ridge Mountains to Awendaw, SC located on the Intracoastal Waterway[17]. When the trail is completed, it will consist of 500 miles of trail open to hikers and bicyclists. The trail will connect assets such as national forests, wildlife management areas, Native American paths, swamps, mountains and state and county parks.

Foothills Regional Trail

This regional trail Is 80 miles in length and runs from the Oconee State Park to Table Rock State Park in South Carolina[18]. It is known as a difficult trail that is primarily hiking only with few access points for vehicular use. The majority of the trail is within the backcountry and takes a user through a national forest, a wild and scenic river area, a wilderness area, a state forest and a state park.

French Broad River Paddle Trail

This regional paddle trail ranging 140 miles is designed for recreational watercraft[19]. The trail runs from Rosman, North Carolina to Newport, Tennessee. It is managed by individual volunteers, regional non-profit organizations, government agencies and local businesses.

Mountains to Sea Regional Trail

This regional trail is a footpath spanning across North Carolina from Clingmans Dome in the Great Smoky Mountains National Park to Jockey's Ridge in the Outer Banks[20]. The trail highlights much of the ecological diversity found in the state including coastal swamps, Piedmont farms, barrier islands and mountains. The trail currently consists of 725 miles of built trail. Each year many volunteers construct additional portions of the trail.

3.3 The DSRF Waterfall Corridor

DSRF is well known for its natural and beautiful waterfalls. Within DSRF there are six waterfalls located throughout the property. Five of these waterfalls are located within what is known as the very popular waterfall corridor (see Figure 3-7). These waterfalls include:

Bridal Veil Falls

One of the most unique falls within DSRF is Bridal Veil Falls. It is the first fall along the Little River that runs through the Forest[10]. At the first tier of the falls, the water flows over an overhanging ledge. As the water moves further through the falls it can then be seen running down a shallow long incline of granite before it reaches the pool below. The falls can be accessed by starting at either the High Falls, Fawn Lake or Corn Mills Shoals access areas.

Bridal Veil Falls

Grassy Creek Falls

Grassy Creek Falls demonstrates another shallow flow of water over the rock before reaching a small pool below[10]. The falls can be accessed by starting at either the High Falls, Guion Farm or Lake Imaging access areas. If a user is looking for the shortest hiking option, it is recommended to start at the High Falls parking area and hike 1.3 miles to the falls.

High Falls

High Falls is the largest waterfall within the DSRF[10]. Water falls down the plane of granite 120 feet to create a spectacular waterfall experience before reaching the pool below. The falls can be viewed from the available overlook or you can continue down the 0.5-mile trail from the Visitor Center to reach the base of the falls. The falls can be accessed from either the High Falls or Hooker Falls access areas.

High Falls

Hooker Falls

Hooker Falls stands just 12 feet high and has a large width it creates an ideal spot for users to gather and enjoy the cool water on hot summer days[10]. The easiest waterfall to access is located a third of a mile from the Hooker Falls access area. The falls can also be accessed from the High Falls access area.

Hooker Falls

Triple Falls

Triple Falls is a series of three falls that can be easily accessed by hiking along the portion of the High Falls Loop trail that follows along the Little River[10]. You can view the falls from the available overlook, or you can continue down the stairs for a closer look at the base of one of the fall sections. There is unique habitat in this area, so visitors need to stay within the designated areas. Near the falls there is a shelter that provides a great opportunity for enjoying a picnic or taking a break while viewing the falls. The falls can be accessed from either the Hooker Falls or High Falls access areas.

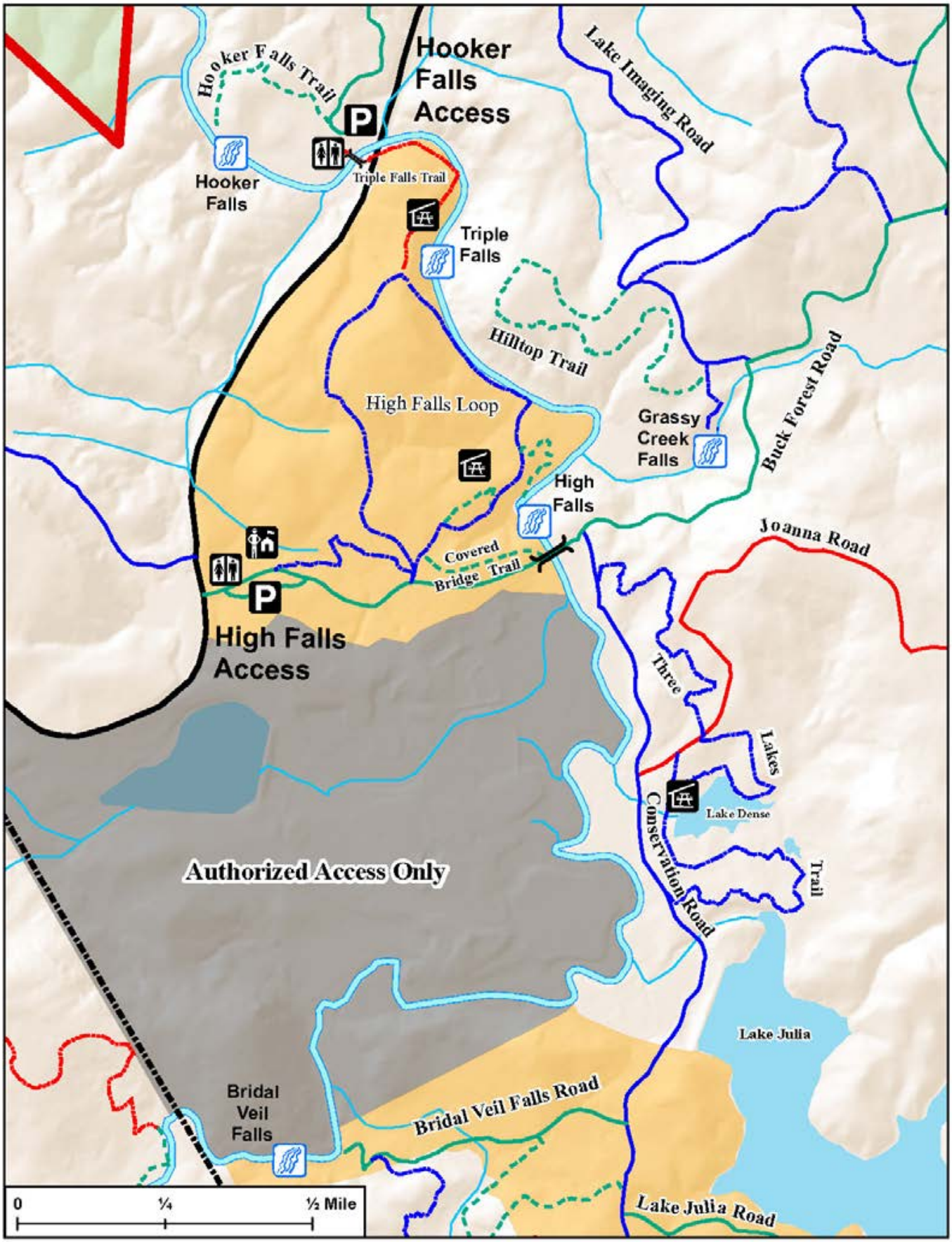
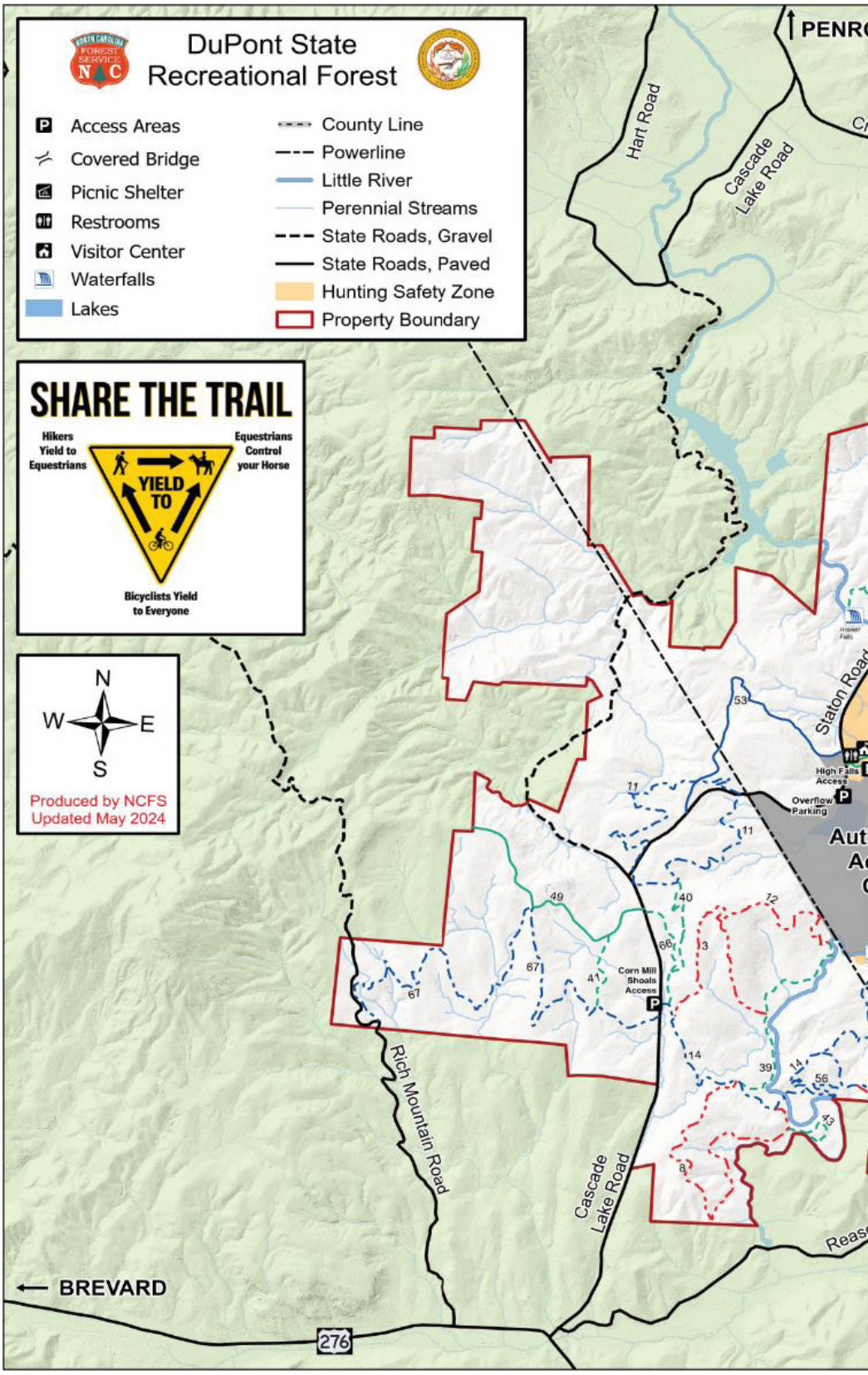


Figure 3-7: DuPont State Recreational Forest Waterfall Corridor Map[9]

3.4 Existing Trail Network

DSRF's trail network consists of 58 miles of multi-use trails and over 23 miles of interior Forest roads[6]. These trails are spread throughout the Forest and vary in trail material, level of difficulty and offered points of interest. Currently, there are 74 trails and roads available for public use (see Figure 3-8). Roughly 98% of these trails and roads are bi-directional and are often used by user groups such as hikers, horseback riders and mountain bikers. With high levels of use and trails being used by a variety of users, the existing conditions of the trails vary and those that receive higher levels of user require the most maintenance.

For more detailed current trail conditions see Section 4—Trails.



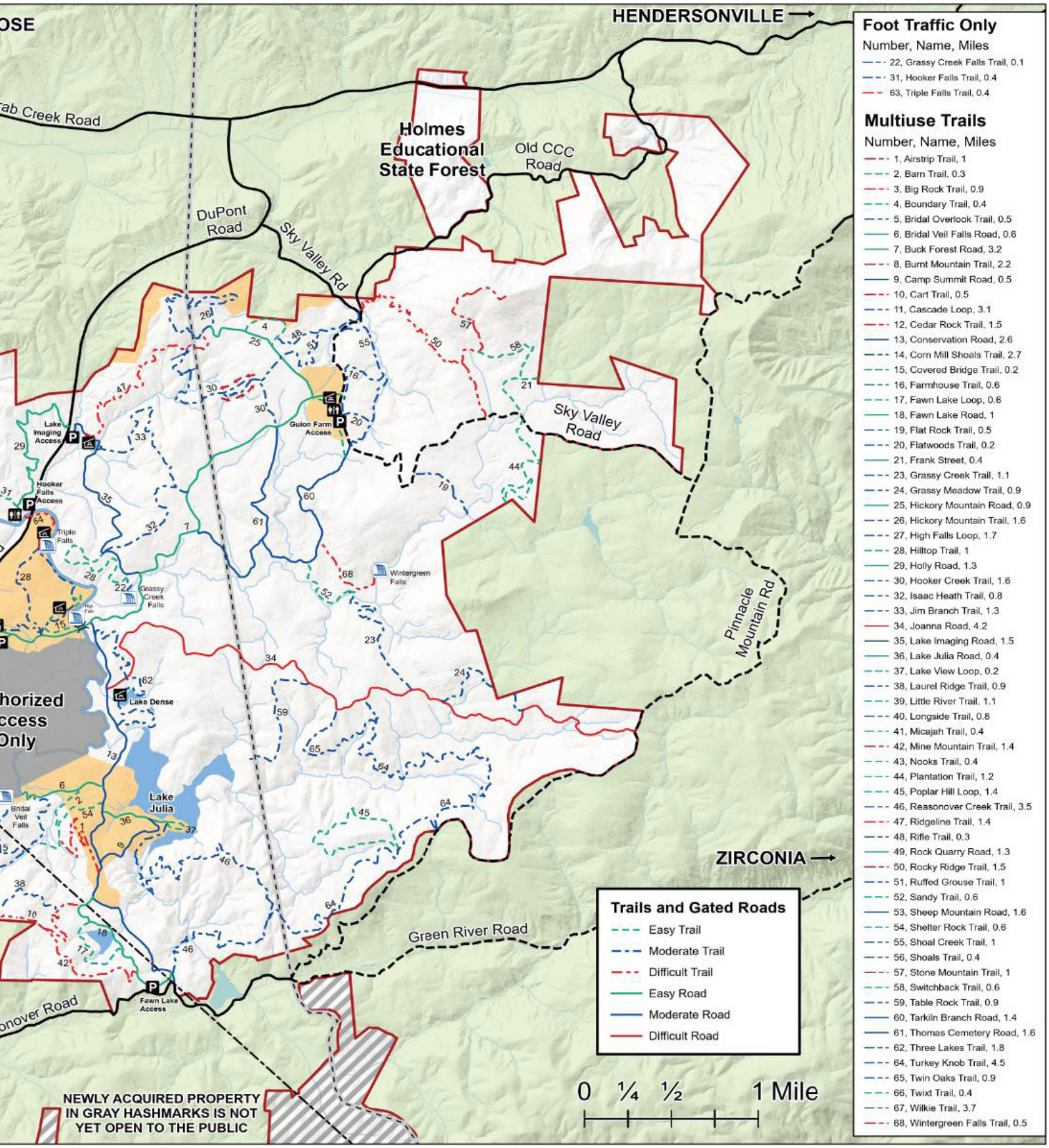


Figure 3-8: 2024 DuPont State Recreational Forest Trail and Road Map—dupontstaterecreationalforest.com

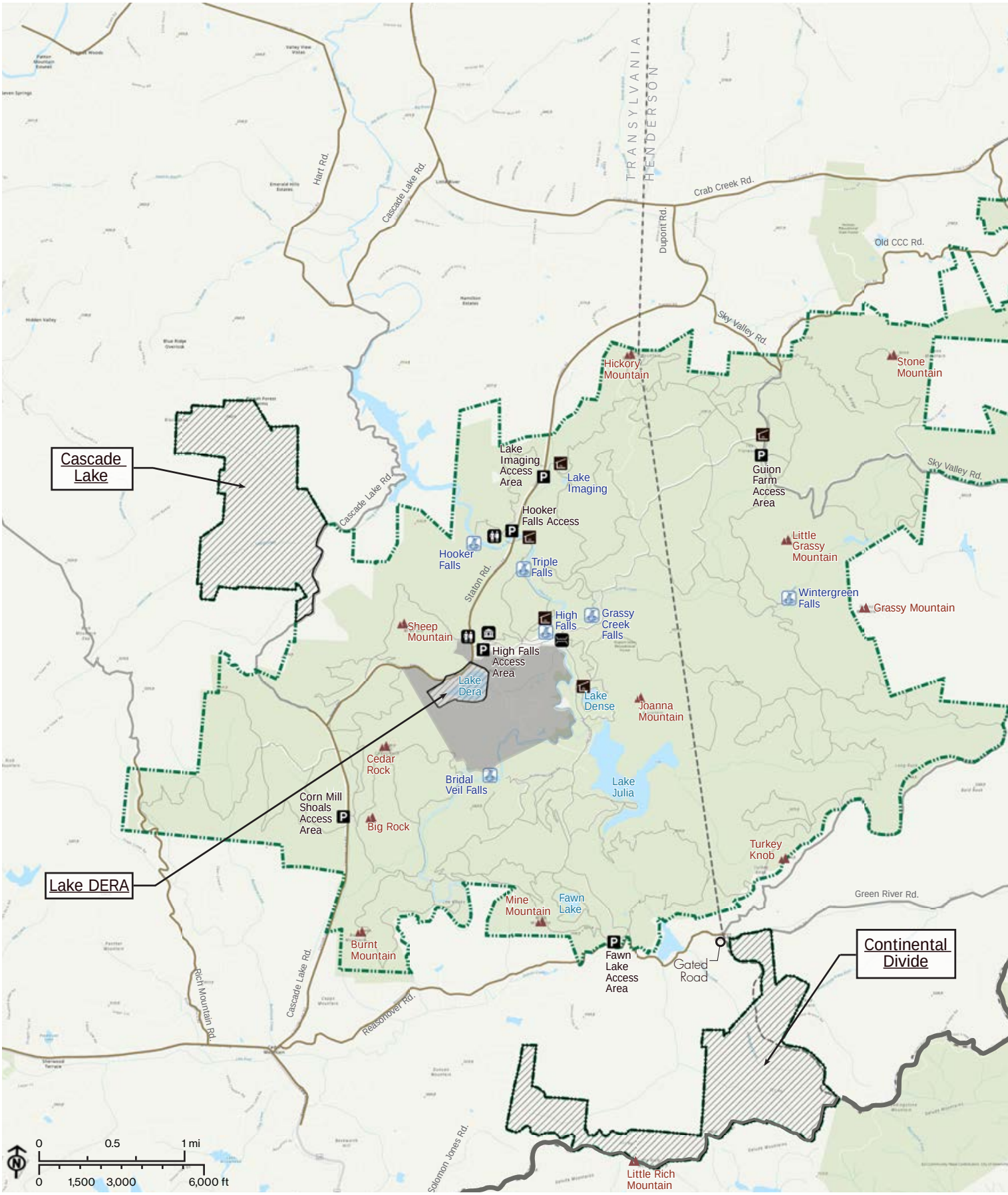


Figure 3-9: DuPont State Recreational Forest New Property Map

LEGEND

- DSRF Boundary
- County Boundaries
- State Boundaries
- Access Areas
- Picnic Shelters
- Restrooms
- Visitor Center
- Waterfalls
- Covered Bridge
- Peaks
- State Roads, Paved
- State Roads, Gravel
- Little River
- Streams
- Water Bodies
- Authorized Access Only
- Trails & Gated Roads
- New Properties

3.5 New Properties

Cascade Lake

In 2016, the Estate of Charles Pickelsimer, Jr. donated 778.5 acres of land to the DSRF[21]. The property is located on the Transylvania County portion of the Forest and can be accessed by traveling along Cascade Lake Road. The majority of the land is heavily forested and undeveloped. This additional land will allow for the Forest to provide future less-developed recreational opportunities, such as hunting, fishing and scenic enjoyment.

Continental Divide

On July 1, 2020, DSRF gained 717 acres of land from Conserving Carolina[22]. The property, which is located south of the main land mass of DSRF, is considered a link between the Forest and the conservation corridor which consists of 100,000 acres of protected lands that extend along the South Carolina and North Carolina state line. The land was acquired in two phases with the first portion of land being purchased in 2019. The new addition includes areas of unique wildlife habitat, streams containing trout and rare wildflowers. The land addition will allow for the Forest to preserve additional important wildlife corridors, recreation opportunities and protect water qualities for streams and rivers such as Reasonover Creek and the Green River.

Lake DERA – the Former DuPont Manufacturing Facility

The land around Lake DERA has been classified as a restricted area with no public access since the manufacturing plant's demolition in 2006[23]. This area was evaluated for public recreation potential as part of the Master Recreation Plan, the findings of which can be found in ***Section 7.2—Lake DERA (Donut Hole)***.

3.6 Administrative, Budgeting & Management

Administration

DSRF is managed by the North Carolina Forest Service (NCFS). The NCFS is a division of the North Carolina Department of Agriculture and Consumer Services and is directed and mandated by Title 2 and chapters 77, 106 and 143 of the North Carolina General Statutes[1]. The forest land under NCFS management is considered a great economic value to the state and adds unlimited opportunities for the quality of life for residents. NCFS directly employs about 790 people, however, the Forest Service supports employment of about 148,000 residents in forest-related industries and accounting for $34.9 billion to the State's economy annually. The primary purpose of the NCFS is to ensure the quality of forest resources for the state and ensure that appropriate resources are provided to meet present and future needs. The NCFS is organized into several categories which include the Assistant Commissioner's Office, five sections, three regional offices, thirteen districts and the county offices in all 100 counties. See below for additional information on these groups within the organization[1].

- Assistant Commissioner's Office: located in Raleigh, NC, which includes the State Forester
- Five Sections: Aviation; Safety, Planning & Analysis; Forest Protection; Forest Management and Development; & Administrative Services
- Three Regional Offices: Piedmont (located at Jordan Lake), Mountain (located in Asheville) and Coastal (located in Kinston)
- Thirteen Districts with headquarters in Asheville, Elizabeth City, Fairfield, Fayetteville, Hillsborough, Lenoir, Lexington, Mount Holly, New Bern, Rockingham, Rocky Mount, Sylva and Whiteville
- County Forest Ranger in each county and is responsible for following through with all agency programs within their county[1].

Budgeting

Funding and expenditures related to DSRF are calculated annually for the fiscal year of July 1st through June 30th and disclosed in the Annual Legislative Report on DuPont State Recreational Forest[24]. The Forest's annual operating and maintenance (O & M) expenditures are derived from the State's budget appropriation to the NCFS. Simply stated, capital improvements are expenditures that are non-routine costs for items such as repair and renovation of existing capital assets, development of new capital assets or the acquisition of property by the State. DSRF budgets funds for upcoming capital improvements by identifying areas in need and prioritizing capital improvements that will better address concerns for all of the Forest's mission elements, including items such as safety and high visitor levels. DSRF updates its plans for capital improvements for upcoming budget years to anticipate non-routine costs and wisely plan for capital improvement costs for DSRF. The capital improvement expenses are derived from the North Carolina Parks and Recreation Trust Fund (PARTF). The expenditures from the last three years are as follows and are capital improvement items and O & M expenditures:

DSRF's O & M expenditures have increased by almost 200% and overall capital improvement spending has increased by over 400% over the last three years[24].

The DSRF collects fees and revenues for timber, commercial use permits, filming activities, etc. These sources of revenue amounted to an average over the last three report years of $65,119 per year[24]. In the fiscal year 2022 Annual Legislative Report on DSRF the total reimbursement revenue was $100,794 for the year, which showed an increase of 335% compared to the revenue received in 2021.

DSRF Capital Expenditures

FISCAL YEAR (JULY 1- JUNE 30)	2022	2023	2024
PARTF Expenditures *(non-trail projects)*	$505,875	$482,456	$334,371
PARTF Trail Projects		$169,219	$117,943
Other Capital Investments for Recreation			$200,000
Other Capital Investments *(non-PARTF/non-Recreation)*	$27,977	$883,888	$189,188
	$200,951	**$1,056,862**	**$841,502**

DSRF Operations & Maintenance Expenditures

FISCAL YEAR (JULY 1- JUNE 30)	2022	2023	2024
Total Non-Salary Costs	$283,018	$417,898	$524,667
Recreation Operational Costs	$3,000	$26,167	$32,219
Signage	$2,032	$3,543	$6,699
	$288,050	**$447,608**	**$563,585**

Management

The Forest is operated by four temporary employees and 19 full-time employees[24]. The positions include Forest Supervisor, Assistant Forest Supervisor, Office Manager, Administrative Associate, Management Forester, Forestry Technician, Recreation Specialist, Recreation Technician, Firefighting Equipment Operator, Facility Maintenance Supervisor, Mechanic, Maintenance Technician, Maintenance Technician (temporary), Housekeepers (temporary), Communications Director, Visitor Center Assistant (temporary), Information and Education Supervisor, Education and Outreach Coordinator, Educational Ranger, Lead Law Enforcement Agent and two Law Enforcement Agents. Each employee adds a vital service to the operations and management of DSRF to ensure that Forest objectives are being pursued and users are having positive experiences within the Forest.

Trails

4 Trails

4.1 Introduction

DuPont State Recreational Forest (DSRF) trail network consists of almost 58 miles of multi-use trails and over 23 miles of multi-use roads. The trails are located throughout the Forest and offer a range of levels of difficulty and points of interest. With 98% of the trails designated as multi-use, most user groups can use most of the trails offered within the Forest. Currently, there are 74 trails within the Forest. Due to how they are laid out many have intersecting points that provide opportunities for users to create their own loop system allowing for shorter or longer experiences when in the Forest.

With 1,214,000 visits recorded in 2022, DSRF is experiencing a high level of use on many of its trails and roads. Due to this, it is important to perform trail, road, creek crossing and road crossing assessments to determine the current state of the network and identify strategies that could improve the overall sustainability of the trail network. With the Forest experiencing such heavy use, DSRF currently must allocate limited resources to areas of high use to ensure a safe and positive user experience which results in some trails not receiving the maintenance they require. This plan will detail all maintenance requirements and provide cohesive recommendations that focus on both the physical trail network maintenance as well as new management strategies that will assist in the sustainability of the trail network as a whole. *For this section, the trail numbering system is tied to the DSRF Existing and Conceptual Trail Map (Figure 7-1) provided in Section 7—Concept Plans.*

4.2 Trail Network Needs Assessment

The trail system in DSRF is largely cohesive with a series of cluster zones, the trails originating from access areas, receiving most of the traffic. The trails between the access areas, those that exist outside of the cluster trail zone see less traffic. There is a third zone of trails even further away from the parking areas that see even less user traffic and sometimes hardly any user traffic at all. These areas were roughly divided up into the primary, secondary and tertiary trails a user must navigate to get further into the system. Cluster zones were broken into the following areas:

Corn Mill Shoals Cluster

There are no trails in the Corn Mill Shoals Cluster that don't need some level of work. This ranges from brushing to tread work and drain establishment. Big Rock and Burnt Mountain are two in the cluster that will need much heavier work to keep them sustainable. This work would include lots of rock armor and gargoyles to provide a narrow and sustainable trail tread.

Fawn Lake Cluster

Most of the trails in this cluster need moderate maintenance and brushing. Cart Trail is an unsustainable connector that needs to be eliminated. Reasonover Creek trail needs heavier maintenance, with a short reroute to correct the steep switchback turn section above the creek.

Guion Farm Cluster

The bulk of the trails in this cluster need only moderate maintenance and brushing. Heavy maintenance is ongoing on Wintergreen Falls Trail and Sandy Trail is being closed for an unsustainable alignment and placement. Grassy Creek Trail is receiving moderate maintenance brushing and some rock armoring.

Lake Imaging Cluster

Most of the trails in this cluster only need light to moderate maintenance as this area received heavy maintenance in 2022.

High Falls Cluster

These two parking areas are completely different from the other parking areas within DSRF. The user expectations seem to be more about a more formal Forest experience. As such these clusters need a more formal landscape planning, sustainable infrastructure, hardening areas, design and analysis than a natural surface trail builder can provide.

4.2.1 REVIEW GUIDELINES & CLASSIFICATIONS

The trails were reviewed and assessed to kick off the project. Trails were assessed on the ground in the spring of 2023 focusing on the following parameters:

PARAMETER	DETAIL
Apparent Use Type & Amount	Asses the type of users and the apparent amount of each user on the trail. Look at visual trail impacts and trail users
Difficulty Level or Dominant-Use Difficulty Level	Listed and perceived difficulty of each trail
Maintenance Needs	Immediate maintenance needs
Experience Reported &/or Assessed	Type of trail experience for the users
Redevelopment Potential	Potential for redevelopment, alignment changes, re-routes or experiential changes
Physical & Social Conditions	Potential for positive or negative trail interactions based on the physical attributes of the trail
Surface Type	Prevailing surface material; natural or imported
Condition of Tread *graded as an average A, B, C, D, F*	Assessment of tread condition; cupping, ruts, erosion, loose, compacted, etc.
General Condition of Drainage Structures *graded as an average A, B, C, D, F*	Assessment of any drainage structures or issues along the trail. Looking at grade reversals, grade dips, knicks, rolling grade dips, head-cutting erosion, etc.
Washed-out Sections of Trail *if notable*	Note any washed-out sections of trail requiring immediate attention
Signage Assessment *Quantity & Placement*	Assessment of signage for navigation and responsiveness
Condition of Wet Crossing *graded as an average A, B, C, D, F*	Assessment of type and condition of any water crossings
Intersections *Social & Ecological Assessment*	Potential for positive or negative trail interactions based on the physical attributes of the trail intersections
Volunteer Total Maintenance Hours; Date Range; Primary & Secondary Focus	Data provided by DSRF staff records.
Forest Staff Mechanized Assistance	Data provided by DSRF staff records.

4.2.2 TRAIL NEEDS ASSESSMENT

The team assessed all of the trails in the Forest and selected twenty-six (26) to be further assessed for critical needs due to their continual low sustainability regardless of their history of maintenance frequency (see table below). These trails were also chosen because they provided the greatest opportunities for improved trail sustainability and a more cohesive trail system throughout DSRF. ***Please refer to the Existing and Conceptual Trail Map in Section 7.1—Trail Network*** for trail reference. It is important to note that an additional DSRF staff will need to be hired to address the trail maintenance, closures, new conceptual trails and management strategies. Without this new staff the responsibilities would be too great for the current staffing levels. ***See Section 9—Recommendations for the additional staffing needs at DSRF.***

It is also important to remember that trails are not static. They will always need some level of maintenance. Proper design and alignment should provide some future budgetary relief, however, trails that need heavy work or realignment will become more expensive to remedy over time.

Each trail was assessed and given two letter grades based on conditions for the tread and drainage structures. This assessment was limited to singletrack trails only. Old roads being used as recreational routes in the system were assessed separately on a more detailed level. The amount of maintenance being put into each trail was also a factor for ranking the trails:

NEED RANKING	MAINTENANCE LEVEL	SUSTAINABILITY	TOTAL
High	**High maintenance frequency performed**	**continued low**	**9 trails***
High	**Low maintenance frequency performed**	**low**	**17 trails***
Low	High maintenance frequency performed	subsequent high	12 trails
Low	Low maintenance frequency performed	high	15 trails

* Itemized list of high need trails categorized by cluster found below

	TRAIL	RECOMMENDATION
Corn Mill Shoals (CMS) Cluster	**3 Big Rock Trail**	remain open
	8 Burnt Mountain Trail	remain open
	11 Cascade Loop	remain open
	12 Cedar Rock Trail	remain open
	14 Corn Mill Shoals Trail	remain open
	39 Little River Trail	remain open
High Falls Cluster	**15 Covered Bridge Trail**	remain open
	27 High Falls Loop	remain open
	31 Hooker Falls Trail	remain open
	63 Triple Falls Trail	remain open

	TRAIL	RECOMMENDATION
Guion Farms Cluster	**48 Rifle Trail**	close
	50 Rocky Ridge Trail	remain open
	52 Sandy Trail	close
	55 Shoal Creek Trail	remain open
	57 Stone Mountain Trail	remain open
	61 Thomas Cemetery Road	remain open & listed with other road maintenance recommendations.
	65 Twin Oaks Trail	remain open
	51 Ruffed Grouse Trail	remain open
	69 Kids Bike Trail	close
Fawn Lake Cluster	**Briery Fork Trail**	remain open & be consolidated into Turkey Knob Trail; received heavy maintenance and some rerouting in 2023
	2 Barn Trail	close
	10 Cart Trail	close
	14 Corn Mill Shoals Trail	remain open
	24 Grassy Meadow Trail	close
	38 Laurel Ridge Trail	remain open
	44 Mine Mountain Trail	remain open
	45 Poplar Hill Loop	partially close
	46 Reasonover Creek Trail	remain open
	54 Shelter Rock Trail	remain open
	64 Turkey Knob Road & Trail	remain open
The planning team assessed several roads being used primarily as recreational trails. These included:	**17 Fawn Lake Loop**	remain open & listed with other road maintenance recommendations.
	35 Lake Imaging Road	remain open & listed with other road maintenance recommendations.
	53 Sheep Mountain Road	remain open & listed with other road maintenance recommendations.
	60 Tarkiln Branch Road	remain open & listed with other road maintenance recommendations.
	61 Thomas Cemetery Road	remain open & listed with other road maintenance recommendations.

Trail Opportunities & Constraints

While the focus of the trails in this report is on their maintenance and the needs of the users, there are several opportunities and constraints regarding the entire trail systems that need to be considered.

OPPORTUNITIES

A mix of trails in relatively sustainable alignment: Many trails have been built with more modern design and construction standards. These trails help with lower maintenance needs and can be changed with less difficulty if reroutes or additions are ever needed in the future. As trails are planned for additions and reroutes, it will be key to continue to design with modern trail standards in mind.

Most trails have adequate access from roads on either end: There is a good network of roads in DSRF that are used for recreation, administration, or both. This network touches nearly every single trail in the Forest giving opportunities for uncomplicated access to personnel, equipment and materials for maintenance and repairs.

Consistent trail density throughout the Forest: The trail density throughout the Forest is relatively consistent from each parking area. The ability of the system to disperse users from the parking area or the first few trail intersections helps spread users out creating a less dense matrix of users the further one ventures into the Forest.

Strong advocates: The advocacy groups working with DSRF have and continue to have a positive impact on trail maintenance, stewardship and fundraising. They also advocate for positive land use policies and the expansion of public lands.

CONSTRAINTS

Frequent water crossings have very few bridges intact: While there are numerous water crossings within the trail system very few of them have bridges crossing them. There are steppingstones across most, but not all water crossings. These water crossings that have no formalized crossing point have areas of bank erosion and social trails created by people seeking the easiest and driest crossing point. The Corn Mill Shoals Trail has an impractical crossing of the Little River. A slick riverbed combined with some rapids and rocks immediately downriver creates a less-than-ideal at-grade crossing for all users.

Expanses of slick rock mixed with user-created trails are creating funnels of water and deep erosion ruts: The large expanses of slick rock at DSRF are a popular attraction for all visitors. They provide distinctive terrain and great views for visitors to enjoy something unique. These slick rock areas act as large, impermeable surfaces, gathering and focusing water and ultimately discharging down the trails. The trails in these zones are often deeply rutted. Reroutes in these areas are difficult with a mix of challenging terrains, protected lands and limited access to equipment and materials.

Several trails are steep user-created alignments: Due to the poor alignments and extreme popularity, long-term more sustainable solutions are critically needed. The steep trails that are a result of users seeking high points, waterfalls, or other positive control points have resulted in alignments that are very difficult to maintain. While re-routes would be the ideal fix for most of these trails, land and habitat protection make that a challenging option. Maintaining these trails is limited to very few alternatives for structural changes, just places for temporary fixes.

The trails are being loved to death: The trails, destinations and access are a major draw to DSRF's one million plus visitors every year. These visitors, while well intended, are seriously impacting the Forest's resources including trails, select streams and riverbanks, and parking capacity. Adding to the impacts are loose Leave No Trace ethos from uneducated users including off-trail travel, poor trail etiquette, littering and other poor backcountry travel tactics.

4.2.3 ROAD CROSSING NEEDS ASSESSMENT

There are several road crossings in the DSRF trail system. Where a trail crosses interior administrative roads there is relatively little traffic volume and lower speeds. However, road crossings with higher volume and higher speed limits lead to some concern with the current crossings, their markings and their signage. North Carolina Department of Transportation does have guidelines in their report; Action Plan for Implementing Pedestrian Crossing Countermeasures at Uncontrolled Locations (see Figure 4-1).

The Annual Average Daily Traffic (AADT) count is beyond this report's scope, but it should be noted that the road crossings at Cascade Lake Road and Staton Road roads do see higher traffic volumes than twenty and even ten years ago as well as relatively higher speeds.

CROSSINGS OF CONCERN:

- Corn Mill Shoals access area across Cascade Lake Road
- Twixt Trail to Rock Quarry Road
- Cascade Loop Across Staton Road
- Sheep Mountain Road from High Falls Parking Complex
- Holly Road Trail crossing from Lake Imaging access area

Figure 4-1: Application of Pedestrian Crash Countermeasures by Roadway Feature—NCDOT Action Plan for Implementing Pedestrian Crossing Countermeasures at Uncontrolled Locations

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	❶ 2 4 5 6	❶ 5 6 7 9	⓪ 5 6 ❼ ❾	❶ 4 5 6	❶ 5 6 7 9	⓪ 5 6 ❼ ❾	❶ 4 5 6 7 9	⓪ 5 6 7 9	⓪ 5 6 ❾
3 lanes with raised median (1 lane in each direction)	❶ 2 3 4 5	❶ ❸ 5 7 9	⓪ ❸ 5 ❼ ❾	⓪ 3 4 5 7 9	⓪ ❸ 5 ❼ ❾	⓪ ❸ 5 ❼ ❾	⓪ ❸ 4 5 7 9	⓪ ❸ 5 7 ❾	⓪ ❸ 5 ❾
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	❶ 2 3 4 5 6 7 9	❶ ❸ 5 6 7 9	⓪ ❸ 5 6 ❾	⓪ 3 4 5 6 7 9	⓪ ❸ 5 6 ❼ ❾	⓪ ❸ 5 6 ❾	⓪ ❸ 4 5 6 7 9	⓪ ❸ 5 6 ❾	⓪ ❸ 5 6 ❾
4+ lanes with raised median (2 or more lanes in each direction)	❶ ❸ 5 7 8 9	❶ ❸ 5 7 8 9	⓪ ❸ 5 8 ❾	⓪ ❸ 5 7 8 9	⓪ ❸ 5 ❼ 8 ❾	⓪ ❸ 5 8 ❾	⓪ ❸ 5 ❼ 8 ❾	⓪ ❸ 5 8 ❾	⓪ ❸ 5 8 ❾
4+ lanes w/o raised median (2 or more lanes in each direction)	❶ ❸ 5 6 7 8 9	⓪ ❸ 5 ❻ 7 8 9	⓪ ❸ 5 ❻ 8 ❾	⓪ ❸ 5 ❻ 7 8 9	⓪ ❸ 5 ❻ ❼ 8 ❾	⓪ ❸ 5 ❻ 8 ❾	⓪ ❸ 5 ❻ ❼ 8 ❾	⓪ ❸ 5 ❻ 8 ❾	⓪ ❸ 5 ❻ 8 ❾

Given the set of conditions in a cell,

\# Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.

○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

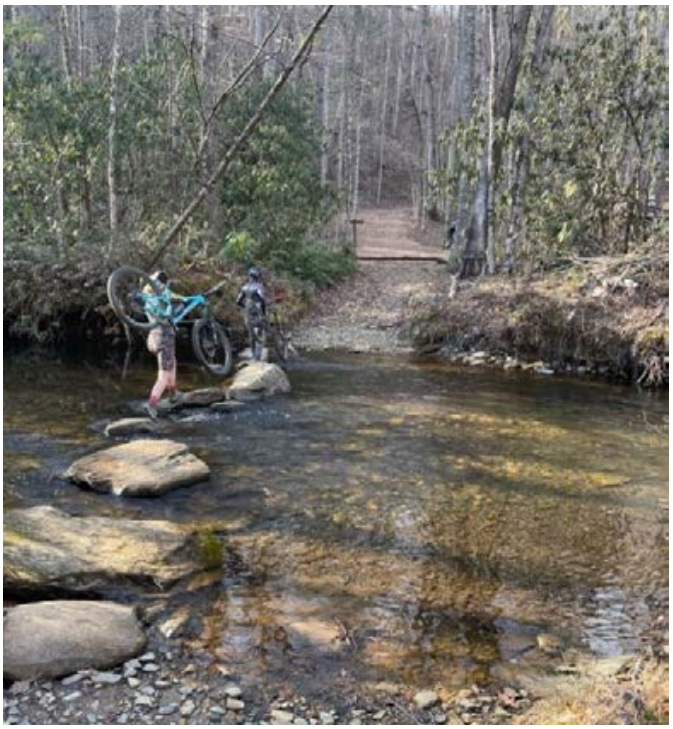
1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Rectangular Rapid-Flashing Beacon (RRFB)**
8 Road Diet
9 Pedestrian Hybrid Beacon (PHB)**

4.2.4 CREEK & RIVER CROSSING NEEDS ASSESSMENT

There are numerous creek and river crossings in DSRF. Most of them are at grade using either a river ford or a boulder causeway for crossings. Some of them have bridges in various states of condition. With flooding, difficult bank and bridge locations and permitting and environmental constraints, it will be difficult to get bridges installed throughout the Forest. As such it is recommended that the crossings have more delineated alignments with boulder causeways or armored bottoms as well as clean and stabilized stream banks (see top image for an example of what this recommendation can look like).

The key to the multiple creek crossings is to provide a clear entrance and exit to the stream. Corralling stones on the stream bank act to guide users across and up the bank as well as provide a weir to help divert high flows off the armored steps and ramps getting users up and out. One side of the corralling stones can align with boulder causeway crossings providing a high and dry option for users on foot. Locating the boulder causeway on the upstream side of the creek gives a bit of downstream protection and a bit of a sediment dump creating a smoother stream bottom crossing. ***The locations that have been identified for potential trail bridge construction, due to ease of access for building equipment and materials transport, include:***

- Pedestrian and mountain bike trail bridge for Reasonover Creek Trail (Lake Julia end crossing)
- Pedestrian and mountain bike trail bridge for Tom's Creek crossing on the Little River Trail
- Equestrians to cross at the ford on Reasonover Creek Trail and Tom's Creek on the Little River Trail



From top: An example of an armored stream bank which keeps users on the right path and helps reduce streambank impacts; Boulder Causeway on Reasonover Creek; Bridge on Cascade Trail

4.3 Trail Network Recommendations

4.3.1 MAINTENANCE RECOMMENDATIONS

Maintenance Labor Approach Recommendations

As trail systems grow, it's important to continue providing access to the places and experiences people expect to see when visiting DSRF.

Trail maintenance helps a trail system work well for its intended use. A rotating system of trail maintenance is an effective way to make sure that trails are consistently in good order. Under this system, the entire trail can be divided into three to five segments, with one segment's trail maintenance needs addressed in one year. The next year, maintenance of the next sequential segment of the trail is addressed, until the entire trail is maintained. A sequential and proactive trail maintenance system should be implemented in the near term and be concurrent with providing the needed deferred maintenance on the most impacted trails noted in the assessment. With this system, trail maintenance costs would be about 5%-10% of capital costs after the recommended sustainable planning and repairs have been implemented.

Currently, DSRF is in a different phase of trail maintenance which is an implemented system for singletrack trails that divides them into groups one being north and the other being south of Joanna Road. These two groups receive alternate maintenance each year. One year the leaves are removed from drains in one group while the other group of trails receives hand maintenance. The following year these actions are switched to the opposite trail group. This allows for trail inspection on an annual basis for singletrack trails and maintenance is performed every other year on each trail. This maintenance is supplemented with maintenance that requires machinery and professional trail work when trail rebuilds are necessary. These zones or network segments are identified as the primary, secondary and tertiary trails for each trail cluster. It is the hope of the planning team that over the course of implementing the Recreation Master Plan trail recommendations, that DSRF will eventually reach the recommended maintenance cost of 5%-10% capital costs, however, this will only be achieved with the assistance of additional funding and resources over the next ten years.

The trail network in DSRF is largely cohesive with a series cluster zones, the trails originating from access areas, receiving most of the traffic. The trails between the access areas, those that exist outside of the cluster trail zone see less traffic. There is a third zone of trails even further away from the parking areas that see even less user traffic and sometimes hardly any user traffic at all. These areas were roughly divided up into the primary, secondary and tertiary trails a user must navigate to get further into the network. These zones are the focus of the trail maintenance efforts with the primary zones receiving the most maintenance, likely annual, the secondary zones receiving maintenance every other year, or as needed, and the third zone receiving maintenance on an as needed basis (see Figure 4-2: Maintenance Zoning Map).

Many communities and counties around the nation employ seasonal trail crews to protect, enhance and maintain their trail investments. A seasonal trail crew can also provide substantial maintenance on the existing trail system over three to four months. Maintenance most likely occurs where the high-impact, high-force trail use takes place. At DSRF this is going to be mostly located in the primary activity zone as well as trails that exist in poorly planned and implemented alignments.

Trail Inspection

It is important to inspect the trails and features (bridges, armoring, causeways, etc.) regularly to ensure the safety of the users and to provide a 'paper trail' to assist in planning and show a duty of care. Inspection helps ensure that changing or unexpected trail conditions are noted early that appropriate action is taken and that the process is methodical and recorded.

Inspection helps to:

- Demonstrate responsible management.
- Show a high duty of care to users and staff.
- Create an audit trail, keeping standards high and allowing effective staff management.
- Provide a safer and more enjoyable visit for users
- Record results to assist provide a paper trail for planning and showing a duty of care.

There is no set rule for how often the trails and features should be inspected, but inspections should occur regularly, depending on:

- Amount of use
- Environment
- Age of feature
- Designer recommendations
- Weather events
- Construction methods

Trail inspections should take place at least once every month, after any busy trail use sessions (e.g. summer holidays or local events), or exceptional weather events. Creation of a trail inspection sheet assesses and documents:

- The point at which a designed feature deviates significantly to increase the acceptable level of risk.
- Where a feature has sufficiently changed to compromise the published user information
- Where user patterns have deviated from the designer’s intentions and pose an unplanned challenge.
- If the trail needs closing or diverting.
- Changes in trail conditions and then take appropriate action.

DUPONT STATE RECREATIONAL FOREST

Trail Maintenance Zones

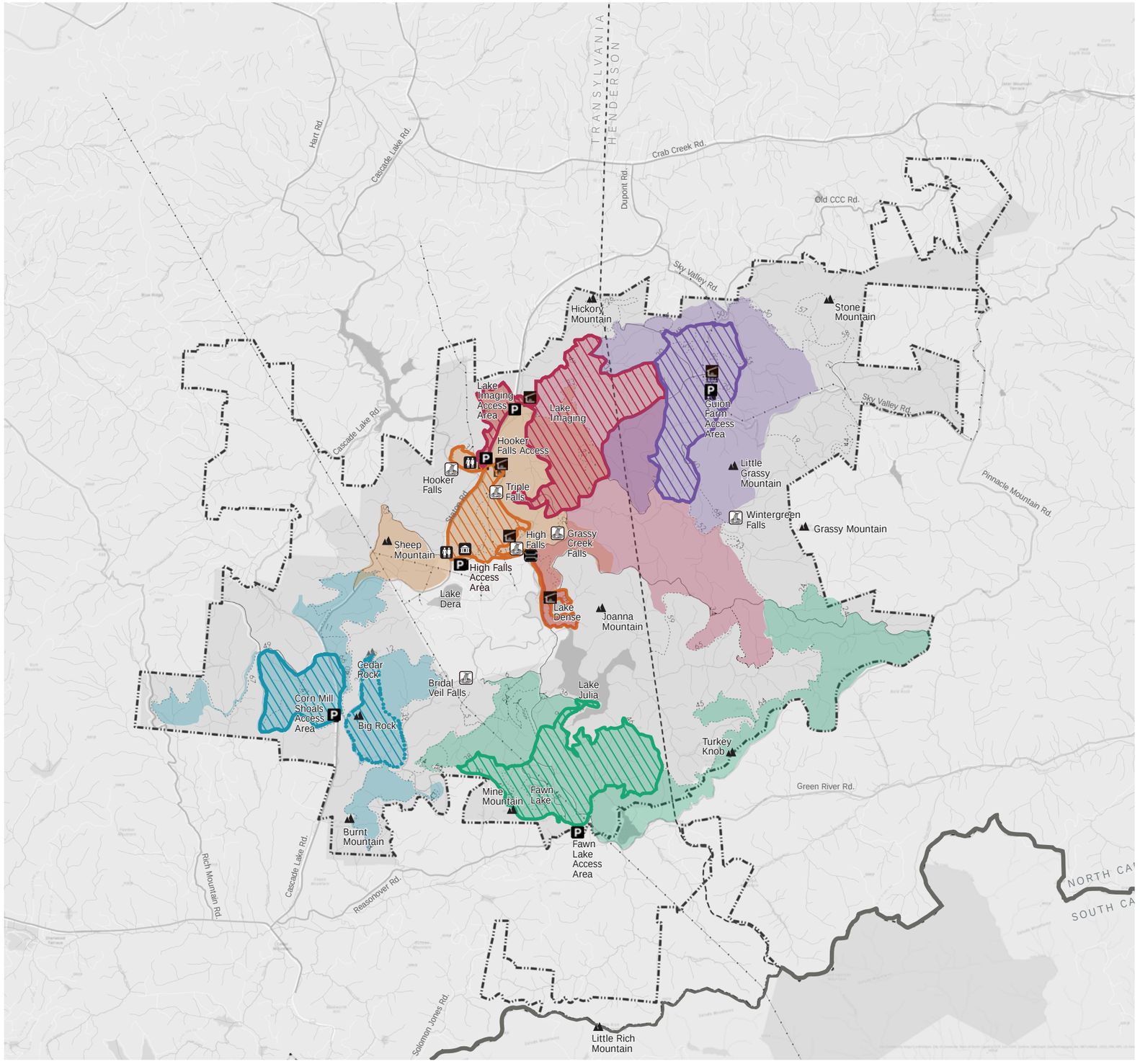


Figure 4-2: Maintenance Zoning Map

LEGEND

- DSRF Boundary
- County Boundaries
- State Boundaries
- Access Area
- Picnic Shelter
- Restrooms
- Visitor Center
- Waterfalls
- Covered Bridge
- Peaks
- Powerlines
- NC State Roads, Paved
- NC State Roads, Gravel
- US Routes
- NC Routes
- Streams
- Water Bodies
- Authorized Access Only
- Guion Farm Core Zone
- Guion Farm Secondary Zone
- Lake Imaging Secondary Zone
- Lake Imaging Core Zone
- High Falls Secondary Zone
- High Falls Core Zone
- Fawn Lake Secondary Zone
- Fawn Lake Core Zone
- Corn Mill Shoals Secondary Zone
- Corn Mill Shoals Core Zone

Trails

1 Airstrip Trail, 1.0
2 Barn Trail, 0.3
3 Big Rock Trail, 0.8
4 Boundary Trail, 0.4
5 Bridal Overlook Trail, 0.5
6 Bridal Veil Falls Road, 0.6
7 Buck Forest Road, 3.2
8 Burnt Mountain Trail, 2.2
9 Camp Summit Road, 0.5
10 Cart Trail, 0.5
11 Cascade Loop, 3.1
12 Cedar Rock Trail, 1.5
13 Conservation Road, 2.6
14 Corn Mill Shoals Trail, 2.7
15 Covered Bridge Trail, 0.2
16 Farmhouse Trail, 0.6
17 Fawn Lake Loop, 0.6
18 Fawn Lake Road, 1.0
19 Flat Rock Trail, 0.5
20 Flatwoods Trail, 0.2
21 Frank Street,0.4
22 Grassy Creek Falls Trails, 0.2
23 Grassy Creek Trail, 0.9
24 Grassy Meadow Trail, 0.9
25 Hickory Mountain Road, 0.9
26 Hickory Mountain Trail, 1.6
27 High Falls Loops, 1.4
28 Hilltop Trail, 1.0
29 Holly Road, 1.3
30 Hooker Creek Trail, 1.6
31 Hooker Falls Trail, 0.4
32 Isaac Heath Trail, 0.8
33 Jim Branch Trail, 1.3
34 Joanna Road, 1.6
35 Lake Imaging Road, 1.5
36 Lake Julia Road, 0.4
37 Lake View Loop, 0.2
38 Laurel Ridge Trail, 0.9
39 Little River Trail, 1.1
40 Longside Trail, 0.8
41 Micajah Trail, 0.4
42 Mine Mountain Trail, 1.4
43 Nooks Trail, 0.4
44 Plantation Trail, 1.2
45 Poplar Hill Loop, 0.6
45 Poplar Hill Loop, 0.8
46 Reasonover Creek Trail, 3.5
47 Ridgeline Trail, 1.4
48 Rifle Trail, 0.5
49 Rock Quarry Road, 1.3
50 Rocky Ridge Trail, 1.5
51 Ruffed Grouse Trail, 1.0
52 Sandy Trail, 0.6
53 Sheep Mountain Road, 1.6
54 Shelter Rock Trail, 0.6
55 Shoal Creek Trail, 1.0
56 Shoals Creek Trail, 1.0
57 Stone Mountain Trail, 1.0
58 Switchback Trail, 0.6
59 Table Rock Trail, 0.9
60 Tarkiln Branch Road, 1.4
61 Thomas Cemetery Road, 1.6
62 Three Lakes Trail, 1.9
63 Triple Falls Trail, 0.4
64 Turkey Knob Trail, 4.5
65 Twin Oaks Trail, 0.9
66 Twixt Trail, 0.4
67 Wilkie Trail, 3.7
68 Wintergreen Falls Trail, 0.5

0 0.5 1 Mile
0 1,500 3,000 6,000 Feet

Using Volunteer & Professional Trail Work

The full volunteer approach with occasional larger project professional work is the current model at DSRF. The volunteers are limited in the days they work in the Forest and the tools they're allowed to use. As such, the volunteers typically only do smaller drainage projects and occasional rock armoring.

Volunteer Trail Maintenance

OPPORTUNITIES

Community Engagement: Involving volunteers fosters a sense of community ownership and engagement.

Cost-Efficiency: Volunteer labor is often more cost-effective than hiring professionals, as volunteers typically contribute their time for free.

Increased Capacity: With a pool of dedicated volunteers, the capacity for trail maintenance work can be increased.

Educational Opportunities: Volunteer programs can provide educational opportunities for participants, raising awareness about environmental conservation and responsible trail use.

CONSTRAINTS

Variable Levels: Volunteers may have varying skill and fitness levels, which can impact the quantity, quality and consistency of trail maintenance work.

Reliability: Volunteer availability can be variable, making it challenging to plan and execute long-term and even short-term, maintenance projects.

Training Requirements: Training is necessary to ensure that volunteers have the knowledge and skills needed for effective trail maintenance. Keeping consistent crew leaders and crews is a challenge with volunteer labor making the training divide wide at times.

Liability Concerns: Managing liability for volunteers can be a concern as volunteers seek to take on additional projects and equipment. Adequate training, safety measures and insurance are necessary to address potential risks.

Professional Trail Maintenance

OPPORTUNITIES

Expertise and Efficiency: Professional trail maintenance crews generally have specialized expertise and greater knowledge, leading to more productive and higher-quality work.

Consistent Scheduling: Professionals can adhere to a regular and consistent maintenance schedule, ensuring that the trail projects are started and completed on a reliable basis.

Equipment and Resources: Professional crews typically have access to specialized equipment, materials and resources. In addition, they have the training to use the equipment and materials in a safe and effective manner.

Liability Coverage: Professionals are covered by liability insurance, reducing the risk for land managers and organizations.

CONSTRAINTS

Cost: Hiring professional labor can be more expensive than utilizing volunteers.

Potential Lack of Community Engagement: Professional crews may not foster the same sense of community and sense of ownership that volunteer programs can create.

Limited Capacity: Professional crews may have limited capacity with shorter notice, making it challenging to address extensive trail networks or large-scale projects. In addition, professional crews may not be able to commit to smaller projects cost-effectively.

In many cases, a combination of both volunteer and professional trail maintenance efforts may be the most effective approach. This hybrid model allows communities to benefit from the expertise of professionals while promoting community engagement through volunteer programs.

The current model at DSRF reflects this hybrid model, but it could be expanded and more specific with larger and more robust planning efforts. These planning efforts should detail projects in the same corridor that volunteers can complete on a separate timeline from the professional crews. Creating a rotating trail schedule with this in mind can expand the maintenance effectiveness of both volunteer and professional crews by taking advantage of each crew's strengths.

Current volunteer presence in DSRF amounts to three to four times per month barring weather or logistic cancellations. The amount of maintenance required in the DSRF trail system could support a second trail crew increasing volunteer maintenance presence to six to eight times per month. It is recommended that a second volunteer crew be organized for even more coverage and impact. This will require new trail crew leaders to be trained and additional volunteers recruited. DSRF will need to help coordinate projects and provide clear direction to all crews to help catch up on the maintenance backlog. It is recommended that additional recreation-focused staff be added to the DSRF staff to assist with the coordination of a second trail crew, volunteer training and volunteer supervision.

There are several mobile apps available to assist with maintenance planning and logistics. They vary in cost and efficacy. As with all data collection apps, the details matter and the more information that can be collected and shared, the better the end project will be.

- The lowest cost option is to utilize a combination of Google Earth™, Avenza™ and Google Sheets™. This can help with planning and coordination but won't automatically populate data across several users. The data must all be shared and entered by hand.
- A low-cost option is to use the mobile app, Gaia GPS™. Gaia™ allows quick data collection in the field as well as geolocated photos. Folders of data can then be shared with different users for implementation in the field. Data sharing can be a little awkward.
- CalTopo™ is a mapping app with good field connectivity that can collect data and be synced and downloaded once back in Wi-Fi coverage. Maps can be created and shared with a common link and downloaded on different devices. As of 2024, CalTopo™ has a geolocated photo option that adds to the previous data collection process of waypoints, tracks and notes.
- Newer products such as Fulcrum™ auto-populate across several users but do have an annual cost per user. Fulcrum™ does provide faster data collection and dissemination making it the easiest to use. It has multiple data collection options including geolocated photos, points, tracks, checklists and work orders.

Effective planning, coordination, clear communication and a well-defined plan can help maximize the strengths of both approaches and address their respective challenges. Mixing the two is often most effective when projects are identified early on for the volunteers to complete like armoring, rock wall construction, smaller drainage work, or even hand-finishing machine-built trail behind professional crews. It is very important to communicate this plan early on during the proposal and bidding process with professional crews and be flexible in both budget and timeline if volunteer labor isn't available when needed.

Next Steps

Maintenance on existing systems typically makes several initial pushes to repair the worst trails and then fill in the gaps later or as problems arise. It is recommended that any flagging, field planning and environmental reviews be done immediately on the recommended trails to finalize plans, budgets and manpower. Any actions that can be worked on concurrently should be done to maintain momentum and get the trails in a more sustainable state. The planning work on the recommended trails should be done by experienced trail planners to create a consistent planning model across all the trails.

- Recruit and train a second volunteer maintenance crew. Coordinate with Friends of DuPont Forest to gauge capacity and interest.
- Utilize a new or existing data collection system in DSRF to begin collecting clear maintenance needs and providing solutions and objectives for volunteers and professional crews.
- Mark and label each point of maintenance in the field with a GPS for a work and planning map.
- Each point should include the type of maintenance required, necessary materials and any equipment needed.
- Create an order of operations and scope of work for Request for Proposals (RFP) for professional crews.
- Highlight projects that can be done by volunteers and what should be done by professionals.
- Create a cost opinion for budgeting.

Trail Maintenance Outlook Recommendations

It is strongly recommended that the maintenance and construction of trails be conducted by a skilled trail construction contractor or well-trained volunteer group. These contractors and volunteers are more likely to understand the specific needs, materials and techniques associated with trail building. The use of contractors primarily experienced in road construction is not recommended as these firms and individuals are not versed in the needs of trail users and recreation-based construction.

Prior to any maintenance and construction, and preferably before the development of bid documents, it is highly recommended that a qualified trail builder with extensive experience developing singletrack trails tightly mark the exact configuration and detailing of turns, tread undulations and frequent grade reversals (among other important trail design elements) with pin flagging, stakes and paint. A thorough plan should also be developed for each trail in need of maintenance. The location of drainage features, armored sections, re-routes and other maintenance features should be marked in the field and called out in type and quantity. Verified alignments should be flagged inter-visibly to delineate corridors that are appropriate for the construction of the trails. This flagging would represent the centerline of a corridor where trail construction could take place, property boundary constraints notwithstanding.

Hooker Falls, Triple Falls, High Falls and Covered Bridge Trails all represent some of the heaviest trafficked and used trails in DSRF. Planning, designing and implementing a formalized, corralled and guided trail experience will give these trails a durable alignment and a durable trail surface to handle the users wanting to see these easily accessed waterfall destinations. Reasonover Creek, Burnt Mountain and Big Rock Trails represent some of the toughest, most extensive and most expensive trail projects on the system.

Reestablishing drains across the trail network would be the maintenance item that would have the greatest positive impact on trail sustainability and be the most cost effective. Armoring, re-routes and tread reestablishment would also provide positive impacts but these more expensive approaches still require proper drainage of the trail corridor to be effective and sustainable.

Big Rock Trail

Burnt Mountain Trail

3 Big Rock Trail

Primary / Secondary Trail Zone

Deberming in spots where significant cupping is apparent. Some small spot drainage work throughout the alignment. Large slick rock drainage spots are adding to point source erosion on the trail. Several large washouts require advanced skills to navigate and will require significant import of materials to harden. Soils and slick rock sections limit the type of redevelopment to traditional Singletrack with limited earthen features.

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8 Burnt Mountain Trail

Primary / Secondary Trail Zone

Deberming in spots where significant cupping is apparent. Some small spot drainage work. Loose armoring and cascade erosion on timbers need to be addressed. The east side requires significant drainage work as all dips are sedimented in and require digging and draining. Mostly more armoring and sustainability additions throughout.

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11 Cascade Loop

Primary / Secondary Trail Zone

Deberming in spots where significant cupping is apparent. Clean out and freshen existing grade dips and knicks. Add more where necessary. Steep road chute with eroded armoring offers unique experiences but continues to erode. Create a narrower chute with a corralled armored surface to maintain experience. Soils and slick rock sections limit the type of redevelopment to traditional singletrack with limited earthen features.

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12 Cedar Rock Trail

Primary / Secondary Trail Zone

Deberming in spots where significant tread cupping is apparent. Drainage work is needed throughout. The large slick rock drainage spots are adding to some point source erosion and will require some armoring and water channeling. It is expected that maintenance be performed throughout the entire trail alignment.

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14 Corn Mill Shoals Trail

Primary / Secondary Trail Zone

Portions of it have been graveled and there is evidence of material migration into drains. Old sandy portions of the trail have some small erosion zones. The Fawn Lake side is quite sustainable with slickrock in steep sections. Can use significant knick and rolling grade dip work throughout to continue to keep the trail dry and functional.

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27 High Falls Loop & 15 Covered Bridge Trail

Primary Trail Zone

Some soil migration and movement due to imported gravel, sandy, sandy loam soil on the steep road zone. Potential for a re-imagining of the entire zone into a more corralled and guided experience. Split fence is doing a good job keeping users on the trail and out of zones they're trying to protect. Drainage rollers are quite abrupt and could be broadened out to where the dip is +/-10' long and equals the size of the roller.

31 Hooker Falls Trail

Primary Trail Zone

Some soil migration and movement due to imported gravel, sandy, sandy loam soil on the steep road zone. Extensive streambank impacts along the Little River below falls. Potential for a re-imagining of the entire zone into a more corralled and guided experience. Split fence is doing a good job keeping users on the trail and out of zones they're trying to protect. Stabilize stream bank impacts with corralling, rock steps, armoring and reroutes. Potential for a Forest path connecting High Falls to Hooker Falls to Lake Imaging to bring pedestrian traffic off of the road.

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38 Laurel Ridge Trail

Secondary / Tertiary Trail Zone

Needs deberming and drainage work done throughout. Some turns were re-built with better and bigger grade reversals above and below, armoring tightened up in a few spots where it occurs and added on some turn entrances and exits. Major grade reversal overhaul, although knicks and rolling grade dip work are performing well. Traffic calming features and meandering on some of the faster and straighter sections. Trees and side slopes can aid in that addition.

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39 Little River Trail

Primary Trail Zone

Older sandy portions of the trail have some small erosion zones and could either be hardened with armoring or surfaced similar to the rest of the trail. The long descent down to the river from the parking lot could use some traffic calming and longer rolling grade dips to take the buck away for cyclists.

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42 Mine Mountain Trail

Primary Trail Zone

Significant deberming and spot drainage work has been performed recently. Turn drainages are very functional but are a hazard in that they are cut across a turning platform for bikes with a log across as a guide. Better drainage above and below turns, rebuilding turns into rolling crown switchbacks, or rerouting and rebuilding turns with better approaches and exits would be better. The long descent towards Fawn Lake Road is limited to its current corridor but could meander for a calmer descent on bikes and better drainage throughout.

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46 Reasonover Creek Trail

Primary Trail Zone

Reasonover Creek switchback turns require a small reroute and retaining wall or a high level of rock armor and retaining walls. The approaches and exits to most turns are steep and encourage user-based and water-based erosion. The repair of several root cascade zones in the system will help harden up the steep root zones and reduce erosion and continued root damage to trees. Deberming throughout the entire trail along with knick and rolling grade dip drainage work will help keep this very popular trail in good shape.

50 Rocky Ridge Trail

Primary / Secondary Trail Zone

Deberming and spot drainage work has been performed recently. Has good grade reversals and drainage features throughout. Needs to see some maintenance along drains and near several cascading root gardens where undercutting is occurring or has occurred. Armoring in a few spots where cascading is occurring. Drainage feature tune-ups above and below turns. Maintaining and adding to the trail meander while keeping long sightlines open will continue to help with this popular trail.

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51 Ruffed Grouse Trail

Primary / Secondary Trail Zone

Significant deberming and spot drainage work need performed throughout. Singletrack portions are flagged out for drainage work. Will require rolling grade dips as the grade is too steep for knicks. Road sections could use knicks in the bottoms of the grade dips to de-berm the compressed soil. Armoring in a few spots. Drainage feature tune-ups above and below turns. Seems that it is a well-used trail by all so ensuring that it maintains a dual direction, multi-use trail in function and experience is key. Traffic calming through meandering and turn selection helps keep bike speeds lower.

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54 Shelter Rock Trail

Secondary / Tertiary Trail Zone

Most areas needing attention have been flagged out for work and have been chipped away by volunteers over the summer and fall. Recommend that work be mechanized to make as big an impact as possible. Larger rolling grade dips and large off-trail drainage paths. Bigger grade reversals above and armoring in a few spots where perennial wet areas occur. Major grade reversal overhaul throughout.

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55 Shoal Creek Trail

Primary Trail Zone

A few drainage features are present and functioning. Some additional maintenance into existing drainage features and the addition of more would benefit the entire trail. Redevelopment to a very specific equestrian user-oriented zone. Both the Farmhouse Trail and Flatwoods Trail are very steep, loose and little used as well. Similar work throughout this zone for general maintenance or revisioning.

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57 Stone Mountain Trail

Tertiary Trail Zone

The trail is largely located in a fall-line alignment with heavy erosion and steep, rocky terrain. Large quantities of rock are available to help formalize the tread and create drainage features where possible. Potential for re-routes either along the entire alignment or around some of the steeper sections. The very top path to the bald requires some steps and drainages to formalize the trail to the viewpoint.

63 Triple Falls Trail

Primary Trail Zone

A lot of soil migration and movement due to imported gravel, sandy and sandy loam soil on the steep road zone. Extensive streambank impacts in sections. Several angler ingress/egress points could be armored. Potential for a re-imagining of the entire zone into a more corralled and guided experience. Work on stabilizing steep fall line sections with armoring or re-routes. Stabilize stream bank impacts with corralling, rock steps, armoring and reroutes. Potential for re-routing steep section to picnic shelter would help with corralling visitors and keeping them off of the streambank lower down.

64 Turkey Knob Road & Trail

Secondary Trail Zone

Drainage work is required along the western road portion. Some flagging along the trail already but could be expanded for more work. The eastern trail section has had significant drainage work performed recently and just needs a slight touch-up. Drainage throughout in the immediate term will help keep water off the trail. Potential for a road-to-trail conversion along the entire road section if additional traffic calming and a smaller trail footprint are desired. Grades are good for incorporating significant meandering with some more grade reversals to help aid in drainage. Recommend a larger excavator paired with a smaller excavator or mini-tracked loader for the road-to-trail work.

65 Twin Oaks Trail

Primary / Secondary Trail Zone

Very little is maintained around Joanna Road on the west end of the trail where the fall line is on the ridge. There is good machine access off Joanna Road for either end of the trail to do some bigger maintenance operations. The singletrack in the middle is in good condition but could use some knick and rolling grade dip work. Road-to-trail conversion along the east end of the trail on an old roadbed. Drainage work on the west end of the trail along the fire break near the ridge or re-route this section further west into singletrack.

For all trails within high-use zones, a high traffic trail plan and implementation can help mitigate social, environment and fiscal impacts:

Durability: Use materials and construction techniques that can withstand heavy use and reduce maintenance frequency.

Capacity Management: Design trails with adequate width and passing areas to accommodate high traffic volumes and prevent congestion

Visitor Experience: Enhance the visitor experience by guiding to amenities such as viewpoints, rest areas and interpretive signage.

Impact Mitigation: Implement strategies to disperse use, such as developing multiple trails or alternative routes to reduce pressure on a single trail. A direct route and a scenic route approach.

Surface Construction: Depending on the intended use, surface the trail with appropriate materials. Options include natural soil, gravel, compacted aggregate, flagstone, or boardwalks for wet or sensitive areas.

Structures and Signage: Construct bridges, boardwalks, steps, railings and other structures as needed. Install signage for trail markers informational displays and safety warning.

OPINION OF COST

Below is the estimate of the cost for the listed trail maintenance recommendations. It is important to understand that these estimates are based on rates and material costs at the time the report was generated.

Trail Maintenance Cost Opinions

TRAIL	BROAD SCOPE OF WORK	LOW	HIGH	PLANNING
3 Big Rock Trail	Erosion control, armoring, user experience	$39,756.42	$47,707.71	$9,860.40
8 Burnt Mountain Trail	Calming, conversion, drainage, armoring	$76,912.48	$92,294.98	$5,623.20
11 Cascade Loop Trail	Calming, drainage, road to trail conversion	$75,011.06	$90,013.27	$6,441.60
12 Cedar Rock Trail	Erosion control, armoring	$78,346.09	$94,015.31	$7,444.80
14 Corn Mill Shoals Trail	Calming, drainage, road to trail conversion	$61,542.92	$73,851.50	$8,289.60
27 High Falls Loop & 15 Covered Bridge Trail	Formalize NPS Style	$1,016,901.75	$1,220,282.10	$169,884.00
31 Hooker Falls Trail	Formalize NPS Style	$244,798.92	$293,758.71	$91,476.00
38 Laurel Ridge Trail	Calming, turns, armoring, drainage	$40,562.41	$48,674.90	$4,593.60
39 Little River Trail	Drainage, armoring, calming	$73,523.59	$88,228.31	$5,860.80
42 Mine Mountain Trail	Re-Route potential instead of armoring	$204,029.09	$244,834.90	$7,708.80
46 Reasonover Creek Trail	Erosion control, armoring, user experience	$140,383.15	$168,459.78	$8,421.60
50 Rocky Ridge Trail	Calming, drainage, armoring on cascades	$57,488.01	$68,985.61	$3,696.00
51 Ruffed Grouse Trail	Calming, drainage, road to trail conversion	$29,303.74	$35,164.49	$3,643.20
54 Shelter Rock Trail	Drainage work and small armoring	$42,610.00	$51,131.99	$3,168.00
55 Shoals Creek Trail	Re-Route and drainage work - equestrian	$40,557.68	$48,669.22	$5,332.80
57 Stone Mountain Trail	Hike optimized trail work/rock work	$195,201.00	$234,242.40	$17,925.60
63 Triple Falls Trail	Formalize NPS Style (See Section 2); includes viewing platforms & permanent staircase	$278,137.44	$333,764.91	$76,032.00
64 Turkey Knob Road & Trail	Calming, conversion, drainage, armoring	$122,496.35	$146,995.62	$7,867.20
65 Twin Oaks Trail	Calming, drainage, road to trail conversion	$54,786.86	$65,744.23	$5,016.00
	TOTAL	**$2,872,348.96**	**$3,446,819.94**	**$448,285.20**

Recreational Road Maintenance Recommendations

DuPont Forest is comprised of several old roads that provide connectivity and a recreational experience for several users. These roads differ from the maintained gravel administration roads in that they typically don't provide connections to administration destinations like buildings, structures, or forestry activity zones and they are typically narrower having not been cleared for vehicle access.

Most of the work prescribed for these roads is intended for mechanized maintenance utilizing small tracked loaders and excavators for the projects. These projects can be done on a singular maintenance contract focusing solely on the roads, or they can be coupled with other trail maintenance projects in these areas. As part of this planning process, the team focused on five recreational roads in DSRF.

17 Fawn Lake Loop – .61 miles

Primary / Secondary Trail Zone

This lightly used road above Fawn Lake provides an alternate connecting contour road above Fawn Lake Road. The work prescribed for Fawn Lake Loop is mostly the installation of Rolling Grade Dips (RGDs) and some maintenance of inboard ditches and under road pipes.

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35 Lake Imaging Road – 1.57 Miles

Primary / Secondary Trail Zone

This heavily used road leading from Lake Imaging Parking Area provides an alternate connection to Buck Forest Road. It also provides key user flow access to Ridgeline Trail, Jim Branch Trail, Isaac Heath Trail and Hilltop Trail. The work prescribed for Lake Imaging Road is mostly the installation of RGDs, some maintenance of inboard ditches/water management features and skilled rock work around the multiple slabs along the road.

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53 Sheep Mountain Road – 1.54 Miles

Primary / Secondary Trail Zone

This medium-use road connects the High Falls Parking Area to Staton Road. It also provides key user access to Cascade Loop Trail. The work prescribed for Sheep Mountain Road is mostly the installation of RGDs but does require some more major work including gabion basket stabilizations and other more advanced water management features.

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60 Tarkiln Branch Road – 1.71 Miles

Primary / Secondary Trail Zone

This medium-use road connects Guion Farms Parking Area to Thomas Cemetery Road. It also provides key user access to Wintergreen Falls Trail and Grassy Creek Trail. The work prescribed for Tarkiln Branch Road is mostly the installation of RGDs, but does include a short reroute, some re-establishment of geogrid and gravel and some other water management features.

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61 Thomas Cemetery Road – 1.57 Miles

Primary / Secondary Trail Zone

This medium-use road connects Buck Forest Road to Tarkiln Branch Road. The work prescribed for Thomas Cemetery Road is mostly the installation of RGDs with several zones needing a raised tread and one bridge requiring inspection and documentation.

OPINION OF COST

Below is the estimate of the cost for the listed Road Maintenance recommendations. It is important to understand that these estimates are based on rates and material costs at the time the report was generated.

Road Maintenance Totals

TRAIL	LENGTH IN MILES	LOW	HIGH	PLANNING
17 Fawn Lake Loop	0.61	$8,125.19	$9,930.79	$483.12
61 Thomas Cemetery Road	1.57	$46,692.16	$57,068.45	$1,243.44
60 Tarkiln Branch Road	1.71	$51,348.93	$62,760.10	$1,354.32
53 Sheep Mountain Road	1.54	$49,955.49	$60,834.81	$1,219.68
35 Lake Imaging Road	1.57	$58,764.56	$71,823.66	$1,243.44
	TOTALS	**$214,886.33**	**$262,417.80**	**$5,544.00**

The health of the trail system is key for the continued and increased sustainability of the Forest. It is recommended that maintenance planning occurs immediately on the trails highlighted with a focus on creating a triage for the trails. Maintenance on existing systems typically makes several initial pushes to repair the worst trails and then fill in the gaps later or as problems arise. Any actions that can be worked on concurrently should be done to maintain momentum and get the trails in a more sustainable state. The planning work on the recommended trails should be done by experienced trail planners to create a consistent planning model across all the trails. Concurrently, the following can be started for the maintenance of the trails:

- Mark and label each point of maintenance in the field with a GPS for a work and planning map.
  - Each point should include the type of maintenance required, necessary materials and any equipment needed.
- Create an order of operations and scope of work for an RFP for professional crews.
- Highlight projects that can be done by volunteers and what should be done by professionals.
- Create a cost opinion for budgeting.
- Recruit and train a second volunteer maintenance crew. Coordinate with Friends of DuPont Forest to gauge capacity and interest.
- Utilize a new or existing data collection system in DSRF to begin collecting clear maintenance needs and providing solutions and objectives for volunteers and professional crews.

4.3.2 PERMANENT TRAIL CLOSURE RECOMMENDATIONS

Several trails were deemed redundant, highly environmentally unsustainable or economically unsustainable to continue to maintain. These trails were reviewed in the field, assessed with DSRF staff and presented to the public for comments at PIDI 3. The trails range in the type of closures recommended based on the reason why they are being closed, their location in the system and the potential impacts of not closing them:

Hard Closure: Trail tread dug up, tree barriers dropped, vertical and horizontal deadfall added, seed and plantings along entirety.

Soft Closure: Hard closure on visual ends of the trail—Trail tread dug up, tree barriers dropped, vertical and horizontal deadfall added, seed and plantings at intersection sightlines.

Passive Closure: Sign removal and cease maintenance practices.

48 Poplar Hill Loop

Recommended Trails for Closure

TRAIL	CLOSURE
5 Bridal Overlook Trail ***Tertiary Trail Zone*** A highly eroded trail with loose, exposed soils on a steep road. The destination is exposed and requires a lot of tree removal to see the falls. No formal destination with large a slick rock area to navigate and a very exposed viewing platform. Heavily eroded at the bottom.	**Hard Closure** *Ends of trail revegetated, trail tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings from intersection sightlines. Heavy erosion control at the bottom.*
10 Cart Trail ***Tertiary Trail Zone*** The Cart Trail is a very steep trail connector between Mine Mountain and Laurel Ridge Trail. This trail is a short and redundant connection between the two trails. Averaging over 18% grade, the highly eroded trail would require significant work and re-routes to make lower maintenance and sustainable. Being located close to the Forest boundary makes re-routes extremely difficult leaving significant tread work as the only option to make sustainable. Closure would free up more labor and options to focus maintenance on other trails in the Forest.	**Hard Closure** *Trail tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings along entirety.*
24 Grassy Meadow Trail ***Tertiary Trail Zone*** The Grassy Meadow Trail is a stand-alone loop connecting Joanna Road to itself in a far corner of the Forest property. This section of Joanna Road is at the eastern end of maintained Forest access and is heavily overgrown. In addition, the Grassy Meadow Trail crosses and is partially located on private property. This private property crossing also contains an unsigned intersection with a trail leading even further off DSRF property.	**Soft Closure** *Ends of trail revegetation, trail tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings from intersection sightlines.*
37 Lake View Loop ***Tertiary Trail Zone*** This short loop is located at the very end of Lake Julia Road and goes around a small peninsula with an existing structure on it. While it does offer lake views, it is short, mostly on the contour and in relatively good shape. It looks like it sees very little use and could be a candidate for abandonment just to remove it from the maintenance rounds.	**Passive Closure** *Sign removal and cease maintenance practices.*

TRAIL	CLOSURE
43 Nooks Trail ***Tertiary Trail Zone*** This short cherry stem-loop is located intersects with the Burnt Mountain Trail and goes around a small oxbow peninsula on the Little River. While it does offer nice forest views, it is short, mostly on the contour and in relatively good shape. Being trapped in the river oxbow and surrounded on two sides by private property it offers no future expansion or connections. It looks like it sees very little use and could be a candidate for abandonment just to remove it from the maintenance rounds. *Note that the Nooks Trail does have several access points to the Little River where a crossing could be better located in future planning efforts. However, the impacts on the acreage and access to materials would have to be explored through the NC Natural Heritage program.*	**Passive Closure** *Sign removal and cease maintenance practices.*
45 Poplar Hill Loop ***Tertiary Trail Zone*** The Poplar Loop is a longer trail that joins the Turkey Knob Trail at a single intersection point. The loop would require significant drainage work throughout its length ranging from simple rolling grade dips to lengthy armoring and potential re-routes. In addition, it goes through a wildlife food plot adding to potential conflict with hunting during hunting season. It does see some traffic, does receive some maintenance efforts and is long enough that there will be some users its removal would impact. The level of work required to bring the trail to a sustainable level would be significant. It is recommended that the effort be put towards making the trail an out-and-back only. Reducing mileage, making it less attractive to users other than hunters and choosing the most sustainable side to keep. The direct length to the food plot would be .75 miles.	**Hard Closure** *Trail tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings along one leg of the loop keeping access to the food plot.*
48 Rifle Trail ***Secondary Trail Zone*** The Rifle Trail is a short connection between Ruffed Grouse Trail and the Boundary Trail. This short connector provides a somewhat redundant cut through by taking trail users off a short section of Hickory Mountain Road. The Rifle Trail stays mostly in a riparian zone along its entire length impacting prime habitat, creating opportunities for stream sedimentation, and requiring a few days of maintenance every year. It is recommended that this trail receive a hard closure along its entire length.	**Hard Closure** *Tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings along its entire length with special attention to the addition of swales and sediment traps to keep soil out of the adjacent waterway.*
52 Sandy Trail ***Tertiary Trail Zone*** The Sandy Trail is a short connection between Grassy Creek Trail and the Tarkiln Branch Road. This short connector provides a somewhat redundant cut through by taking riders off a short section of Wintergreen Falls Trail. The Sandy Trail stays mostly in a riparian zone along its entire length impacting prime habitat, creating opportunities for stream sedimentation, and requiring a few days of maintenance every year. It is currently closed with barriers only. It is recommended that this trail receive a hard closure along its entire length.	**Soft Closure** *Ends of trail revegetation, trail tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings from intersection sightlines. Pay special attention to the addition of swales and sediment traps to keep soil out of the adjacent waterway along the entire trail corridor.*

TRAIL	CLOSURE
59 Table Rock Trail ***Tertiary Trail Zone*** The Table Rock Trail is an out-and-back trail to a large flat area with a few small views of Lake Julia when the leaves are off the trees. The road is relatively steep in several sections and has some erosion issues. There are currently several trees down across the road and as a result, it has seen little to no use in recent years. It is recommended that the Table Rock Trail be closed passively to still allow back-country exploration by equestrians and hikers but not be on the maintenance rotation. This adds less fragmented acreage to the Joanna Road area, providing connections for wildlife and less disturbed acreage for hunters.	**Passive Closure** *Sign removal and cease maintenance practices*
2 Barn Trail ***Primary/Secondary Trail Zone*** Barn Trail has a failing concrete culvert underneath which is leaking. This has caused the collapse of the trail bed. The repair will cost roughly $250,000.00 (to replace the culvert) as well as a lengthy permitting process. The same connections can be made on Shelter Rock Trail. That money can be better spent somewhere else.	**Hard Closure** *Trail tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings along its entire length with special attention to the addition of swales and sediment traps to keep soil out of the adjacent waterway.*
34 Eastern Joanna Road ***Secondary Trail Zone*** The eastern end of Joanna Road eventually connects to Pinnacle Mt. Road. This is severely eroded and seldom used. The closure of Grassy Meadow Trail results in a very low need to access that end of Joanna Road. Keep Joanna Road until just past the intersection with Grassy (turn around point where Grassy Creek and Joanna come together).	**Passive Closure** *Sign removal and cease maintenance practices.*
69 Kids Bike Trail ***Primary Trail Zone*** The Kids Bike Trial is immediately adjacent to the Guion Farms Parking Area. Made primarily of timber, it is in a severe state of disrepair with broken boards, exposed nails and screws, and fallen branches causing hazards throughout. It is recommended that all the wooden features and fasteners be removed from the Forest.	**Soft Closure** *Ends of trail revegetation, trail tread dug up, revegetation, trees dropped, vertical and horizontal deadfall, seed and plantings from intersection sightlines. All wooden features and fasteners are to be removed.*

OPINION OF COST

Trail closures are often good volunteer projects when most of the work is intended to be done by hand. Some of the hard closure work as well as most of the soft closure work can be done by volunteers with standard hand tools. Where machines are needed, like most of the Hard Closure trails, volunteers can work with professional crews or Forest staff doing the finer detail work like revegetation/rehabilitation, vertical deadfall, horizontal deadfall and reseeding.

Trail Closure Totals

SOFT CLOSURES

TRAIL	CONCERNS	LOW	HIGH	PLANNING
5 Bridal Overlook Trail	Environmental Concerns, user interest	$10,280.73	$12,336.87	$945
52 Sandy Trail	Environmental Concerns	$20,290.87	$24,349.04	$945
24 Grassy Meadow Trail	Environmental concerns, user interest	$9,544.94	$11,453.93	$945
Kids Bike Trail	User safety, environmental concerns	$9,795.57	$11,754.68	$945
	subtotals	**$49,912.11**	**$59,894.52**	**$3,780.00**

HARD CLOSURES

TRAIL	CONCERNS	LOW	HIGH	PLANNING
10 Cart Trail	Environmental concerns, user interest	$25,795.91	$30,955.10	$945
45 Poplar Hill Closure & Modification	Environmental concerns, user experience	$70,906.70	$85,088.04	$2,520
48 Rifle Trail	Environmental concerns, user interest	$28,509.32	$34,211.18	$945
2 Barn Trail	Environmental/economic concerns	$20,641.32	$24,769.58	$945
	subtotals	**$49,912.11**	**$59,894.52**	**$3,780.00**
	TOTALS	**$195,765.36**	**$234,918.43**	**$9,135.00**

Next Steps

Trail closures can all be done in a single push as part of a standalone project or tackled along with maintenance practices when personnel and equipment are in the area. Flagging and closure plans can be created in conjunction with any maintenance planning. Closure work on the recommended trails should be done by experienced trail planners to create a consistent planning model across all the trails.

- Mark and label types and areas of closures in the field and on a map for planning and records.
  - *Each point should include the type of closure required, necessary materials and any equipment needed.*
- Create an order of operations and scope of work for an RFP.
- Highlight projects that can be done by volunteers and what should be done by professionals.
- Create a cost opinion for budgeting.
- Identify trails that meet the following criteria for future closures:
  - *Redundant*
  - *High level of unsustainability*
  - *High level of economic unsustainability*
  - *Low use*
  - *Excessive grading and erosion issues*
  - *Water quality issues caused by poor alignment*
  - *Safety concerns*
  - *Very short maintenance cycle that is impractical with staffing shortages*
  - *Level of maintenance and cost necessary to improve a trail's sustainability*

Current Trail Closure Signage

4.3.3 NEW & EXTENDED TRAIL SEGMENT RECOMMENDATIONS

New trail connections and system changes were conceptualized to help alleviate trail conflicts; make new connections and loops; and create a more robust and cohesive system. The trail connections and new alignments are largely focused on the Guion Farms Cluster and the Lake Imaging Cluster. Additional trails have been conceptualized in the recently acquired southern parcel. The recently acquired Cascade Lakes Parcel was reviewed and based on existing uses, numerous water crossings and large intact riparian areas it was deemed to be left alone and not see any trail development. The trails are listed in order of most important additions/changes to least important changes/additions. Trails are listed in order of highest priority and impact to lowest priority/impact.

Recommended New & Extended Trail Segments

1 Ridgeline Intersection Slowdown

Primary Trail Zone

Ridgeline Trail has become one of the favorite trails for mountain bikers in DSRF. It's popularity and notoriety for being a fun descent that capitalizes on the opposing forces a mountain bike can exert on its rider. It sees many times the visitors of other trails in the Forest and dumps out on the rather busy Lake Imaging Road. Speeds can be checked a bit more on the bottom straightaway by introducing some more undulations and reducing radius curves before intersecting with the road. A mix of re-routes, chokes and utilizing some of the adjacent terrain should help mountain bikers slow down even more before the intersection.

2 Jim Branch to Hooker Creek Connection

Primary/Secondary Trail Zone

A connection off Jim Branch Trail towards the top of Hooker Creek would offer a rolling, scenic trail allowing users to bypass the steeper Hooker Creek Trail. This connection would utilize an old logging road intersecting the trail for several hundred feet before beginning to contour over to the top of Hooker Creek Trail. Offering this alternative would allow users to bypass Hooker Creek Trail and avoid the gravel Buck Forest Road. It is recommended that this new loop be managed as a dual direction for equestrians and foot traffic and offer an experience for hikers and equestrians in this busy zone without the dominant presence of bikes found on other trails.

3 Donut Hole to High Falls Connection

Primary Trail Zone

The Donut Hole to High Falls Connection would open a direct access route for people parking in the current overflow parking lot located above Lake DERA. It is estimated that a significant portion of the trail and route will be on a raised boardwalk to keep people corralled on the path and to minimize any soil disturbance in the area. While the pollution looked to be low or no concern in that area, there is some off-gassing concern that would likely require further studies.

4 Southern Parcel Through Trail

Tertiary Trail Zone

The newly acquired southern parcel in DSRF is approximately 720 acres. Using existing roads and old logging roads a through route could be designated and cleared for users to explore the parcel as well as use the parcel as potential access to long-distance trails in South Carolina. It is anticipated that a lot of the route will require some brushing and tread maintenance to drain wet spots and add drainage features. The lands across the state line in South Carolina are part of a Wilderness area where mechanized travel isn't allowed. It is recommended that this zone be open to hiking and equestrian use only with an endpoint (out-and-back) design for the equestrian trails and an option for hikers only to continue onto the DSRF trail network.

5 Southern Parcel East Loop

Tertiary Trail Zone

The east loop in the southern parcel is a mix of existing roads and new conceptual alignments to provide a loop bisected by the Through Trail. This would provide a potentially short or long outing with a potential connection further south into Caesars Head State Park in South Carolina. The lands across the state line in South Carolina are part of a Wilderness area where mechanized travel isn't allowed. It is recommended that this zone be open to hiking and equestrian use only.

6 Southern Parcel West Loop

Tertiary Trail Zone

The west loop offers a longer loop on the western edge of the southern parcel. This trail is conceptualized to be a mix of existing logging roads and new trails making for a trail with a 300' elevation change. This alignment takes advantage of mostly mellower terrain with short bits that traverse some steep side slopes. The lands across the state line in South Carolina are part of a Wilderness area where mechanized travel isn't allowed. It is recommended that this zone be open to hiking use only.

7 Ruffed Grouse to Boundary

Primary Trail Zone

This short half-mile connection offers an alternate entrance down towards the Hooker Creek and Ruffed Grouse intersection from Boundary Trail. It offers a little more mileage and several more alternative loops from the Guion Farms Parking Area. These alternative loops and trails help spread users out in the system creating less congestion and potentially less directional trail wear.

Note that the Wintergreen Falls Trail has a well-established social trail from the end of the Wintergreen Falls Trail up to the base of the falls. Soil migration and movement due to sandy, sandy loam soil could be stabilized with some addition of rock steps and corralling to help stabilize several spots. This improvement is largely focused on environmental improvements to help the streambank from eroding further and putting more soil in the waterway. This zone is a Natural Heritage Area with potential safety hazards being so close to the waterfall making the formalization of this trail legislatively difficult, but necessary.

8 New Parking Development

Tertiary Trail Zone

To support the conceptual southern through trail, southern east loop, southern west loop and southern road developments, the implementation of new parking areas would provide access and parking for Forest users and staff within the Continental Divide property.

OPINION OF COST

New trail construction is often best done by professional crews to expedite the projects and create consistency throughout the new alignments. Volunteers could be utilized on these projects on large workdays helping complete hand finishing or some rock projects but will require careful coordination to keep professional schedules and manpower moving forward. Trails are listed in order of most important to least important to help achieve and maintain further system sustainability.

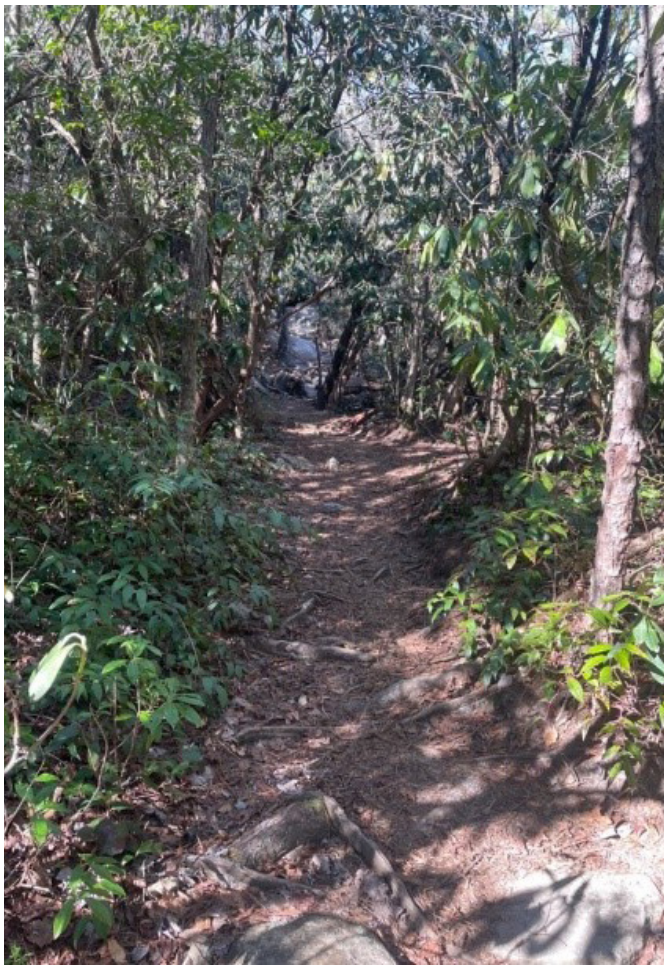
RANK	NEW CONSTRUCTION CONCEPTS	REASON FOR WORK	LOW	HIGH	PLANNING	PROPOSED LENGTH (miles)
1	Ridgeline Intersection Slow Down	User experience, safety—turn stack	$7,390.57	$8,868.68	$630.00	0.05
2	Jim Branch to Hooker Creek Connection	User experience loop options, separation	$68,627.76	$82,353.31	$2,520.00	1.12
3	Donut Hole to High Falls Connection	User experience, parking separation	$349,837.85	$419,805.42	$3,150.00	1.79
4	Southern Parcel Through Trail	Access, user experience, connections	$127,877.18	$153,452.61	$7,358.40	4.38
5	Southern Parcel East Loop	Access, user experience, connections	$109,425.47	$131,310.57	$3,124.80	1.86
6	Southern Parcel West Loop	Access, user experience, connections	$181,225.16	$217,470.20	$4,401.60	2.62
7	Ruffed Grouse to Boundary	User experience, loop options, separation	$34,256.55	$41,107.85	$1,260	0.43
8	New Parking Development	Support Southern Parcel Trail/Road Projects	$125,000.00	$200,000.00	$10,000	-
		TOTAL	**$1,003,640.54**	**$1,254,368.64**	**$32,444.80**	**12.25**

Next Steps

New trail construction will likely take several years to fundraise, plan and perform the necessary environmental reviews. It is recommended that any flagging, field planning and environmental reviews be done immediately on the recommended trails to finalize plans, budgets and manpower. Any actions that can be worked on concurrently should be taken to maintain momentum. The planning work on the recommended trails should be taken by experienced trail planners to create a consistent planning model across all the trails.

- Flag corridor alignments at approximate centerline with intervisible flagging using standard trail industry flagging guidelines.
- Highlight expected construction features such as armoring, rock walls, bridges, causeways, etc.
- Create a short report highlighting trail conditions, trail specifications and any required information for environmental reviews, planning and construction.
- Create an order of operations and scope of work for an RFP.
- Create a cost opinion for budgeting.

Social Trail to base of Wintergreen Falls; Past Trail Construction Efforts



4.3.4 TRAIL NETWORK MANAGEMENT RECOMMENDATIONS

New Trail Management Objectives

Introducing new trail management practices to the public requires a thoughtful and comprehensive communication strategy to ensure understanding, acceptance and compliance.

Stakeholder Engagement: Identify and engage with key stakeholders, including Friends of DuPont Forest, Pisgah SORBA, Backcountry Horsemen of North Carolina and other user groups to communicate the prospective changes. Seek assistance in spreading the word and with peer-level implementation during rollout.

Clear Communication: Develop clear and concise messaging that explains the reasons for the new trail management practices. Emphasize the objectives like the benefits to users, the environment and the community. Utilize a variety of communication avenues, including social media, websites, newsletters and community meetings.

Educational Materials: Create educational materials such as brochures, signage and online resources that explain the new management objectives, rules and guidelines. Use visuals, infographics and maps to make information more accessible, engaging and understandable.

Demonstrations & Guided Tours: Organize on-site guided tours with stakeholder partners to showcase the benefits of the new management practices. This can help users understand the changes and experience firsthand how the practices enhance their trail experience.

Trial Periods &/or Pilots: Consider implementing the new practices on a trial basis or through pilot programs. This allows users to experience the changes in a controlled environment and provides an opportunity for management adjustments based on feedback.

Feedback Mechanisms: Establish clear channels for feedback and encourage users to share their thoughts and experiences. Use surveys, online forms, or dedicated email addresses to collect input. Demonstrate a commitment to incorporating valuable feedback into ongoing trail management

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Consistent Messaging: Maintain consistency in messaging across all communication channels. Ensure that the information is accurate, up-to-date and aligned with the goals of the trail management practices.

Adaptability & Flexibility: Be open to making adjustments based on user feedback and evolving needs. Demonstrate a willingness to adapt the trail management practices to address concerns and improve the overall user experience.

By approaching the introduction of new trail management practices with transparency, engagement and a focus on education, a positive reception within the community will increase the likelihood of successful implementation. The decision to roll out new trail management practices all at once or gradually over time depends on the changes, the level of stakeholder involvement and the capacity for effective communication and implementation

Rolling Out All at Once

OPPORTUNITIES

Clear Transition: Rolling out changes simultaneously provides a clear and definitive transition to the new trail management practices for users.

Efficiency: Several of the recommended changes are interconnected and dependent on each other, implementing them all at once may be most efficient.

Consistency: Ensure consistency in the application of new management objectives across the entire trail system.

Immediate Impact: Users experience the full impact of the changes immediately. While potentially most painful for users, it can lead to quicker adaptation.

CONSTRAINTS

Possible Resistance: Users may experience a sudden shift in their accustomed routines and routes, leading to resistance or confusion.

Communication Challenges: It could be more challenging to communicate all aspects of the new objectives simultaneously, increasing the risk of misunderstandings.

Overwhelming: Users and stakeholders might feel overwhelmed by a comprehensive set of changes, leading to a slower adoption rate.

Gradual Roll Out

OPPORTUNITIES

Adaptation: Users have time to gradually adapt to the new management objectives, reducing the potential for resistance.

Incorporate Feedback: Rolling out changes gradually allows for feedback and adjustments based on real-world experiences from users and managers.

Better Communication: It enables more detailed communication about specific changes, reducing the risk of information overload.

Stakeholder Involvement: Stakeholders can be more actively involved in the process, providing input and support as changes are introduced.

CONSTRAINTS

Longer Transition Period: The transition to the new trail management practices may take longer, potentially delaying the realization of certain benefits and becoming a drag on Forest resources.

Likely Inconsistency: A period of inconsistency if some trails or areas have new practices while others continue with the old system.

Complexity in Implementation: If changes are interdependent, a phased approach could lead to complexity in implementation leading to confusion and potential resistance to adaptation.

Directional Trail Management

Directional trail management refers to the practice of designating specific directions (e.g., one-way or multi-directional) for trail use. As with all trail management decisions, it has its opportunities and constraints.

OPPORTUNITIES

Safety: Designated directional trail systems can enhance safety by reducing the likelihood of head-on conflicts between trail users. By recommending directions of travel for different users, anticipations around trail interactions can be created.

User Experience: Directional management can improve the overall user experience by creating a more predictable and controlled environment. Users can better anticipate encounters with others, leading to a smoother and more enjoyable experience.

Reduced Conflict: By establishing specific directions for different user groups, conflicts between fast and slow-moving users can be minimized. This is especially relevant in areas where there is a mix of activities such as hiking, cycling and horseback riding.

Environmental Conservation: Directional management can help reduce environmental impact by concentrating trail use in specific directions. This can prevent the widening of trails, some user-based erosion and minimize damage to sensitive ecosystems.

Efficient Trail Design: One-way trails allow for more efficient trail design and management, as designers and managers can focus on enhancing the trail for a specific direction, considering factors like elevation changes, natural features, intersections and control points.

CONSTRAINTS

Limited Variety: Directional trails may limit the variety of experiences for users, especially if they are only allowed to travel in one direction. While loops and out-and-back trails will still exist, there will be some impacts. In addition, there will be a reduction in mileage for certain users by removing the two-way aspect of trails.

Access Challenges: Users may face challenges accessing specific parts of a trail system if it is designed with one-way trails. This can become a constraint for users who want to explore different sections of a trail.

Implementation Challenges: Implementing and enforcing directional trail management can be challenging. It will likely require effective signage, communication, enforcement and cooperation from trail users.

Resistance from Users: Some users may resist directional management if it disrupts their accustomed patterns or favorite routes. This is especially likely given that the system at DSRF has been multi-use and bi-directional since its inception. Education and communication are essential to gain user acceptance.

Maintenance Considerations: Maintenance efforts may be more challenging on one-way trails, as crews need to access and work on the trail from specific entry points. This can impact the efficiency of maintenance operations and the movement of crews around the system.

Directional Trail Management Public Input

At the Public Information Drop-In #3 (PIDI #3), participants were asked to indicate their preferences on what management technique they were most supportive of. Of the 119 preferences cast, 52 were cast for a minimal level of change while 49 were cast for the most level of change. 13 preferences were cast for some level of change and 5 were cast for more level of change. Below are the details of the two options that received the highest number of preferences at PIDI #3:

	MINIMAL LEVEL OF CHANGE	MOST LEVEL OF CHANGE
Mountain Bikers	Downhill on Ridgeline Uphill (clockwise) on Jim Branch Downhill (clockwise) on Hilltop	Downhill on Ridgeline Uphill (clockwise) on Jim Branch Downhill (clockwise) on Hilltop Downhill (counterclockwise) on Rocky Ridge Trail Counterclockwise on Reasonover Creek Trail Downhill (counterclockwise) on Grassy Creek Trail
Equestrians	Downhill (counterclockwise) on Jim Branch Downhill (counterclockwise) on Hilltop Counterclockwise on Isaac Heath	Downhill (counterclockwise) on Jim Branch Uphill (clockwise) on Rocky Ridge Trail Counterclockwise on Hilltop Clockwise on Reasonover Creek Trail
Hikers / Runners	Uphill on Ridgeline	Uphill on Ridgeline

DuPont State Recreational Forest Multi-Use Instructional Signage

Directional Trail Management Recommendations

It is recommended that some level of change be rolled out all at once with clear communication, engagement of stakeholder partners and a pilot enforcement program utilizing a mix of trail users and DSRF personnel. This is represented below:

MOUNTAIN BIKERS

- Downhill on Ridgeline
- Uphill (clockwise) on Jim Branch
- Downhill (clockwise) on Hilltop
- Counterclockwise on Reasonover Creek Trail

EQUESTRIANS

- Multi-directional on Jim Branch Trail to allow for more options for equestrians and hikers with the Jim Branch to Hooker Creek Connector Trail
- Counterclockwise on Hilltop
- Clockwise on Reasonover Creek Trail

HIKERS / RUNNERS

- Uphill on Ridgeline

Existing Directional Trail Management within DSRF

Designated Trail Management

Designated trail management involves assigning specific trails for certain activities or user groups, aiming to organize and optimize the use of outdoor recreational spaces.

OPPORTUNITIES

Safety: Designating uses on specific trails can enhance safety by reducing the likelihood of conflicts between users with different speeds or modes of transportation.

User Experience: Designated trail management can improve the overall user experience by providing simplicity and predictability. Users can choose trails based on their preferred activities, leading to a more enjoyable outing.

Environmental Conservation: By designating specific trails, land managers can focus conservation efforts on vulnerable areas while concentrating recreational impact on more durable surfaces and sustainable alignments. This helps minimize damage to sensitive environments and soils.

Resource Management: Designation allows for more effective resource management, including trail maintenance, signage and the allocation of amenities (e.g., rest areas, parking) to specific trails and trailheads/ parking areas.

Improved Trail Design: Trail designers can optimize designated trails for specific activities, incorporating features and challenges that align with the intended use. This can lead to a better and more appealing experience for users.

CONSTRAINTS

Limited Access: Designating trails for specific activities may limit access for certain user groups. Those who enjoy multiple activities may find restrictions frustrating having to switch between modes of travel and even parking areas in a single outing.

User Resistance: Users may resist designated trail management if it limits their freedom to choose routes or engage in activities they enjoy. Communicating with and educating users about the reasons for designations is crucial for acceptance.

Enforcement Challenges: Enforcing designated trail use can be challenging, especially in larger recreational areas. Unauthorized use may occur, leading to conflicts between users and a potential strain on enforcement resources. This is especially true early in the implementation of designated trails within the system.

Seasonal Changes: Designated trail use may not account for seasonal changes or temporary closures needed for ecological restoration or other reasons.

Trail Maintenance Complexity: Managing multiple designated trails may increase the complexity of trail maintenance efforts. Each trail may have unique requirements based on its uses and resources must be assigned accordingly.

Balancing User Groups: Striking a balance between different user groups' needs and preferences can be challenging. Accommodating different uses on different trails will require careful trail planning and communication.

Designated trail management can offer improved safety, user experience and environmental conservation. Constraints related to limited access, user resistance, enforcement and maintenance complexities must be addressed to ensure the success and acceptance of any new management strategy.

Designated Trail Management Public Input

At the PIDI #3, attendees were asked to indicate their preferences on what designated trail management technique they were most supportive of. Of the 119 preferences cast, 58 were cast for a minimal level of change while 33 were cast for the most level of change. 8 preferences were cast for some level of change and 20 were cast for more level of change.

USER	MINIMAL LEVEL OF CHANGE	MOST LEVEL OF CHANGE
Mountain Bikers	No access to Thomas Cemetery Road (equestrian/hike)	No access to: Thomas Cemetery Road, Shoal Creek, Farmhouse, Flatwoods, Boundary & Ruffed Grouse Trail (equestrian / hike) No access to High Falls Loop (bike rack parking (equestrian / hike)
Equestrians	No access to Ridgeline Trail (bike/hike)	***Add future equestrian trail segments or trails:*** Around Upper Hooker Creek Trail to connect to the below trails to create additional equestrian / hike only mileage: 1. Jim Branch to Hooker Creek Connector Trail & Ruffed Grouse to Boundary Connector Trail 2. Boundary Trail 3. Ruffed Grouse Tail No access to Ridgeline, Lower Hooker Creek, Grassy Creek poor soils for equestrian use) & Turkey Knob Trails (bike/hike)
Hikers / Runners	Upper Stone Mountain Trail, Hooker Falls Trail, Triple Falls Trail, Grassy Creek Falls Trail (hike/ pedestrian only)	Upper Stone Mountain, Grassy Creek Falls, Triple Falls & Hooker Falls Trails (hike / pedestrian only)
Parking		Encourage equestrian parking at Guion Farm Access Area Encourage bike parking at Lake Imaging Continue to foster reservation parking /camping for equestrian groups at The Barn Facility in the Forest interior

Designated Trail Management Recommendations

While the public did indicate preferences for the minimal level of change, this also ranked lowest for changes for increased sustainability of the trail system and continues to promote the current status quo. To increase the environmental, social, financial and managerial sustainability of the system it is recommended that more level of change be implemented.

MOUNTAIN BIKERS

- No access to: Shoal Creek, Farmhouse and Flatwoods (equestrian/hike)
- No access to Stone Mountain Trail (hike only)
- No access to High Falls Loop (bike rack parking (equestrian/hike))

EQUESTRIANS

- Add future equestrian trail segments or trails. Connect to:
    1. Jim Branch to Hooker Creek Connector Trail
    2. Ruffed Ground & Boundary Trail connectors to create additional equestrian/hike only mileage.
    3. Southern Parcel East Loop & Southern Parcel Through Trail
- No access to Ridgeline, Hooker Creek, Rocky Ridge & Grassy Creek Trails (poor soils for equestrian use. Bike and hike only)

HIKERS / RUNNERS

- Upper Stone Mountain, Grassy Creek Falls, Triple Falls, & Hooker Falls Trails (hike / pedestrian only)
- New trail segments: Southern Through Trail (northern portion) and South Parcel West Loop

PARKING

- Encourage equestrian parking at Guion Farm Access Area by removing equestrian only zone at Lake Imaging Parking.
- Add equestrian parking at the Continental Divide area to provide access to the new South Parcel Through Trail & East Loop.
- Encourage bike parking at Lake Imaging by expanding into the current equestrian-only areas.
- Continue to foster reservation-based camping for equestrian groups at The Barn Facility in the Forest interior.

Odd or Even Day Designated Use

Odd or even days for trail management refers to alternating use of trails by different user groups on specific days of the week. Other calendar management techniques can involve month-long time frames between alternating users, directions, or both. With the changing seasonal trail and weather conditions it is recommended that any calendar type of management at DSRF be odd/even days only.

The odd or even-day system can offer reduced conflict, enhanced safety and better resource management while not excluding any one user group from individual trails. Challenges related to limited access, user resistance, enforcement, inflexibility and communication must be carefully considered and addressed to ensure the success of this trail management approach.

An odd/even approach could help keep the trail system status quo as close as possible to what it is currently. The DSRF management has expressed concern over the implementation and enforcement of an odd/even management approach. This is due to several factors such as highly ingrained historical use, high amounts of general use, large numbers of national and international visitors, inadequate staffing levels and high demands on current staff. In addition, the current infrastructure and trail design lacks the ability to adequately establish or enforce the odd/even approach as it has many entry points, an interconnected and overlapping trail system and an overall complex design. A calendar management approach is not recommended for DSRF at this time.

OPPORTUNITIES

Reduced User Conflict: By assigning specific days to different user groups, this management objective can reduce conflicts between users with varied interests or speeds.

Safety: Alternating trail use can enhance safety by minimizing encounters between user groups with varying speeds.

Predictability: Users can plan their outings with greater predictability, knowing which days are designated for their preferred activities.

CONSTRAINTS

Limited Access: Users who enjoy multiple activities may find the odd or even day system restrictive. If someone enjoys both hiking and mountain biking, they may be limited to using specific trails on specific days.

User Resistance: Some users may resist the odd or even day system if it imposes restrictions on their preferred activities or disrupts their usual routines leading to non-compliance and potential conflicts.

Enforcement Challenges: Enforcing the odd or even day system can be challenging if spread out over a large recreational area.

Inflexibility: The system may be less flexible in accommodating spontaneous or unplanned outdoor activities. Users may be discouraged from using the trails on days that don't align with their preferred activities.

Communication Challenges: Clear communication and signage are crucial for the success of odd or even day trail management. Users need to be well-informed about the system to avoid confusion and ensure compliance.

Seasonal Considerations: The odd or even day system may not account for seasonal changes or special events that warrant temporary changes to trail use patterns. Flexibility is important to address evolving needs around events, maintenance approaches, or seasonal/temporary closures.

Trail Network Management Overall Recommendations

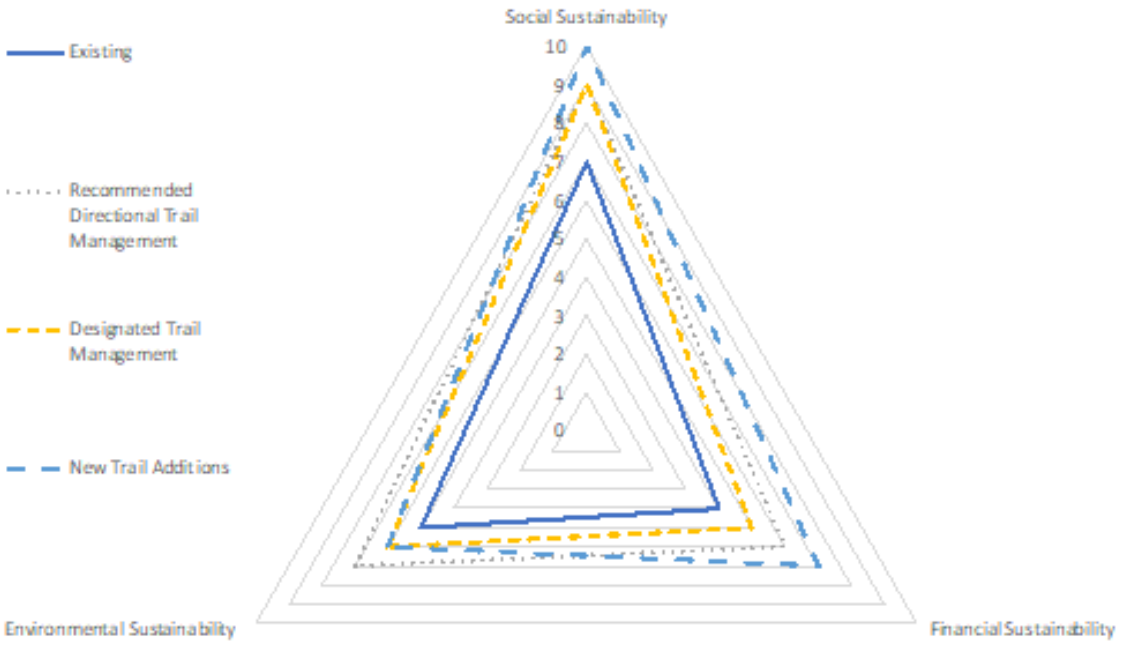
By approaching the introduction of new trail management practices with transparency, engagement and a focus on education, a positive reception within the community will increase the likelihood of successful implementation. It is recommended that the changes highlighted in this report be mapped and shared with the public as soon as the plan is accepted. As soon as DSRF staff assess the administrative requirements, infrastructure requirements and any other needs the management changes should be rolled out. The most important management changes are the trails that pose a significant hazard for users and a significant impact on the environment. Designation of trails and managed direction of trails can be implemented concurrently.

It is recommended that the road crossings receive traffic counter data collection to make sure that the existing road crossings are up to standards and based on current road use.

It is recommended that an additional ranger be brought on at DSRF to help manage the needed maintenance, closures, new trail construction and management changes. This will include triage and planning coordination; RFP and contract administration; oversight of professional and volunteer maintenance efforts; patrolling and educating users on the new objectives; and providing an additional interface between the DSRF staff and the public.

Each recommended change does result in improved sustainability across DSRF. The current sustainability status at DSRF is relatively weak in terms of financial sustainability and environmental sustainability with a high need for maintenance and numerous trails in poor condition. Following the maintenance needs highlighted, developing the new trails highlighted as well as incorporating the recommended management changes could result in a much stronger trail system sustainability.

Sustainability Scoring Chart



4.4 Recreational Trends Analysis and Recommendations

4.4.1 ELECTRIC MOUNTAIN BIKE RECOMMENDATIONS

Electric mountain bikes (eMTBs) continue to be a hot topic for land managers and public lands across the US. While there have been many places with successful and sustainable rollouts of effective eMTB policy, DSRF and all the trail users have shown a reluctance to introduce them at this time. While this disinterest seems to be primarily local, it should be noted that a state-level rollout of e-bikes and eMTBs could impact how DSRF manages them.

At PIDI #3, attendees were asked to indicate preferences on what level of eMTB policy they were most supportive of. Of the 138 levels of preferences indicated, 77 were cast for a minimal level of change while 42 were cast for the most level of change. 5 preferences were cast for some level of change and 14 were cast for more level of change. This feedback indicated that the most frequent and knowledgeable users of DSRF maintain a concern about the compatibility of eMTBs on DSRF.

The Recommended Approach to eMTBs is described below.

Minimal Level of Change

- eMTB and motorized vehicles are not allowed on shared trails & roads within DSRF.
- Allowed on the perimeter gravel roads connected to the Forest such as Sky Valley Road, Pinnacle Mountain Road, Cascade Lake Road and Green River Road (current status quo).

This level represents no change in the status quo of the Forest currently. This recommendation is based on several factors such as:

- The public opinion for minimal designation (eMTBs require greater designation to reduce negative trail encounters)
- The current trail infrastructure (current trails are narrow and multi-use which is not compatible with higher speed technology)
- The social sustainability (eMTB's potential speeds mixed with other user groups on the trails could increase social conflicts)

Mountain Bikers on Non-Electronic Bikes in DuPont State Recreational Forest

Future Considerations

The planning team's assessment of trends and research indicates that eMTB popularity and affordability will continue to increase. It is important for DSRF to be prepared for projected growth, management techniques and management challenges.

Laws vary at the federal, state and municipal levels for the use of eMTBs off-road:

- Federal law states that eMTBs are classified as motorized vehicles and are only allowed on motorized trails, including Bureau of Land Management (BLM) and National Forest (USFS) lands.
- The state of North Carolina (NC) defines eMTBs as "electric-assisted bicycles," so long as the e-bike's motor is under 750w, has a maximum speed of 20mph and has operable pedals. The same rules of the road apply to both eMTBs and human-powered bicycles. North Carolina State law has no specific legislation and does not specifically address whether electric bicycles are allowed on bike paths.
- North Carolina State Parks states that eMTBs are allowed on all trails where traditional bikes are allowed. The speed limit on all trails is 25 mph.[25]

EXISTING eMTB & E-BIKE TRAILS IN THE REGION	
Kanuga Bike Park *Hendersonville*	Natural surface trails. Privately owned bike park open to the public.
Rock Creek Bike Park *Zirconia*	Natural surface trails. Privately owned bike park open to the public.
Ecusta Trail *current & future plans; will connect Brevard & Hendersonville*	Soft surfaced recreational rail trail connecting communities.
Swamp Rabbit Trail *Traveler's Rest, SC*	Hard surface recreational rail trail connecting communities.
Gravel Roads within DSRF's Boundary	Soft-surfaced public roads open to motorized vehicles. Excludes interior gravel roads that are multi-use routes.
Extensive gravel road system in Lake Jocassee area	Soft surfaced public roads open to motorized vehicles.
Remote Vehicular Gravel Roads in Pisgah National Forest	Soft-surfaced public roads open to motorized vehicles. Limited to roads not gated closed.
Okolawaha Greenway in Hendersonville	Hard surface recreational rail trail connecting communities.
Estatoe Trail in Brevard	Hard surface recreational rail trail connecting communities.

eMTB Access Implications for Land Managers

The Federal Highway Administration has recently released a report that "...highlights key findings as they relate to the four research focus areas defined in the Study Methodology, a framework used to organize considerations about eMTB on public lands regarding: (1) Ecological, Cultural and Historical Resources; (2) Safety factors; (3) Social factors; and (4) Processes for e-bike Management. These findings are based on an in-depth review of published studies identified by the planning team and stakeholders as well as conversations with land managers who have first-hand experience with eMTB in a public land's context." [26]

Key takeaways from the report explore the Ecological, Cultural and Historical Resource Impacts; Safety Impacts; Social Impacts; and Processes for E-Bike Management:

Ecological, Cultural & Historic Resource Impacts Considerations & Opportunities

KEY FINDINGS	AREAS FOR FURTHER RESEARCH
• One primary study was conducted on e-bike impacts—e-mountain bike (eMTB) specifically—on natural surface trails, which demonstrated no significant difference in soil displacement between eMTBs and conventional mountain bikes. • Research on conventional bike impacts shows that their presence can disturb wildlife and impact ecosystems but less than other activities; e-bike impacts are expected to be similar but limited research is available. • EMTB may serve as an effective alternative to motor vehicles and reduce tailpipe emissions; installing charging stations in public lands could power eMTB using renewable energy sources.	• There is only one significant study on the impacts of eMTBs on natural surface trails. Additional experimental research is needed to better understand the impacts e-bikes may have on such trails and whether and how they differ from other trail uses. • There is little research on whether eMTB have different impacts on cultural and historical resources when compared to conventional bicycles. • Prior research on mountain bikes could inform the methodologies researchers use to focus on future eMTB studies.

Table 4-1: Ecological, Cultural and Historical Resource Impacts, Considerations and Opportunities

Processes for eMTB Management

KEY FINDINGS	AREAS FOR FURTHER RESEARCH
• Bicycle advocacy organization People for Bikes asserts that eMTBs are similar enough to conventional bikes that they do not warrant different trail design standards. They refer to industry standards for sustainable mountain bike trail design and trail building process as a resource for land managers. • There is limited published information on agency coordination of managing e-bike use. However, conversations with existing land managers demonstrate the value of frequent and recurring coordination to effectively manage e-bike use in public lands.	• Further research is needed to determine if trail design standards need to be modified to accommodate the unique characteristics and rider behaviors on eMTB. • Additional research is needed to determine how land management agencies coordinate the management of eMTBs with other governments and private enterprises. This includes studying best practices in how Federal and State regulations can better align with one another.

Table 4-3: Process for eMTB Management

Safety Impacts, Considerations & Opportunities

KEY FINDINGS

- Overall e-bike injury and conventional bike injury patterns are similar, though e-bikers tend to be older and have a higher rate of brain trauma injuries.
- A recent study found that e-bike and powered scooter injury patterns differ from conventional bicycles. E-bike-related injuries were more than three times as likely to involve a collision with a pedestrian than either pedal bicycles or powered scooters.
- Research suggests that crash risk is similar between Class 3 and Class 1 eMTB; however, injury severity tends to be higher among Class 3 e-bikes.
- eMTB may help to fill an important role as emergency response vehicles and support search and rescue teams operating in remote areas.
- eMTBs require less physical exertion than conventional bicycles and has the potential to support independent mobility for older populations and individuals with mobility impairments.
- The high upfront cost of eMTB is a barrier to e-bike ownership and ridership.
- Surveys demonstrate that some public lands users fear interactions with eMTB on public lands, based on perceived risks.
- MTBs allow people to ride more miles and/or over a longer period, increasing the potential benefits and impacts of bicycle use in public lands.
- eMTBs provided by rental companies may encourage use by novice riders who are unfamiliar with e-bike operation and safety.

AREAS FOR FURTHER RESEARCH

- Further research could examine the safety differences between conventional bicycles and different classes of eMTB.
- Further research could study the difference in safety risks between e-bike classifications. Specifically, research could examine whether the presence of a throttle on Class 2 eMTB has an impact on safety for users.
- Additional research could consider typical pre-crash conditions on natural surface trails to determine whether they differ from conditions on paved surfaces.
- Further research is needed to examine if and how eMTBs change visitor use patterns on public lands. This research could address how increased e-bike use in public lands may affect resources and other recreational activities and users.
- Additional research may focus on what educational resources could be disseminated to public land users to promote proper etiquette.

Table 4-2: Safety Impacts, Considerations and Opportunities

Market Trends

The eMTB market is one of the fastest growing in cycling. Cycling, in general, grew 6.5% in 2021/22 with e-biking being the fastest-growing aspect of the sport. Some estimates have e-bike growth at sixteen times that of analog bike sales. Market trends look to be on the rise and continuing to rise:

- The E-Mountain Bike Market size is expected to grow from USD 5.13 billion in 2023 to USD 9.27 billion by 2028, at a Compounded Annual Growth Rate (CAGR) of 12.56% during the forecast period (2023-2028).
- Over the longer term, the eMTB bike market is growing rapidly as the younger generation shows interest in trekking and recreational activities. However, factors like government regulations regarding speed and safety issues associated with these bikes are likely to hinder the market's growth. For instance, The Union Cycliste Internationale (UCI) adopted strict regulations regarding the electric motors on eMTB, which must not exceed 250 watts. Pedaling assistance is only permitted to a maximum speed of 25 kph.
- Mobility plays a vital role in the current society that we live in. With the growing concern for preserving and sustaining it for future generations, mainly because of the increasing scarcity of natural resources and environmental concerns, protecting the environment poses a significant challenge to society and governments worldwide.
- As a result, the rising demand for eMTBs is an ideal solution to the challenge. With the continually growing environmental and health concerns due to the increasing emission levels, governments and international organizations worldwide are enacting stringent emission norms to reduce carbon emission levels.
- Owing to this, some international organizations worldwide are implementing strict criteria for vehicles. For instance, In January 2020, the European Union implemented Regulation (EU) 2019/631, setting CO2 emission performance standards for new passenger cars and vans. The average CO2 emissions from new passenger cars registered in Europe have decreased by 12% compared to the previous year and the share of electric vehicles tripled.
- Additionally, the depletion of fossil fuel levels at an alarming rate has been creating concerns for sustainability for future generations. This factor is posing a huge challenge for governments and society.
- Over the years, the sales of eMTB have increased rapidly due to the rise in fuel costs, which has led to the growth of the implementation of electric bicycles as a daily means of transport. Switzerland is considered one of the best trekking places. Players in the market are launching lighter and rugged e-MTBs with massive batteries, better comfort, improved range and better features to widen their customer base.
- Considering these factors and development, demand for eMTB is anticipated to register a higher growth rate during the forecast period. [27]

Public Input

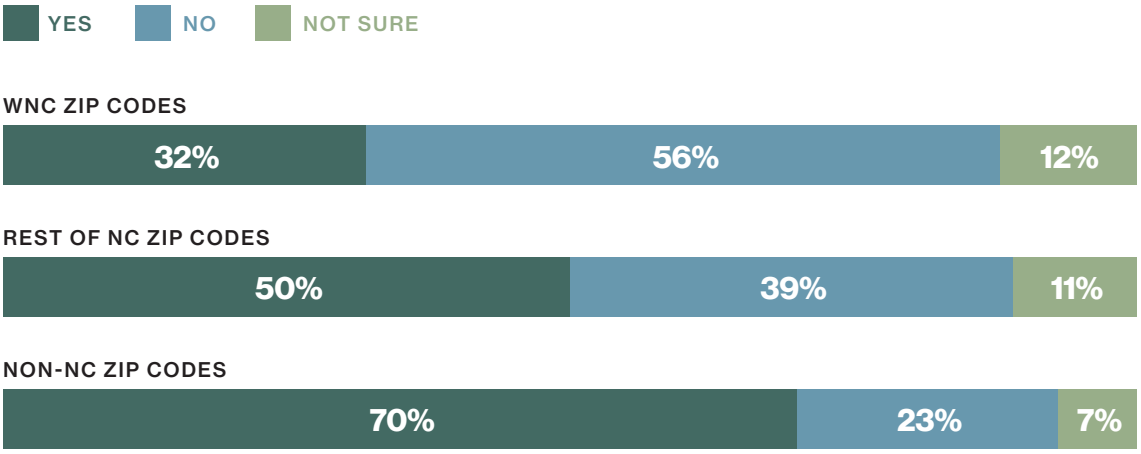
Per the online survey available to the public, it was asked if eMTBs are compatible with the current volume of use, existing user types and social sustainability of the trail system at DSRF. At the time, it was an abstract concept with no actual trails or details provided.

Do you feel that eMTBs are compatible with the current volume of use, existing user types and social sustainability of the trail system at DSRF?

If you shared trails and roads with eMTB at DSRF, how would this change your frequency of visiting DSRF?

To understand local opinions on eMTB compatibility within the Forest online surveys asked participants to provide their home zip code. Results indicated that local trail users were overwhelmingly for keeping the status quo. The responses broken down by zip code are provided below:

Do you feel that eMTBs are compatible with the current volume of use, existing user types and social sustainability of the trail system at DSRF?



4.4.2 OTHER EMERGING RECREATIONAL DEVICES & TRENDS

Other electric uses such as one-wheel scooters, electric off-road skateboards, or similar are not recommended for any inclusion in the Forest's user matrix. While the technology behind these will continue to grow to make them more user-friendly and more robust, they do require very little input from their riders and have very few regulations as to their speeds. The potential consequences of strong social impacts should discourage their use.

Electric water sports equipment is also a growing segment of the water sports industry. Electric surfboards, electric hydrofoils, electric kickboards and electric underwater scooters are continuing to be developed and are a growing market. It is recommended that all lakes and rivers in the Forest remain non-motorized as the surface water area is finite and more difficult to spread users out.

Equestrian focus groups also discussed several big social impacts that revolve around emerging and existing technologies and trends and how they affect individual horses, mules and equestrians, as well as the greater trail community.

Drones

Drones are increasing in use around the nation's forests for both personal use and forest management. These new pieces of technology are very valuable in forest management applications but can also startle unacclimated animals and riders. If drones are going to be used for forestry applications, it is recommended that warning signs go up to alert riders that they could be encountered within the system.

eMTBs

As previously noted, the rise of eMTB use in the nation's forest is causing some concern among equestrians. As with all trail users, there are good users and careless users. Continue to create trail systems with opportunities for all users to have positive trail encounters, including good sightlines, traffic calming features, clear signage and clear trail management objectives.

Bells

Bells seem to be on the rise in trail systems. Both cyclists and runners use bells to alert other trail users to their presence. These bells are commonly thumb-actuated units, but they can also be small cowbells that constantly emit a ring. Either way, there is concern among equestrians that the use of these, while well intended, can scare horses and riders. It is often preferred that voice warnings be used instead. There are, however, some instances of parks and areas using bells with positive results:

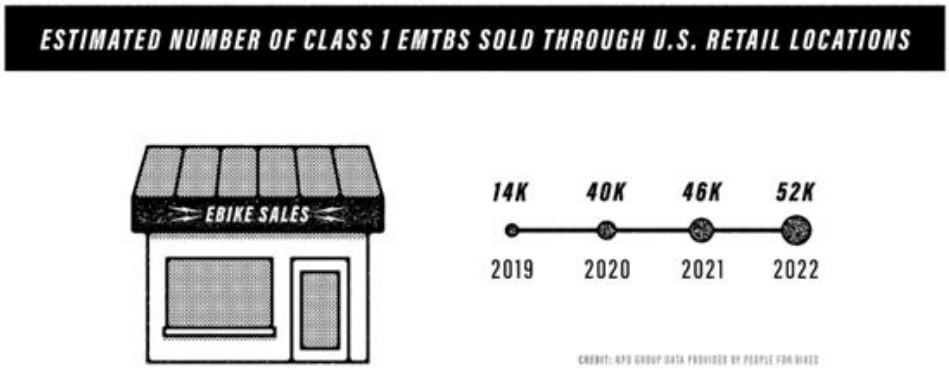
> *"In 2010, Central Coast Concerned Mountain Bikers (San Luis Obispo, CA) initiated its bell program at Montaña De Oro (MdO) State Park, to help address the issues surfacing because of greatly increased trail use. Trails at MdO have always been very popular multi-use trails with equestrians, hikers, trail runners and cyclists. As these trails became more popular, Central Coast Concerned Mountain Bikers decided to become proactive in addressing the growing potential for trail conflict. To protect open trails from closure and to encourage land managers to approve the creation of new mountain biking trails in the region, the Bells4Bikes Program was born.*
>
> *Feedback received from local hikers and equestrians has been very positive and they are supportive of this program. Generally speaking, humans hear the bells a few hundred yards away; horses can hear them from a distance of a 1/4 mile or more."* [28]

Dogs

More and more dogs are visiting the Forest. DSRF has a leash law in effect, but barking and lunging dogs can spook horses causing unintended accidents. Off-lease dogs pose an even greater problem for horses and while these are technically illegal in DSRF there are instances where horses encounter free-roaming dogs. Continued education and enforcement around the leash laws and the reason behind them will help keep these unwanted encounters to a minimum.

4.4.3 RECREATIONAL TRENDS RECOMMENDATIONS

It is recommended that no change be made to the management of eMTBs in DSRF. eMTBs are currently allowed on perimeter roads only. This recommendation is based on both public feedback and the necessary legislative action required to allow eMTBs on state forest lands. In addition, allowing eMTBs at this point could lead to the public wanting further separation of trail uses leading to a further divided trail system.



https://freehub.com/features/electric-slide[29]

Please note that Other Power-Driven Mobility Devices (OPDMDs) are distinguished from eMTBs and as such are covered under the Americans with Disabilities Act (ADA) Requirements which is a federal statute and supersedes NC State Forest law. It is recommended that DSRF provide public information or signage defining OPDMDs versus eMTBs and provide signage and information about the ADA requirements:

> *"People with mobility, circulatory, respiratory, or neurological disabilities use many kinds of devices for mobility. Some use walkers, canes, crutches, or braces. Some use manual or power wheelchairs or electric scooters. In addition, advances in technology have given rise to new devices, such as Segways, that some people with disabilities use as mobility devices, including many veterans injured while serving in the military. And more advanced devices will inevitably be invented, providing more mobility options for people with disabilities.*
>
> *Covered entities (title II entities – State and local governments) must allow people with disabilities who use manual or power wheelchairs or scooters and manually-powered mobility aids such as walkers, crutches and canes, into all areas where members of the public are allowed to go.*
>
> *Covered entities must also allow people with disabilities who use other types of power-driven mobility devices into their facilities unless a particular type of device cannot be accommodated because of legitimate safety requirements. Where legitimate safety requirements bar accommodation for a particular type of device, the covered entity must provide the service it offers in alternate ways if possible."* [29]

Common concerns about eMTB traffic, provided during the Public Input events of this planning effort, centered around trail safety and the speed at which eMTB can go, potential impacts to trail conditions and potential environmental impacts.

Next Steps

It is recommended that there be no change to the current status quo of the Forest's regulation of eMTBs. In order to achieve success in managing the existing regulations regarding eMTBs in DSRF, the following strategies are recommended:

Expand Education & Outreach

- Increase education and outreach programming that highlights eMTB-related messaging.
- Include explanations of potential negative experiences for other users.
- Emphasize the unique user profile and trail system at DSRF.

Enhance Rule Enforcement

- Maintain a consistent strategy for enforcing eMTB rules.
- Adjust communication efforts according to seasonal user patterns and seasonal user volumes.
- Target regional and extra-regional users who may be less familiar with DSRF's rules.

Collaborate with Partners

- Work with non-profits like Friends of DuPont Forest and tourism authorities.
- Share eMTB talking points and develop new outreach materials.
- Distribute information to local community stakeholders.

Engage with Elected Officials

- Keep local and state officials informed about DSRF's trail users and the impact of eMTBs.
- Monitor potential new legislation concerning eMTBs.

Monitor and Document Trends

- Track eMTB violations and OPDMD interactions to identify trends.
- Consider increasing personnel resources if eMTB use and enforcement needs arise.

Public Input

5 Public Input

The public input was guided by the DuPont State Recreational Forest (DSRF) Team and the planning team. The following terms were used for the duration of the project.

TERM	REFERRING TO
Conservation	*Wise use of the Forest*
Consultant / Design/ Planning Team	*Mattern & Craig, Arcadis, C2 Recreation Consulting, Terra Incognito*
DSRF	*DuPont State Recreational Forest*
Focus Groups (4) most visible user groups	*Hunters / Anglers* *Equestrians* *Hikers* *Mountain Bikers*
Passport	*The handout to all Public Input Drop-In participants*
PIDI Public Input Drop-In	*Public Workshops / Public Meetings / Public Sessions*
Stakeholder Group	*DSRF Advisory Committee + Members*
Users	*Visitors to DSRF*

5.1 User Survey Feedback

From April through mid-September 2023, public surveys were posted online and administered in various access area parking lots to collect public feedback for DSRF and the Recreation Master Plan. Online surveys were conducted to gather feedback from a wider audience. Parking lot surveys were conducted to gain feedback from users of the Forest at the time of their visit. The responses were then analyzed to assess user preferences, concerns and suggestions related to ecological, social and economic sustainability. Parking Lot surveys were given to engage with visitors on-site and collect information on user experiences, trail usage patterns and areas of improvement. The surveys asked participants about existing trails, recreation infrastructure and their recreational activities. The surveys also asked questions regarding Forest operations, user experience and ecological values. Collectively, 3,679 responses were received with 3,515 of those responses received from online surveys and 164 received from parking lot surveys. The following is a list of major survey findings.

Ecological Input

The DSRF survey results give insight into the user priorities regarding Forest objectives and how these priorities can be addressed through planning, programming and prioritization in future DSRF planning efforts.

Benefits

DSRF offers many different ecological, social, economic and recreational opportunities. Survey participants ranked seven of the benefits the Forest provides, with the number one benefit being the statement most frequently selected as most important:

1. Recreational opportunities.
2. Protection of habitat and natural areas.
3. Natural beauty of rivers, waterfalls and forested areas.
4. Education and research opportunities.
5. Solitude in a natural setting.
6. Providing sustainable sources of forest products through forest management practices.
7. Access to areas for hunting and fishing.

Objectives

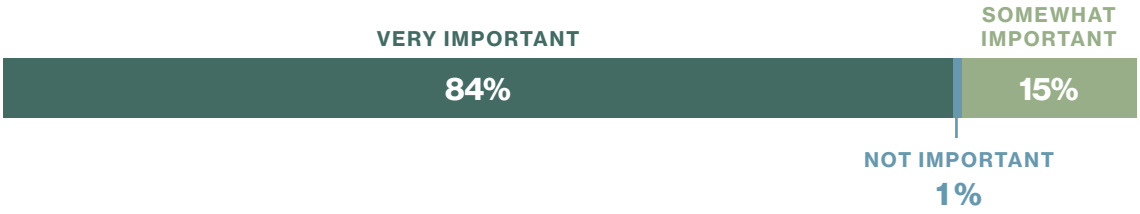
DSRF focuses on environmental sustainability as a primary objective of the State Forest's mission. Participants provided input on what they believed the three highest natural resource priorities for the Forest to be:

- Reduce erosion and deposition into streams and rivers.
- Improve wildlife habitat for game and non-game species.
- Protect native plants and animal species.

ECOLOGICAL INTEGRITY & CHARACTER

Responses to the surveys determined that most users believed that it was very important to protect the ecological integrity and character of DSRF's natural communities (84%), while small groups believed it was somewhat important (15%) or not important (1%).

How Important is it to you to protect the ecological integrity & character of DSRF's Natural Communities?



CONCERNS—RECREATIONAL IMPACTS

More than half of the participants (54%) stated that they have concerns about the impact of recreational use on the long-term ecological sustainability of DSRF. Most of the participants voted that they would be supportive of some level of change to the recreational trail system to support or protect ecological values. Participants who answered were given the choice between very supportive (40%), somewhat supportive (42%), not supportive (11%) and no opinion (7%).

With these results in mind, the DSRF Master Plan will provide recreational, facility and management recommendations that aim to positively affect the Forest's ecological sustainability.

Do you have concerns about the impact of recreational use on the long-term ecological sustainability of DSRF?

How supportive would you be of some level of change to the recreational trail system to support or protect ecological values?

Social, Managerial & Economic Input

Challenges

DSRF faces several challenges when it comes to maintaining and managing its recreational trails. Survey participants were asked to rank the top five challenges, with one being the highest priority. Below are the results from the online and parking lot survey:

1. Routine maintenance and repairs.
2. Funding for maintenance and repairs.
3. Severe degradation requiring extended closures and a massive overhaul of trails.
4. Lack of other resources for maintenance and repairs.
5. Enforcement of behavior and monitoring recreational uses.

CONCERNS—MAINTENANCE CAPABILITIES

With these challenges in mind, survey participants responded to whether they believed DSRF can maintain trails and recreational systems at their current level of use. Most participants indicated that they were somewhat concerned (51%) about DSRF's ability to maintain trails and recreational systems at their current levels of use. The remaining participants stated that they are very concerned (31%) or not concerned (18%) about the DRSF's ability to maintain trails and recreational systems.

How concerned are you about the ability of DSRF to maintain trails and recreational systems at their current level of use?

RECREATIONAL USER PREFERENCES

The DSRF surveys used this community engagement opportunity to gather information about the standard preferences of Forest users. From the responses it was determined that the top three user groups were mountain bikers (51%), hikers/walkers/trail runners (21%) and equestrians (15%).

However, it is important to note that observations within the Forest show that hikers/walkers/trail runners make up the largest user group and represent a high percentage of visitors especially in the waterfall corridor. Most participants stated that they utilize the Forest during the morning hours and most visited on Friday, Saturday and Sunday. A large majority of participants traveled less than an hour to visit the Forest and most regularly carpooled with two or three people when they visited the Forest. Most participants answered that they encountered somewhere between six to twenty users while within the Forest boundary. Participants indicated that they would prefer occasional opportunities for solitude and less crowded recreational experiences. In addition, a large group responded that the experience of solitude is very important to their desired experience within DSRF.

To identify high-use access points and points of interest within the Forest, participants were asked to name their most visited access points and points of interest. The survey results indicated that most users frequent the Lake Imaging, Guion Farms and Corn Mill Shoals access areas. The top three points of interest were indicated as the trail system, Triple Falls and High Falls.

MOST VISITED ACCESS POINTS		TOP 3 POINTS OF INTEREST
Lake Imaging	1	The Trail System
Guion Farms	2	Triple Falls
Corn Mill Shoals	3	High Falls

Participants also ranked the top five factors that most affect their experience when visiting the Forest. The survey results determined the top five factors as:

TOP 5 FACTORS AFFECTING VISITOR EXPERIENCE	
1	Ease of access to desired use or point of interest.
2	Opportunities to experience desired use or activity.
3	Condition of trails supporting desired use.
4	Other visitors' behavior such as courtesy or risk-taking behavior.
5	Trash and litter in the forest.

The information collected in relation to user preference gave the planning team a better understanding of user priorities, giving them a baseline of how users utilize and view the Forest.

FOREST INFORMATION

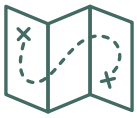
Participants were also asked to provide information on how they routinely acquire Forest information for their visits. Most of the participants stated that they received Forest information by word of mouth; however, social media and the DSRF website were also standard ways to get information prior to visiting the Forest. In addition, most participants stated that they typically use digital applications (apps), their past experiences, or physical maps to find their way through the Forest.

WORD OF MOUTH

SOCIAL MEDIA

DSRF WEBSITE

MAP APPS



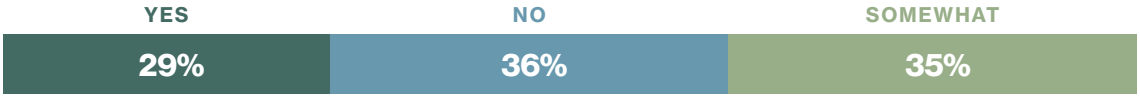
PRINTED MAPS

FUTURE RECREATIONAL OPPORTUNITIES

New Properties

Recently, DSRF gained two new properties which allows for the potential of future recreational opportunities. Survey participants were asked for their opinion on DSRF's ability to take on additional maintenance and management of these new properties if additional recreational activities were provided in these areas. Participants were almost evenly split on their opinions of feeling that there could be somewhat (35%) or no (36%) strain on DSRF's management and maintenance practices if the Forest began to focus on new property access, recreation development and connections to regional trails. The remaining participants believed that there would be a strain on management and maintenance practices of the Forest if they focused on new property, recreation development and connections to regional trails (29%). Although there is concern about the strain these new properties could place on DSRF, participants stated that they would like easier access to canoeing/paddle boarding/kayaking (49%), swimming (25%), picnicking (19%) and pier fishing (7%).

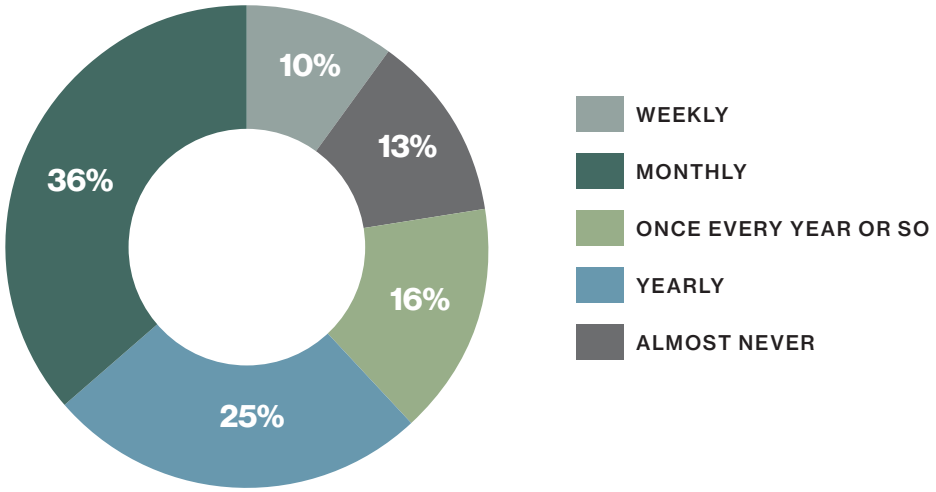
Do you feel that a focus on new property access & recreation development, as well as connections to regional trails, could strain the current management & maintenance practices on the state forest?



Which of the following activities, currently offered within DSRF, would you like to see easier access to? (Select one)

Regional Trails

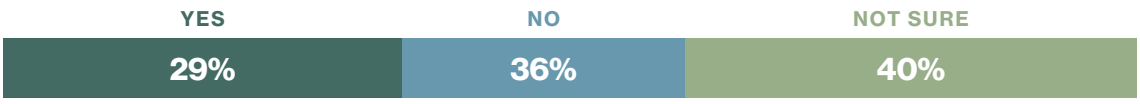
Regional trails within the area offer opportunities for connectivity to the Forest trail system. When asked about a future connection to one of these regional trails, participants provided the following feedback: Participants stated that the majority (36%) would use regional trails connected to DSRF monthly. Others stated they would use these trails either weekly (10%), yearly (25%), once of year or so (16%) or almost never (13%). Of the five surrounding regional trails survey participants stated that they would like to see The Ecusta Trail (38%), The Mountains to Sea Trail (22%), The Foothills Trails from South Carolina (18%), The Palmetto Trail from South Carolina (14%), or The French Broad Paddle Trail (8%) connected to DSRF.



ACCESSIBILITY

Regarding ADA accessibility most survey participants (40%) stated that they were unsure if DSRF offers adequate facilities and outdoor recreation opportunities for visitors with limited mobility, impairment, or disability covered by the Americans with Disabilities Act of 1990. Other participants (35%) stated that they believed DSRF does offer adequate facilities and outdoor recreation opportunities for these visitors, while some responded (25%) that they did not believe these facilities and opportunities were offered by DSRF.

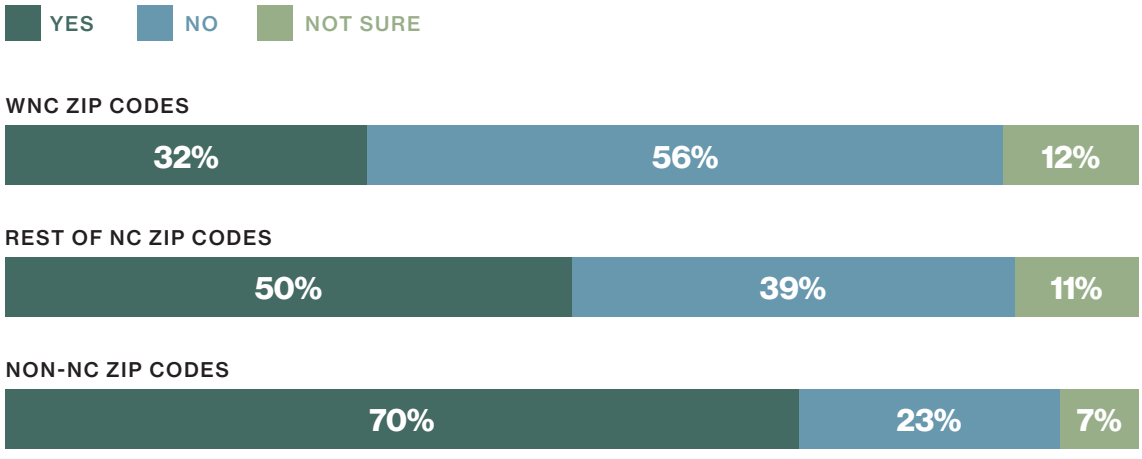
Do you feel DSRF offers adequate facilities & outdoor recreation opportunities for visitors with limited mobility & visitors with an impairment or disability covered by the Americans with Disabilities Act of 1990?



TRENDS—ELECTRONIC MOUNTAIN BIKES

The emergence of electronic mountain bikes (eMTBs) has begun to impact DSRF. Users have mixed reactions regarding this new evolution of bikes and their place within the Forest. The surveys indicated that the two largest groups consisted of participants who believed eMTBs are not compatible (46%) and are compatible (42%) with the current volume of use, existing user groups and social sustainability of the trail system within DSRF. The remaining percentage of participants (12%) were unsure if eMTBs were compatible. With the current state of the Forest and trail systems, most participants (41%) stated that they believe that "no change" needed to be made to accommodate for eMTB, while the second largest group of participants (30%) stated that they believe eMTBs should only be allowed on wider gravel road settings. Participants were asked if eMTBs were allowed within the Forest, would their presence affect visitation patterns. The majority stated that it would not change how often they visited the Forest (44%). The second largest group of participants stated that they would visit more if e-bikes were allowed (24%). Some stated they would visit less (23%), and others stated they would stop visiting DSRF altogether (9%). To distinguish the results further, the planning team broke down the responses into Western North Carolina zip codes, state-wide zip codes and out-of-state zip codes. This breakdown enabled the planning team to better understand the local opinions because local visitations made up a large portion of the recorded visitation to the Forest. The results showed that those living in Western North Carolina believed eMTBs are not compatible (56%), not sure if eMTBs are compatible (12%) and believed eMTBs are compatible with the Forest (32%). Statewide results showed that participants believed eMTBs are not compatible (39%), not sure if eMTBs are compatible (11%) and believed eMTBs are compatible with the Forest (50%). For those outside of North Carolina, the results showed that these participants believed eMTBs are not compatible (23%), not sure if eMTBs are compatible (7%) and believed eMTBs are compatible with the Forest (70%).

Do you feel E-bikes are compatible with DSRF's current trail system?



TRAILS

Multi-Use

DSRF consists of 74 trails and roads, most of which are designated as multi-use. The online survey revealed that most survey participants felt that the multi-use trail system works well, although there are some occasional issues (57%). Other survey participants felt that the system works well (32%), and a small portion felt that it does not work well (11%).

Preference

With so many visitors using the trail system at DSRF, it is necessary to determine which factors will maintain a positive user experience and allow for the sustainable longevity of the trail network. Participants were asked to rank trail characteristics that would most impact their experience with one being the highest priority.

5 FACTORS THAT MOST AFFECT EXPERIENCE	
1	Trail design (surface, width & slope)
2	Trail courtesy
3	Trail connectivity (opportunities for well-connected trail choices)
4	Multi-directional path of travel
5	Shared trails
6	Number of trail users

Support for Change

Conflicts or safety concerns occasionally occur with several user groups using the same trails within the Forest. The DSRF survey asked participants to state if they would support some trails being designated for specific uses to avoid potential conflicts. The responses indicated that the majority would support a mix of specific trail use designation and shared use trails (54%) while others stated that they would support specific trail use designation on most trails (24%) or were not supportive of designation and wanted the Forest to maintain the current multi-use shared trail system (22%).

Most survey participants also stated that they would be supportive of trail segment closures or reroutes to support improvements such as a more cohesive trail system, greater long-term sustainability and less environmental damage (81%). Smaller groups said that they either would not be supportive of these changes (9%) or had no opinion on the matter (10%).

With these results in mind, the DSRF Master Plan will provide recreational, facility and management recommendations that aim to positively affect the Forest and its mission.

5.2 Public Input Drop-In Session (PIDI) Feedback

On May 8th, July 24th and November 4th, 2023, Public Input Drop-Ins (PIDIs) were held in Hendersonville, Brevard and Pisgah Forest; all located within reasonable proximity to DSRF. 477 users participated in the drop-ins and focus group discussions. At the drop-ins, the planning team provided additional information, answered participant questions and directed focus group discussions. The boards created for these events provided contextual information about the Forest, project schedule and milestones, and asked a series of questions to gather more detailed information related to ecological, social and economic sustainability from participants.

Responses to questions were recorded on dot boards, passports, maps and sticky notes. When they arrived, participants were given a predetermined number of adhesive stickers and a passport pamphlet. Using the stickers provided, participants were able to indicate preferences on several items. The passports allowed participants to respond to additional questions and add comments about the information presented during the session. The participants also had the opportunity to comment on a series of maps detailing current and proposed items within the Forest. This exercise allowed the participants to interact with other members of the public and review and comment on notes left by other participants. The input boards for each public input drop-in evolved from the previous session, which allowed for more detailed information to be gathered from the public. Please note that at the time of the public input process Briery Fork Trail was a separate trial and had not yet been absorbed into Turkey Knob Trail. The absorption of Briery Fork Trail was conducted by DSRF and occurred after the second PIDI was concluded. Answers and vote totals provided for each public input question are on the following pages.

PIDI #1

QUESTION	ANSWER	VOTES
1 What do you understand to be the most significant challenges to maintaining & managing recreational trails & infrastructure? (Select one)	Routine maintenance and repairs	74
	Severe degradation requiring extended closures and a massive overhaul of trails	15
	Funding for maintenance and repairs	62
	Lack of other resources for maintenance and repairs	5
	Enforcement of behavior and monitoring of recreational uses	68
	Other	3
2 How concerned are you about the ability of DSRF to maintain tails and recreational systems at their current level of use? (Select one)	Very concerned	119
	Somewhat concerned	50
	Not concerned	16
3 How important is it to you to protect the ecological integrity and character of DSRF's natural communities? (Select one)	Very important	186
	Somewhat important	20
	Not important	0
4 How supportive would you be of some level of change to the recreational trail system to support ecological values and protect sensitive habitats? (Select one)	Very supportive	101
	Somewhat supportive	93
	Not supportive	9

QUESTION	ANSWER	VOTES
5 Would you be supportive of trail segment closures or reroutes to support improvements such as a more cohesive trail system, greater long-term sustainability & less environmental damage? (Select one)	Yes	173
	No	18
	No Opinion	5
6 Choose the most important benefit to society that DSRF provides. (Select one)	Providing a sustainable source of forest products through forest management practices	5
	Protection of habitat and natural areas	42
	Education and research opportunities	3
	Solitude in a natural setting	9
	Recreational opportunities	117
	Natural beauty of rivers, waterfalls and forests	28
	Access to areas for hunting and fishing	9
7 How well do you feel a multiple-use trail system is working in DSRF? (Select one)	Works very well; few issues	51
	Seems to work well; some occasional issues	145
	Does not work well; frequent issues	22
8 How supportive would you be of some trails being designated for certain uses? (Select one)	Supportive of specific trail use designation on most trails	22
	Supportive of a mix of specific and shared use trails	108
	Not supportive, maintain current multiple-use shared trail system	86
9 Which of the following points of interest do you most frequently visit? (Select one)	None, just enjoy nature	4
	Interconnected trail system (162)	162
	Lake Dense	4
	Lake Julia	4
	Lake Imaging	7
	Fawn Lake	6
	Bridal Veil Falls	4
	Grassy Creek Falls	0
	High Falls	0
	Hooker Falls	0
	Triple Falls	2
	Wintergreen Falls	4
	Other	26

PIDI #1

QUESTION	ANSWER	VOTES
10 Which access area do you typically use to enjoy DSRF? (Select one)	Corn Mill Shoals Access Area	24
	High Falls Access Area	3
	Hooker Falls Access Area	7
	Lake Imaging Access Area	44
	Guion Farm Access Area	83
	Fawn Lake Access Area	23
	Other	34
11 Trails & Roads: Select the trail or trails you most frequently visit. Please select your top five from the list of 69 trails.	Airstrip Trail	37
	Barn Trail	2
	Big Rock Trail	39
	Boundary Trail	2
	Bridal Overlook Trail	4
	Bridal Veil Falls Road	10
	Briery Fork Trail	30
	Buck Forest Road	24
	Burnt Mountain Trail	27
	Camp Summit Road	2
	Cart Trail	8
	Cascade Loop	13
	Cedar Rock Trail	28
	Conservation Road	12
	Corn Mill Shoals Trail	31
	Covered Bridge Trail	11
	Farmhouse Trail	4
	Fawn Lake Loop	18
	Fawn Lake Road	24
	Flat Rock Trail	1
	Flatwoods Trail	2
	Frank Street	0
	Grassy Creek Falls Trail	11
	Grassy Creek Trail	19
	Grassy Meadow Trail	1
	Hickory Mountain Road	4
	Hickory Mountain Trail	53
	High Falls Loop	24
	Hilltop Trail	36
	Holly Road	2
	Hooker Creek Trail	35

PIDI #1

QUESTION	ANSWER	VOTES
	Hooker Falls Trail	18
	Isaac Heath Trail	36
	Jim Branch Trail	106
	Joanna Road	7
	Lake Imaging Road	277
	Lake Julia Road	8
	Lake View Loop	0
	Laurel Ridge Trail	9
	Little River Trail	5
	Longside Trail	10
	Micajah Trail	14
	Mine Mountain Trail	24
	Nooks Trail	0
	Plantation Trail	2
	Poplar Hill Trail	3
	Reasonover Creek Trail	64
	Ridgeline Trail	95
	Rifle Trail	14
	Rock Quarry Road	14
	Rocky Ridge Trail	41
	Ruffed Grouse Trail	11
	Sandy Trail	10
	Sheep Mountain Road	6
	Shelter Rock Trail	1
	Shoal Creek Trail	26
	Shoals Trail	2
	Stone Mountain Trail	7
	Switchback Trail	6
	Table Rock Trail	0
	Tarkin Branch Road	14
	Thomas Cemetery Road	60
	Three Lakes Trail	32
	Triple Falls Trail	8
	Turkey Knob Trail	62
	Twin Oaks Trail	4
	Twixt Trail	2
	Wilkie Trail	106
	Wintergreen Falls Trail	27

PIDI #2

QUESTION	ANSWER	VOTES
1 What do you understand to be the most significant challenges to maintaining and managing recreational trails and infrastructure? (Select one)	Routine maintenance and repairs	118
	Severe degradation requiring extended closures and a massive overhaul of trails	26
	Funding for maintenance and repairs	102
	Lack of other resources for maintenance and repairs	9
	Enforcement of behavior and monitoring of recreational uses	80
	Other	2
2 How concerned are you about the ability of DSRF to maintain trails and recreational systems at their current level of use?	Very concerned	171
	Somewhat concerned	111
	Not concerned	21
3 How important is it to you to protect the ecological integrity and character of DSRF's natural communities?	Very important	283
	Somewhat important	73
	Not important	0
4 How supportive would you be of some level of change to the recreational trail system to support ecological values and protect sensitive habitats?	Very supportive	164
	Somewhat supportive	126
	Not supportive	10
5 Would you be supportive of trail segment closures or reroutes to support improvements such as a more cohesive trail system, greater long-term sustainability and less environmental damage?	Yes	265
	No	22
	No opinion	2
6 Choose the most important benefit to society that DSRF provides. (Select one)	Providing a sustainable source of forest products through forest management practices	6
	Protection of habitat and natural areas	68
	Education and research opportunities	9
	Solitude in a natural setting	13
	Recreational opportunities	160
	Natural beauty of rivers, waterfalls and forests	57
	Access to areas for hunting and fishing	11
7 How well do you feel a multiple-use trail system is working in DSRF?	Works very well; few issues	68
	Seems to work well; some occasional issues	214
	Does not work well; frequent issues	29

QUESTION	ANSWER	VOTES
8 How supportive would you be of some trails being designated for certain uses?	Supportive of specific trail use designation on most trails	31
	Supportive of a mix of specific and shared use trails	188
	Not supportive, maintain current multiple-use shared trail system	102
9 Which of the following points of interest do you most frequently visit? (Select one)	None, just enjoy nature	7
	Interconnected trail system	248
	Lake Dense	4
	Lake Julia	7
	Lake Imaging	11
	Fawn Lake	7
	Bridal Veil Falls	6
	Grassy Creek Falls	1
	High Falls	3
	Hooker Falls	6
	Triple Falls	6
	Wintergreen Falls	4
	Other	25
10 Which access area do you typically use to enjoy DSRF? (Select one)	Corn Mill Shoals Access Area	37
	High Falls Access Area	13
	Hooker Falls Access Area	16
	Lake Imaging Access Area	71
	Guion Farm Access Area	122
	Fawn Lake Access Area	32
	Other	44
11 Do you feel that e-bikes are compatible with the current volume of use, existing user types and social sustainability of the trail system at DSRF?	Yes	20
	No	63
	Not sure	24
12 If e-bikes are allowed within DSRF, what changes should be made to accommodate their use?	No changes. I feel e-bikes and pedal-assist bicycles are compatible with DSRF's current trail and road design.	12
	E-bikes and pedal-assist allowed only on wider gravel road settings.	53
	E-bikes and pedal-assist allowed only on future trails designed and managed primarily for bicycle users.	15

PIDI #2

QUESTION	ANSWER	VOTES
13 If you shared trails and roads with e-bikes at DSRF, how would this change your frequency of visiting DSRF?	I would stop visiting	7
	I would visit less	18
	I would not change how often I visit	69
	I would visit more	7
14 Do you feel DSRF offers adequate facilities and outdoor recreation opportunities for visitors with limited mobility and visitors with an impairment or disability covered by the Americans with disabilities act of 1990?	Yes	8
	Somewhat	50
	No	23
15 Which of the following activities currently offered within DSRF, would you like to have easier access to? (Select one)	Swimming	26
	Picnicking	13
	Canoeing / Paddle Boarding / Kayaking	36
	Dock or Bank Fishing	6
16 How important is it to you to have more opportunities for solitude and less crowded recreational experiences?	High – very important	23
	Moderate – sometimes but not always	67
	Low – not important	10
17 Do you feel that a focus on new property access and recreation development as well as connections to regional trails could strain the current management and maintenance practices on the State Forest?	Yes	5
	Somewhat	56
	No	25
18 How many times a year would you use a regional trail that connected to DSRF?	Almost never	6
	Once every year or so	3
	Yearly	19
	Monthly	47
	Weekly	16
19 Which regional trails or natural areas would you like to see connected to DSRF? (Select all that apply)	The Palmetto Trail from South Carolina	19
	The Mountains-to-Sea Trail	6
	The French Broad Paddle Trail	8
	The Ecusta Trail	73
	The Foothills Trail from South Carolina	19

Public Input Drop-In #1 at the Transylvania County Library in Brevard, NC, May 8, 2023

Public Input Drop-In #2 at the Kaplan Auditorium at the Henderson County Public Library in Hendersonville, NC, July 24, 2023

QUESTION	ANSWER	VOTES
20 Trails & Roads: Select the trail or trails you most frequently visit. Please select your top five from the list of 69 trails.	Buck Forest Road	24
	Burnt Mountain Trail	27
	Camp Summit Road	2
	Cart Trail	8
	Cascade Loop	13
	Cedar Rock Trail	28
	Conservation Road	12
	Corn Mill Shoals Trail	31
	Covered Bridge Trail	11
	Farmhouse Trail	4
	Fawn Lake Loop	18
	Fawn Lake Road	24
	Flat Rock Trail	1
	Flatwoods Trail	2
	Frank Street	0
	Grassy Creek Falls Trail	11
	Grassy Creek Trail	19
	Grassy Meadow Trail	1
	Hickory Mountain Road	4
	Hickory Mountain Trail	53
	High Falls Loop	24
	Hilltop Trail	36
	Holly Road	2
	Hooker Creek Trail	35
	Hooker Falls Trail	18
	Isaac Heath Trail	36
	Jim Branch Trail	106
	Joanna Road	7
	Lake Imaging Road	277
	Lake Julia Road	8
	Lake View Loop	0
	Laurel Ridge Trail	9
	Little River Trail	5
	Longside Trail	10
	Micajah Trail	14
	Mine Mountain Trail	24

QUESTION	ANSWER	VOTES
20 (Continued)	Nooks Trail	0
	Plantation Trail	2
	Poplar Hill Trail	3
	Reasonover Creek Trail	64
	Ridgeline Trail	95
	Rifle Trail	14
	Rock Quarry Road	14
	Rocky Ridge Trail	41
	Ruffed Grouse Trail	11
	Sandy Trail	10
	Sheep Mountain Road	6
	Shelter Rock Trail	1
	Shoal Creek Trail	26
	Shoals Trail	2
	Stone Mountain Trail	7
	Switchback Trail	6
	Table Rock Trail	0
	Tarkin Branch Road	14
	Thomas Cemetery Road	60
	Three Lakes Trail	32
	Triple Falls Trail	8
	Turkey Knob Trail	62
	Twin Oaks Trail	4
	Twixt Trail	2
	Wilkie Trail	106
	Wintergreen Falls Trail	27

Public Input Drop-In #3 at the Transylvania County Parks and Recreation Gym in Brevard, NC, November 4, 2023

PIDI #3

	QUESTION	ANSWER	VOTES
1	To support or protect ecological value, which of the following examples of levels of change would you support? (Select one)	Minimal Level of Change (conceptual)	52
		Some Level of Change (conceptual)	13
		More Level of Change (conceptual)	5
		Most Level of Change (conceptual)	49
2	For a better user experience and improved ecological and trail sustainability, which of the following examples of levels of change would you support? (Select one)	Minimal Level of Change (conceptual)	58
		Some Level of Change (conceptual)	8
		More Level of Change (conceptual)	20
		Most Level of Change (conceptual)	33
3	For a better user experience, which of the following examples of level of change would you support? (Select one)	Minimal Level of Change (conceptual)	77
		Some Level of Change (conceptual)	5
		More Level of Change (conceptual)	14
		Most Level of Change (conceptual)	42

Public Input Drop-In #4 at the Glenn Marlow Elementary School Gym in Mills River, NC, April 6, 2024

5.3 Focus Groups & Stakeholder Advisory Committee Feedback

At each of the three PIDI sessions, the planning team conducted focus group interviews with representatives from the four traditional user groups. These groups represented equestrians, mountain bikers, hikers and trail runners and hunters/anglers. These groups were each asked the same series of questions that were prepared for each input session. The responses from each focus group were recorded and there was a large amount of overlap between comments and opinions of the four user groups. In addition, throughout the planning process, the planning team met with a stakeholder group known as the Stakeholder Advisory Committee four separate times to discuss the current findings, recommendations and receive feedback and concerns. The Stakeholder Advisory Committee was made up of representatives from local organizations and groups who are uniquely tied to DSRF. The committee assisted with the planning process by providing additional feedback, insights and recommendations. From both the focus groups and the Stakeholder Advisory Committee, the planning team noted the following direct comments as being representative of the groups' opinions and concerns:

- Conservation is a high priority. Protect wildlife and habitats.
- Keep the Forest as natural as possible.
- Few negative user interactions.
- Loop trails are preferred.
- DSRF is a fun location to visit due to the options and variety of trails available.
- Most users are willing to pay entrance fees to assist with maintenance funding concerns.
- The Forest gets busy at certain times and on certain days.
- Maintain public access to DSRF.
- Can there be a limit on the number of trail-guided tours occurring within the Forest?
- Crowded trailhead and parking areas.
- The biggest challenge is educating users.
- Improve awareness of "Forest Rules".
- Provide education to enhance safety and visitor awareness.
- Improve signage for safety zones for hunting areas.
- Encourage a "Leave No Trace' mentality".
- Provide signage regarding dogs (i.e. "Keep dogs on leash"). Dogs off leash can cause dangerous interactions.
- Users need to use common courtesy.
- Visit preparedness (i.e. "There is no potable water in DSRF").
- Apps provide information but do not educate users on trail etiquette.
- Respectful sharing of the trails.
- Concern about the high number of users.
- Concerned about hunting near Pinnacle Mountain side of the Forest.
- Address safety concerns at waterfalls.
- Good visibility on the trails is important. Blind curves can cause issues for all users.
- Single-track trails can cause dangerous user interactions.

- Users with earbuds or headphones can cause dangerous interactions.
- Animal feces on or near trails cause some issues.
- Trail maintenance needs increasing due to high levels of use.
- Encourage the enforcement of rules and regulations.
- Develop strategies to enhance “Good Behaviors”.
- Increase law enforcement. Is the enforcement of rules possible with such a large area and so many users? Seems like enforcement of rules is not practical. Education is key.
- Encourage visitors to stay on the trail (i.e. “Be in nature ON the trail”).
- Keep informal parking.
- Provide visitor center renovations.
- Increase community involvement.
- Monitor websites for posted messages.
- Could DSRF host events to promote community engagement and increase funding resources?
- Need more volunteers and need to provide volunteer education workshops.
- Hunters pay to use the Forest.
- Would like to prevent any loss of game lands.
- Green horses don’t do well with bikers. Most equestrians bring experienced horses to DSRF or take green horses to less populated areas.
- Gravel trails are bad for horses.
- Is bear hunting an option?
- Would like better access to waterfalls for fishing.
- Keep hunting as a recreational opportunity in the Forest even though the hunting population is decreasing.
- River access points would help prevent riverbank erosion areas.
- Rotate trail usage.
- Keep DSRF multi-use.
- Close non-permitted access points.
- Provide parking lot trash cans.
- Open to the idea of directional trails.
- Communicate the reasons for trail changes (direction, designation, closures, new & extended trails).
- New recreational trends such as eMTBs and hoverboards.
- Additional map signage.
- Some bridges need repair.
- Emergency phones at trailheads.
- New property access.
- Professional trail builders to assist with trail maintenance and trail building.

This information was incorporated into the analysis of the overall collection of public input in order to inform various recommendations of the Draft Plan.

Public Input Drop-In #1 Outdoorsmen/Angler Focus Group Interview, May 8, 2023

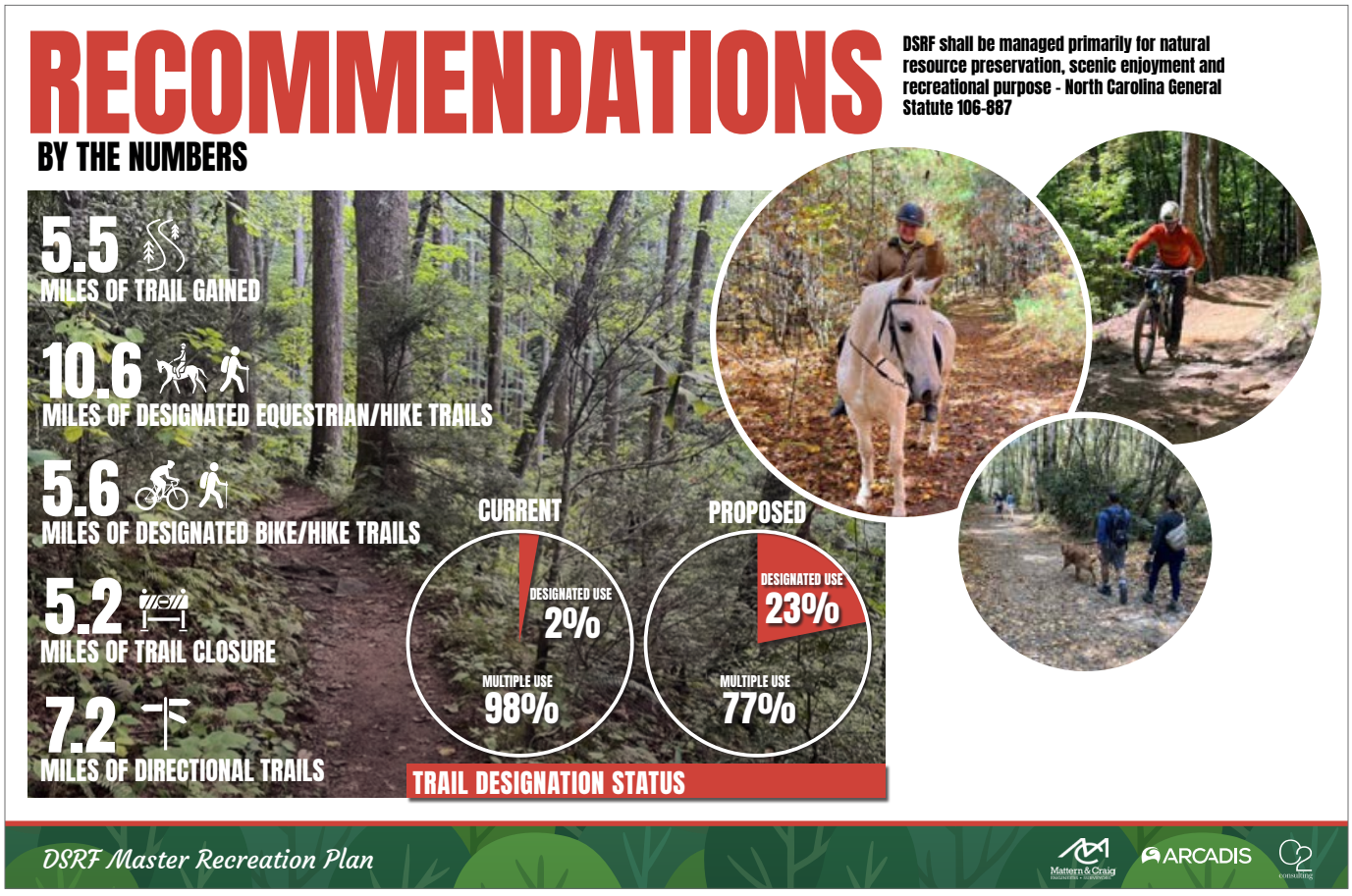
Public Input Drop-In #3 Equestrian Focus Group Interview, November 4, 2023

5.4 Draft Plan Feedback

The Draft Plan Meeting for the DuPont State Recreational Forest Master Recreation Plan was held on April 6, 2024. The planning team presented all the work completed to date, including, but not limited to, draft recommendations, select input results from previous public sessions, trend analysis, a Lake DERA conceptual plan with programming, trail network analysis and conceptual recommendations, conceptual opportunities for undeveloped properties and conceptual regional trail connections.

Discussions with the public and interactions with stakeholders at this meeting were primarily positive. Most users could see the larger picture of the plan and appreciated the level of sustainability it would provide for the Forest. Input and revisions from the meeting focused on information regarding Forest's trail system, electronic mountain bike recommendations, future additional amenities and recreational infrastructure, conceptual property usages and conceptual access to regional trails.

Throughout the public input process, the planning team gathered valuable insights to inform the sustainable development and management of DSRF while ensuring alignment with Forest objectives, user preferences and community priorities.



Public Input Drop-In #4: Recommendations by the Numbers Board

National Outdoor Recreational Trend Analysis

"Outdoor recreation participant base has grown significantly over the past three years...The COVID-19 pandemic spurred growth in 2020, and that growth continued through 2022. Over the past three years, the participant base expanded by 14.5 million participants (throughout the United States)."

- 2023 Outdoor Participation Trends Report

168 million = **55%**

AMERICANS PARTICIPATED IN OUTDOOR RECREATION SHOWING AN INCREASE OF 2.3% IN 2022

OF THE U.S. POPULATION OVER THE AGE OF 6

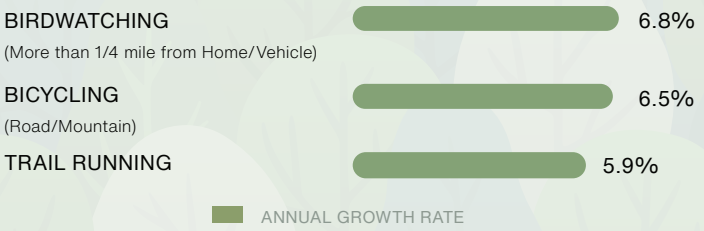
2022 TOP POPULAR ACTIVITIES
(OFFERED IN DSRF)

- HIKING
- RUNNING
- BICYCLING
- FISHING

2024 TOP EMERGING ACTIVITIES
(APPLICABLE TO DSRF)

- ADAPTIVE USE & E-BIKES
- RECREATIONAL TECHNOLOGY
  (GUIDED TOURS ON SMARTPHONES, EDUCATION EXPERIENCES (FLORA & FAUNA ID), PARK NAVIGATION, INTERACTIVE GAMES AND ACTIVITIES, & FITNESS EXERCISE APPS)
- INCLUSIVE & ACCESSIBLE SPACES
- SUSTAINABLE PRACTICES
  (ECOLOGICAL HEALTH, LONGEVITY + QUALITY OF TRAILS, MAINTAINING HISTORICAL SITES + PRACTICES, ETC.)

ANNUAL GROWTH RATE 2021 TO 2022



DSRF RECOMMENDATIONS

- DSRF will continue to promote and preserve high-quality experiences for traditional recreational groups such as **equestrians** and **hunting**.
- DSRF can expect to remain a high destination because of the variety of outdoor activities available and continued increases in **bicycling**.
- DSRF should adopt flexible management strategies to balance inclusivity of new trends with **sustainability**.

SOURCES

2023 Outdoor Participation Trends Report - Outdoor Foundation & Outdoor Industry Association

DSRF Master Recreation Plan

Mattern & Craig ENGINEERS + SURVEYORS | ARCADIS | O2 consulting

Public Input Drop-In #4: Recreational Trends Analysis Board

Needs Assessment

6 Needs Assessment

Stated simply, a state-owned Forest needs assessment is an analysis of existing facilities, operations and services and a comparison to standards and other metrics to determine current and future needs. Several methods were utilized during the planning process to assist DuPont State Recreational Forest (DSRF) to define future goals and formulate strategies to address needs. The first of these methods undertaken early in the process was an assessment of the existing conditions of the Forest's existing facilities and programs, existing trail network and current management, organization and policies ***(see Section 6.1)***. The second method was the use of metrics created by the planning team and DSRF staff to identify additional needs through several processes of national, regional and local research comparisons and the collection of public input information. The team researched and reviewed national, regional and local parks and Forests to create a comparison of the visits per acreage of protected land to better comprehend the high level of visits occurring in DSRF. Public input information was then collected to identify user concentration areas, user group statistics, needs and priorities and focus group and stakeholder group priorities. The final method collectively reviewed all information and research to prioritize the needs identified during the planning process and generate a timeline of when these items should be addressed by the Forest over the next fifteen years.

Other factors considered during the assessment included:

- Strengths and weaknesses
- Potential for expansion
- Natural and man-made features
- Natural resource and wildlife management objectives
- Protect species and other possible constraints
- Potential for consolidation of facilities
- Pedestrian and vehicular access and parking
- Pedestrian, bicycle and equestrian trail connections
- Passive vs. active land utilization
- Safety and security

6.1 Existing Conditions Assessment

The planning team visited the Forest in 2023 and assessed the physical conditions of the existing infrastructure and amenities. In addition, interviews were conducted with the public and DSRF staff to develop an assessment of current management and maintenance practices. Particular attention was given to observations that impact or could improve DSRF's environmental, social and economic sustainability. Some of the items noted included ADA access, wayfinding, areas of potential future recreational programming, information sharing, management and community and organizational relationships.

Another method for identifying needs is benchmarking, simply defined as a process to measure the quality of an organization's management strategies, standard practices, programs, etc. through their comparison to the standard or similar measurement of peer institutions. Several benchmarking exercises were conducted as part of the needs assessment that used the planning team's knowledge of other national, regional and local park and Forest facilities and programs. The first exercise focused on existing facilities and programs present within the Forest. This process weighed the attention placed on ADA compliance and opportunities, wayfinding, educational resources, safety and new properties. The second exercise focused on the assessment of the existing trail network and how trail management objectives, maintenance, practices and conditions could be improved. Lastly, the current management, organization and policies were reviewed through interview processes with DSRF staff and the public to identify the needs for current objectives, future recreational programming and facilities, emerging trends, social media, volunteers and funding opportunities.

6.1.1 EXISTING FACILITIES & PROGRAMS

Deferred Maintenance

The current trail network is in a state of distress, with about 74% of the trail system requiring both significant and frequent maintenance. Trail maintenance needs to be performed to ensure continued safe and positive user experiences as well as for the protection of sensitive natural resources that can be negatively affected by trail runoff. Some of this trail work can be addressed by volunteer trail crews; however, professional assistance is needed to expedite necessary maintenance and provide expertise in creating a durable infrastructure, ensuring a sustainable trail network. Primary focus should be placed on addressing safety issues in high-use zones such as the waterfall corridor which receives approximately one million visitations a year. Attending to maintenance concerns and implementing hardened infrastructure will also preserve the ecological integrity and character of the unique and protected habitats within the area. To better allocate funds, minimize staff efforts and greatly improve the Forest's sustainability, reinforced and sustainable trail maintenance and building practices must be put into place. Trail maintenance should be prioritized and addressed as a whole prior to starting any projects that focus on infrastructure expansion. Additional funds and staff are required to complete this necessary work ***(see Additional Staff and Diversify Funding Sources in Section 6.1.3—Current Management, Organization, & Policies).***

Americans with Disabilities Act (ADA) Opportunities

There are limited ADA-accessible areas within the Forest. Additional opportunities for those who benefit from ADA access are needed within the Forest boundary to provide opportunities for user engagement and increased user diversity in the Forest. Additional ADA signage and online information should be added to inform users of currently accessible areas and activities.

Upgrades to Existing Recreational Infrastructure

In comparison to popular national parks, DSRF needs to implement hardened infrastructure to ensure the health, safety and sustainability of the Forest. High-use areas like the waterfall corridor have trails that require large amounts of repair and have unsustainable alignments due to historical jeep roads. The current trails within the Forest are not constructed to appropriately handle heavy use, require constant maintenance due to poor alignment, and need to be upgraded to include strengthened infrastructure. The Forest needs to invest in this type of infrastructure throughout the property to ensure the long-term environmental, social and economic sustainability of the Forest. This investment will be costly. The Forest has been performing temporary or quick fixes to address these maintenance needs due to insufficient funds and staffing shortages. Staff are repeatedly having to address the same maintenance concerns. This utilizes the Forest's already limited funds and staff availability that could be better used for improvements and sustainability efforts. DSRF should increase annual capital investment for maintenance to protect the long-term sustainability of the Forest. To implement infrastructure that can handle elevated levels of Forest use, minimize staff efforts, improve visitor safety, provide long-term solutions and greatly improve the sustainability of the Forest, DSRF needs to prioritize the allocation of necessary funds to implement hardened sustainable infrastructure to all high-use zones.

Educational Material

Currently, DSRF has educational signage that focuses on items such as trail etiquette, appropriate visitor behavior and the Leave No Trace® principles. This signage is located at all access areas and some road and trail intersections. However, this signage needs to be more legible by increasing size or contrast. The Forest should take this a step further, by producing and posting additional educational material shared with the public either through social media channels or the Forest website. This information could also be disseminated by non-profit organizations who have standing relationships with the Forest or be taught in Forest-run workshops. The number of existing educational signage that focuses on environmental, social, cultural or historic assets within the Forest, needs to be assessed in balance with the staff's ability to maintain this signage. The Forest should consider replacing ineffective or redundant signs in certain areas with concise and targeted information. Improved signage will enhance the user experience, increase awareness of DSRF assets, gain support for Forest initiatives and increase user investment in the Forest as a whole.

Expansion of Existing Recreational Infrastructure

The Forest needs to reach a sustainable level of maintaining current infrastructure prior to the implementation of new or expanded infrastructure projects. In addition, the Forest must allocate appropriate funds and staff to properly undertake any Forest expansions.

Additional staff hired for the development of the below-mentioned three properties and potential regional trail connection will need to include staff for DSRF maintenance, recreational and law enforcement departments as well as seasonal staff to manage highly impacted areas. Recommendations include hiring four staff members for the Lake DERA expansion, two for the Cascade Lake and Continental Divide area expansions and one person for the regional trail connection points. Survey and public input drop-in participants indicated they are satisfied with the recreational opportunities currently offered within the Forest, however, there was an interest in adding more. The Forest would benefit from additional programs as they may improve user disbursement and bring some relief to high-use areas. The planning team identified these needs and opportunities and provided conceptual plans and programming for these potential recreational expansions to the existing DSRF infrastructure. These opportunities may be pursued once all current maintenance needs are addressed, funds are allocated for expansion projects and staffing is hired for each of the potential expansion areas.

6.1.2 EXISTING TRAIL NETWORK

Trail Management Objectives

New management objectives and strategies need to be implemented within DSRF to address high level of trail system use by several different user groups. Management objectives and strategies will assist the sustainability of the trail system, ecological health and positive user interactions. To create a more sustainable trail network, new management objectives and strategies must be identified and implemented. DSRF should carefully examine and execute how these new objectives and strategies are presented to the public needs to improve the likelihood of a positive reception from the community and successful implementation ***(see Section 4—Trails).***

Trail Maintenance & Management Practices

A significant percentage of DSRF trails require some form of maintenance. Ranking these trails can accurately determine a management strategy that results in greater trail sustainability. This ranking will help determine how to best use Forest funds. Continue using and expanding on volunteer groups to reveal which trail maintenance and trail building to perform to assist the Forest with the existing high maintenance needs.

Practices also need to be put in place by the Forest to increase the sustainability of the trail system. Current trail use by various groups is causing trail damage and degradation that could be lessened through practices such as designating trails for certain uses or directions, trail closures or trail additions. ***See Section 4—Trails*** for additional maintenance and management needs within DSRF.

Current Trail Conditions

During a thorough review process trails were assessed on the below criteria and assigned to one of four categories depicting their levels of maintenance frequency, trail sustainability and need for professional assistance. ***See Section 4—Trails*** to review detailed assessments for existing DSRF trails.

- Apparent use type and amount
- Difficulty level or dominant use difficulty Level
- Maintenance needs
- Experience reported and/or assessed
- Physical and social conditions
- Surface type
- Condition of tread
- General condition of drainage structures
- Washed out sections of trail (if notable)
- Signage assessment (quantity & placement)
- Condition of wet crossing
- Intersections (social & ecological assessment)
- Volunteer total maintenance hours (primary & secondary focus)
- DuPont staff mechanized assistance

6.1.3 CURRENT MANAGEMENT, ORGANIZATION & POLICIES

Additional Full-Time Staff

Currently, DSRF does not have an adequate number of recreation-focused personnel to maintain the trail network and implement any new improvements. In response to this staffing shortage, DSRF needs to hire at least two additional full-time staff to include a trails-based position and an equipment-based position. These positions will address the following needs of the DSRF trail network: compounding deferred maintenance, resource degradation, critical fixes for visitor safety and resource protection and eventually reach a place where the Forest can begin to look into the expansion of the current trail network and recreational infrastructure.

Natural Area Protection Efforts

The prominent level of Forest use is having negative impacts on its ecological, social and economic sustainability. There is a need to manage recreational activities to reduce negative outcomes on ecologically sensitive habitats throughout the Forest and continue natural area protection. The Forest must prioritize natural area protection and use this as a primary basis for current and future decision-making processes. DSRF should maintain this practice even when receiving high amounts of external pressure to ensure any future practices are environmentally sustainable.

System-Wide Maintenance and Additions

Due to the heavy use of the majority of trails, the Forest needs to focus on implementing maintenance repairs to the system as a whole to positively impact its sustainability. If a uniform approach to all trail maintenance is not implemented the Forest is less likely to have a successful transition to greater environmental, social and economic sustainability.

Emerging Trends

Electronic Mountain Bikes (eMTBs) were a topic of much discussion during the public input process. North Carolina State Forests do not allow the use of eMTBs within their properties. However, the use of Other Power-Driven Mobility Devices (OPDMD) is allowed by federal law regarding the Americans with Disabilities Act (ADA) Requirements. The confusion around these various recreational devices and the rules and regulations that apply to each was apparent during interactions with the public. DSRF needs to implement information-sharing strategies to inform users of the rules and regulations regarding eMTBs versus OPDMDs. To assist with enforcement efforts, this information could be disseminated with signage, volunteers or online content. By utilizing various approaches to share information and educational materials regarding these trends the Forest can better provide valuable information. The use of bells needs to be explored to gain a better understanding of potential recreational trends that may need to be addressed by the Forest in the future. In addition, the use of emerging trends such as drones and other technologies which are prohibited in the Forest due to user safety need to be more publicly addressed so that such items do not cause harm to any users.

Social Media

DSRF users need access to current information about trail closures due to rain, large visitation numbers and roadwork. The current process to relay this information to the public relies on the actions of state or tourist groups creating a lag time. The DSRF should utilize a more efficient process to better maintain positive user experience, user safety and trail sustainability. In addition, to information sharing on time-sensitive items, DSRF needs an online outlet to promote objectives such as environmental awareness, enhancing trail safety and awareness, increasing community involvement, driving event participation and supporting fundraising and donation efforts. By incorporating an online presence DSRF can ultimately promote responsible visitation, environmental conservation and a positive user experience. Due to current staff responsibilities, DSRF needs to hire a dedicated staff position to conduct social media management, public outreach, marketing efforts, permit applications and public engagement.

Volunteers

DSRF receives a large amount of support from Forest volunteers who perform services such as operating the visitor center, trail maintenance and trail construction. Volunteers provide several benefits for the Forest such as educational opportunities, a sense of ownership, public engagement and a reduction in maintenance costs. Since volunteers play such a significant role, it's important to ensure that all volunteers have access to the proper training and education to perform tasks efficiently, effectively and safely. Educated volunteers will have the required set of skills to assist with trail maintenance, however, trail maintenance should be categorized to ensure professional trail builders are utilized when required. The Forest's primary volunteer partner is Friends of DuPont Forest, who support and lead activities like invasive plant control, trail maintenance crews and trash collection events. The Forest needs to continue building this and other volunteer partnerships to expand their relationship network and form a larger volunteer base to assist with various Forest needs. There is also a need for online engagement in the form of a volunteer schedule that highlights monthly events or a sign-up portal to expedite the organization of volunteers for specific tasks.

Grants

DSRF needs to focus on grant allocation to secure funding to complete trail maintenance and professional trail services. This effort could provide additional funds currently unavailable to DSRF and better promote environmental, social and economic sustainability. To achieve Forest objectives, DSRF has to keep up with the funding landscape, create open and consistent communication regarding priority projects and required future funding and create a checklist to determine the applicability of available grants. The grant application process should be integrated and streamlined to allow for greatest efficiency. Due to the current staff load, the Forest would need to hire an additional staff member to manage grant research and applications, establish grant writing workshops, strengthen relationships with grant providers and local businesses and stakeholders and to track and identify efficient and effective grant processes. If the Forest decides to outsource these tasks to a third party, they'll need to hire a grant team with expertise, experience, diverse skills, collaborative approaches and whose members are continuously learning, resourceful, proactive, result-oriented and have project management skills.

Diversify Funding Sources

The Forest must explore alternative funding avenues besides grants. These funds could come from sponsorships, crowdfunding or partnerships that offer financial stability alongside the funds received from grants. Currently, most of the Forest's funds come from the Parks and Recreation Trust Fund (PARTF) which often does not cover the cost of routine maintenance. DSRF needs to set an annual maintenance budget for a specific amount of trail miles to begin to consistently address the backlog of maintenance concerns. DSRF should also implement a streamlined process to create contracts for most profession-based trail maintenance work. Currently, reviews are required for any projects with a value over $100,000. This process is beneficial for large projects, however, when pursuing routine maintenance funds, it slows down DSRF's ability to efficiently address maintenance concerns. This process would be greatly expedited if contracts for primarily maintenance-based work are executed as "on-call' with only an annual State Construction Office review. Contracts could be utilized for routine professional trail maintenance and small capital improvements.

Benchmarking

DSRF should implement a benchmarking system of self-evaluation, set standards for achievement and their ability to deliver recreational services. This allows the Forest to actively recognize the steps that have been achieved toward an overall goal allowing the Forest to remain in check with objectives and pursuits. Some organizations such as the National Parks and Recreation Association (NPRA) provide benchmarking certifications or resources to assist an organization's search for specific objectives, grants or organizational achievements.

6.2 Metrics

DuPont State Recreational Forest (DSRF) is a widely valued resource for its environmental, economic and recreational benefits to the region. The planning team utilized a five-objective metric system to assess and determine the planning elements required to address the existing conditions and future needs of the DSRF with a special focus on environmental, social and economic sustainability. The objects of the metric assessment included:

- National, Regional and Local Comparisons
- User Concentrations
- User Group Preferences
- Public Input Priorities
- Focus Group & Stakeholder Group Priorities

Information was collected through a series of thorough processes that provided the planning team with documentation was re-examined to emphasize the priorities for existing and new recreational programs, management practices and facilities. These processes included research and public input information collection with a special focus on recreational needs, use levels and management and maintenance practices.

6.2.1 NATIONAL, REGIONAL & LOCAL COMPARISONS

To gain an accurate understanding of the current level of DSRF visits, it is vital to compare Forest metrics to those of other national, regional and local outdoor recreation areas to identify best practices, areas for improvement and opportunities for collaboration. Of the 12,489 acres within the Forest boundary, DSRF received roughly 1,214,000 visits from users in 2022 ***(see Figure 3-1: DuPont State Recreational Forest Recorded Annual Visitation)***. The quantity of visits based on Forest acreage equals about 96 visitors per acre. In comparison, in recent years, the Great Smoky Mountains National Park received roughly 26 visits per acre of protected land[30] and the South Mountains State Park had approximately 25 visits per acre ***(see Figure 6-1: Visitors by the Numbers)***[31,32]. These statistics demonstrate the large volume of use DSRF has experienced in recent years based on Forest acreage. This high level of use has severely impacted the Forest's trail quality, user experience and maintenance capabilities. As the trends indicate, the high level of visits has continued to increase over the years and with its popularity, it is presumed that DSRF will either maintain or continue to receive greater quantities of visits in future years. Due to this elevated level of use, it is essential to identify the areas of user concentration to pinpoint locations with greater maintenance requirements and ways to utilize available fund more effectively.

Figure 6-1: Visitors by the Numbers. Comparing visits per acre with other outdoor recreational areas.

6.2.2 USER CONCENTRATIONS

To gain a better understanding of the current levels of use for the existing trail system, access areas and points of interest it was necessary to solicit public feedback to identify assets categorized as either high, medium or low use and to determine the distance most visitors travel to DSRF. Of the trails and roads within DSRF, 98% are classified as multi-use; this means all user groups have the potential to use virtually all trails, points of interest and access areas. The identification of concentration areas allowed the planning team to find means to efficiently address maintenance needs and allocate resources to the high-priority items. User locations were also obtained to determine the distance they were traveling to visit the Forest. This information helped the planning team to determine the concentrations of users throughout the region and identify the areas from which most visitors travel. This process was constructed through online surveys, parking lot surveys and public input sessions. The public was asked to identify favored trails, points of interest and access areas in addition to providing their home zip code. The results were mapped to graphically represent high, medium and low-use assets and user locations ***(see Figures 6-2 through 6-5 for graphic representations of the following presented information).***

MOST FAVORED TRAILS

#	TRAIL	RESPONSES
1	Jim Branch Trail	199
2	Ridgeline Trail	193
3	Hickory Mountain Trail	115
4	High Falls Loop	101
5	Reasonover Creek Trail	98
6	Thomas Cemetery Road	92
7	Turkey Knob Trail	92
8	Hooker Creek Trail	92
9	Big Rock Trail	86
10	Buck Forest Road	78

LEAST FAVORED TRAILS

#	TRAIL	RESPONSES
1	Table Rock Trail	0
2	Lake View Loop	0
3	Grassy Meadow Trail	2
4	Nooks Trail	2
5	Frank Street	2
6	Flat Rock Trail	3
7	Flatwoods Trail	4
8	Holly Road	5
9	Poplar Hill Trail	6
10	Plantation Trail	6

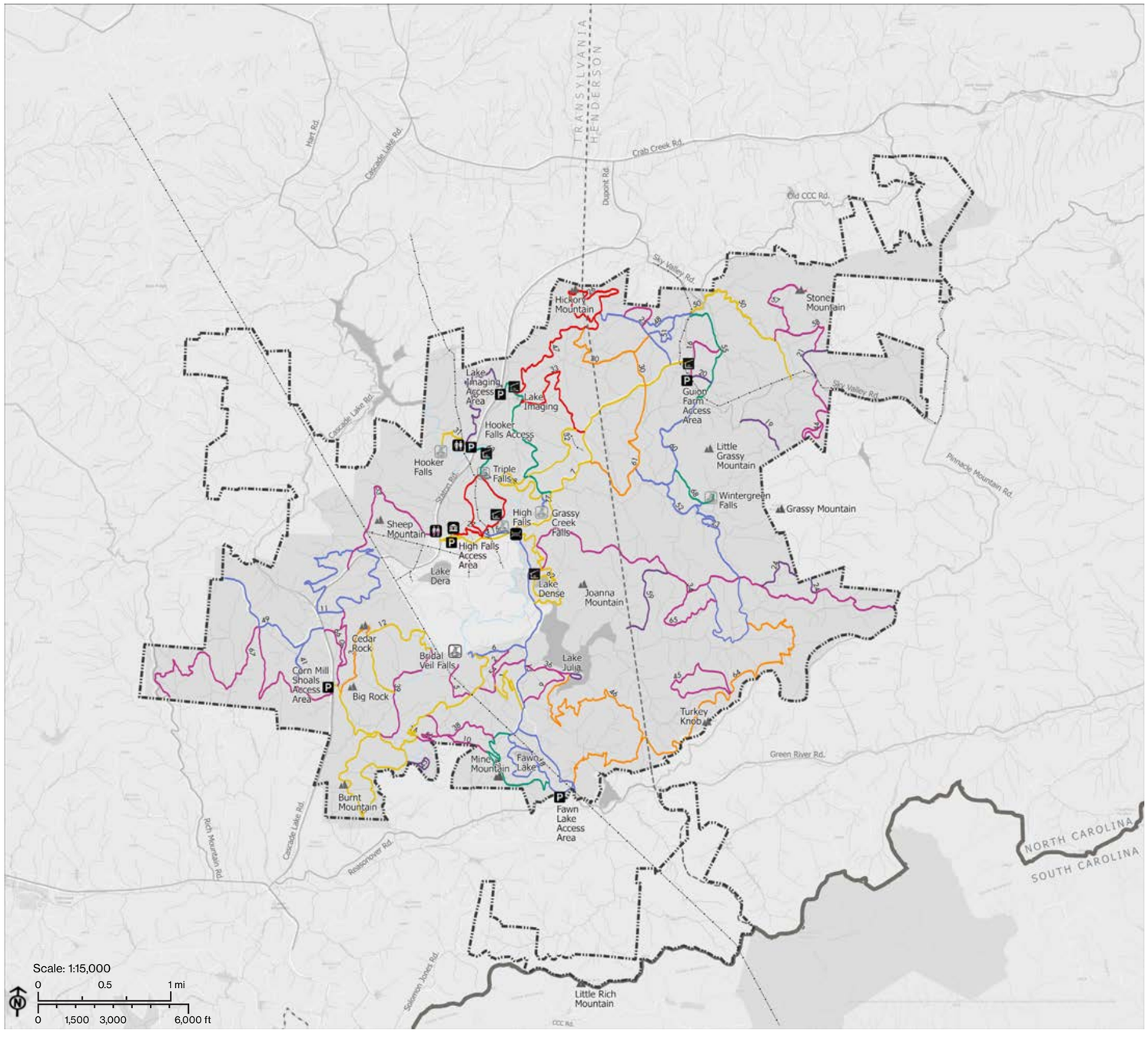


Figure 6-2: DuPont State Recreational Forest Public Input Drop in Board—Quantified Trail Ranking

DUPONT STATE RECREATIONAL FOREST

Quantified Trail Favor

LEGEND

- DSRF Boundary
- County Boundaries
- Access Area
- Picnic Shelter
- Restrooms
- Visitor Center
- Waterfalls
- Peaks
- Powerlines
- NC State Roads, Paved
- NC State Roads, Gravel
- US Routes
- NC Routes
- Little River
- Streams
- Water Bodies
- 0 - 5 Favored Use
- 6 - 20 Favored Use
- 21 - 40 Favored Use
- 41 - 60 Favored Use
- 61 - 80 Favored Use
- 81 - 100 Favored Use
- 101 - 200 Favored Use

Trails

1 Airstrip Trail, 1.0
2 Barn Trail, 0.3
3 Big Rock Trail, 0.8
4 Boundary Trail, 0.4
5 Bridal Overlook Trail, 0.5
6 Bridal Veil Falls Road, 0.6
7 Briery Fork Trail, 1.5
8 Buck Forest Road, 3.2
9 Burnt Mountain Trail, 2.2
10 Camp Summit Road, 0.5
11 Cart Trail, 0.5
12 Cascade Loop, 3.1
13 Cedar Rock Trail, 1.5
14 Conservation Road, 2.6
15 Corn Mill Shoals Trail, 2.7
16 Covered Bridge Trail, 0.2
17 Farmhouse Trail, 0.6
18 Fawn Lake Loop, 0.6
19 Fawn Lake Road, 1.0
20 Flat Rock Trail, 0.5
21 Flatwoods Trail, 0.2
22 Frank Street,0.4
23 Grassy Creek Falls Trails, 0.2
24 Grassy Creek Trail, 0.9
25 Grassy Meadow Trail, 0.9
26 Hickory Mountain Road, 0.9
27 Hickory Mountain Trail, 1.6
28 High Falls Loops, 1.4
29 Hilltop Trail, 1.0
30 Holly Road, 1.3
31 Hooker Creek Trail, 1.6
32 Hooker Falls Trail, 0.4
33 Isaac Heath Trail, 0.8
34 Jim Branch Trail, 1.3
35 Joanna Road, 1.6
36 Lake Imaging Road, 1.5
37 Lake Julia Road, 0.4
38 Lake View Loop, 0.2
39 Laurel Ridge Trail, 0.9
40 Little River Trail, 1.1
41 Longside Trail, 0.8
42 Micajah Trail, 0.4
43 Mine Mountain Trail, 1.4
44 Nooks Trail, 0.4
45 Plantation Trail, 1.2
46 Poplar Hill Trail, 1.4
47 Reasonover Creek Trail, 3.5
48 Ridgeline Trail, 1.4
49 Rifle Trail, 0.5
50 Rock Quarry Road, 1.3
51 Rocky Ridge Trail, 1.5
52 Ruffed Grouse Trail, 1.0
53 Sandy Trail, 0.6
54 Sheep Mountain Road, 1.6
55 Shelter Rock Trail, 0.6
56 Shoal Creek Trail, 1.0
57 Shoals Creek Trail, 1.0
58 Stone Mountain Trail, 1.0
59 Switchback Trail, 0.6
60 Table Rock Trail, 0.9
61 Tarkiln Branch Road, 1.4
62 Thomas Cemetery Road, 1.6
63 Three Lakes Trail, 1.9
64 Triple Falls Trail, 0.4
65 Turkey Knob Trail, 4.5
66 Twin Oaks Trail, 0.9
67 Twixt Trail, 0.4
68 Wilkie Trail, 3.7
69 Wintergreen Falls Trail, 0.5

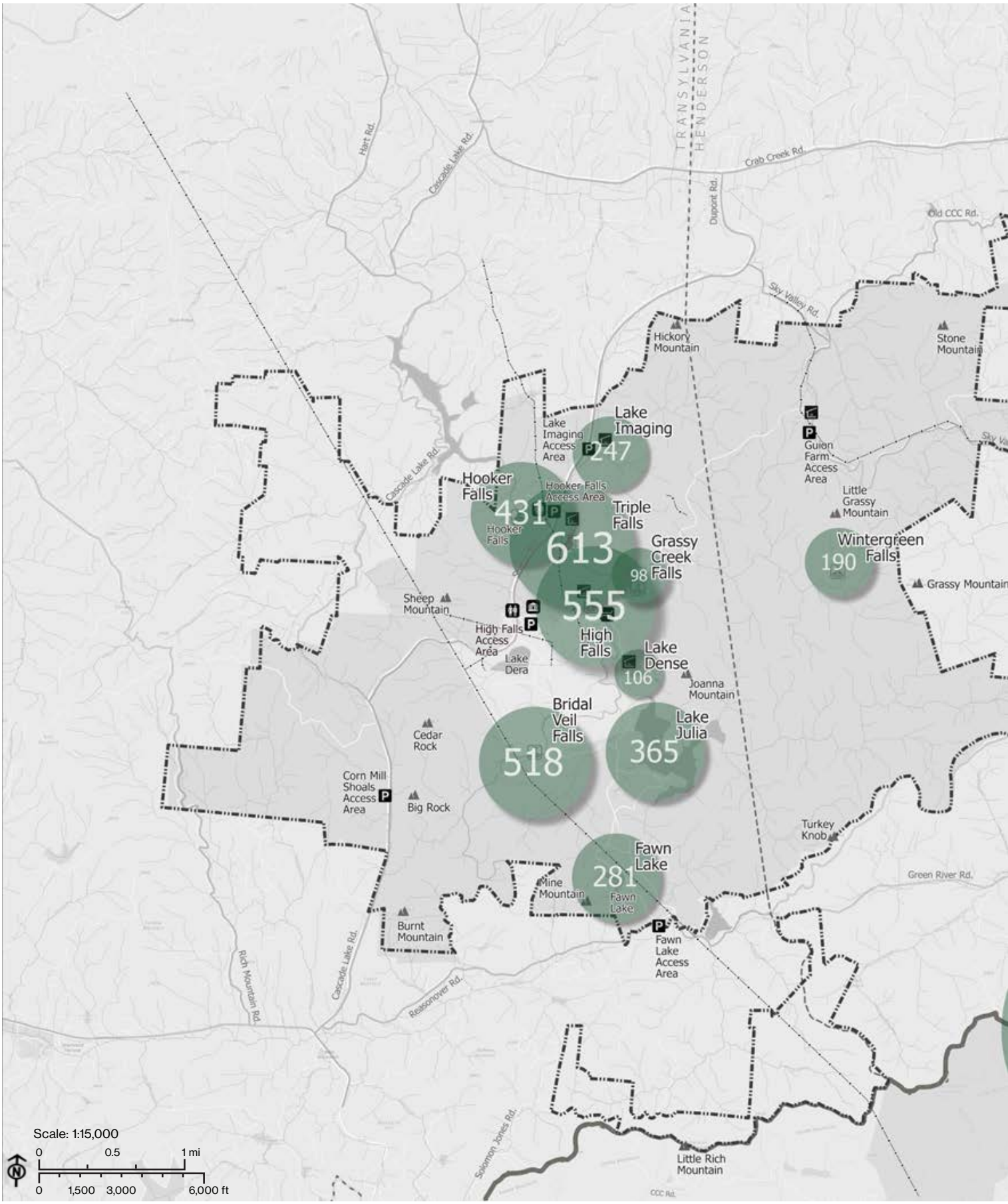


Figure 6-3: DuPont State Recreational Forest Public Input Drop in Board—Points of Interest Quantified Usage

DUPONT STATE RECREATIONAL FOREST

Quantified Points of Interest Favor

MOST FAVORED POINTS OF INTEREST

RANK	TRAIL	RESPONSES
1	Interconnected Trail System	2,797
2	Triple Falls	613
3	High Falls	555

LEAST FAVORED POINTS OF INTEREST

RANK	TRAIL	RESPONSES
1	Lake Dense	106
2	Wintergreen Falls	190
3	Other Points of Interest	208

LEGEND

- Access Areas Quantified Favor
- DSRF Boundary
- County Boundaries
- State Boundaries
- Access Area
- Picnic Shelter
- Restrooms
- Waterfalls
- Peaks
- Powerlines
- NC State Roads, Paved
- NC State Roads, Gravel
- US Routes
- NC Routes
- Little River
- Streams
- Water Bodies

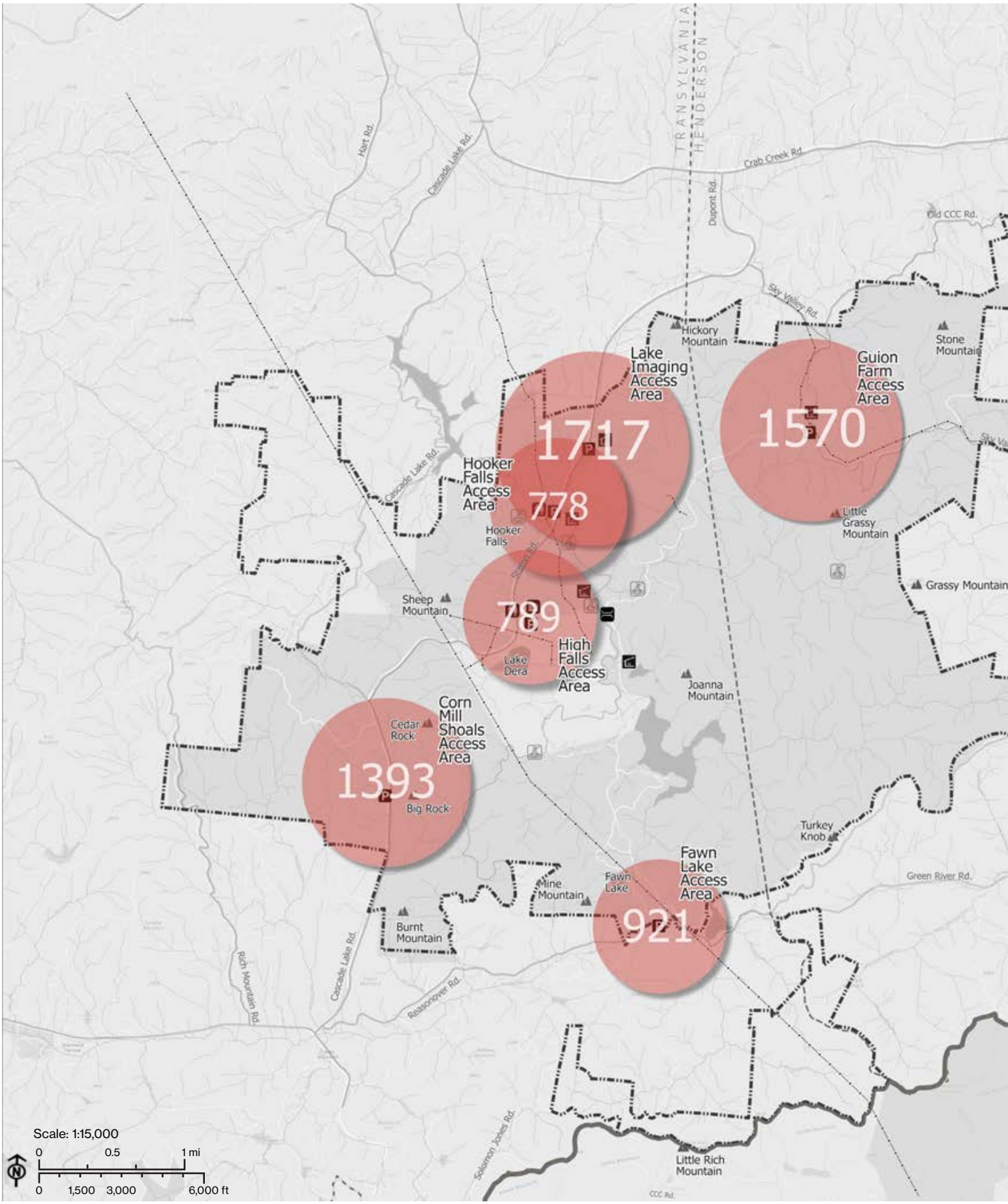
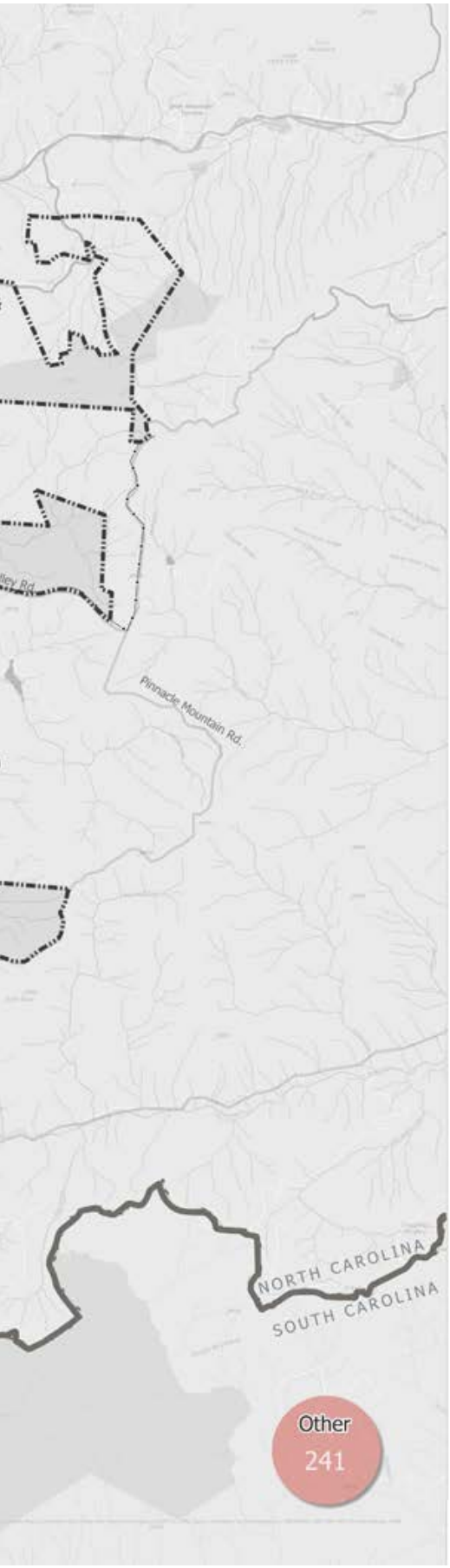


Figure 6-4: DuPont State Recreational Forest Public Input Drop in Board—Access Area Quantified Usage



DUPONT STATE RECREATIONAL FOREST

Quantified Access Areas Favor

MOST FAVORED ACCESS AREAS

RANK	ACCESS AREA	RESPONSES
1	Lake Imaging Access Area	1,717
2	Guion Farm Access Area	1,570
3	Corn Mill Shoals Access Area	1,393

LEAST FAVORED ACCESS AREAS

RANK	ACCESS AREA	RESPONSES
1	Other Access Areas	241
2	Hooker Falls Access Area	778
3	High Falls Access Area	789

LEGEND

- Access Areas Quantified Favor
- DSRF Boundary
- County Boundaries
- State Boundaries
- Access Area
- Picnic Shelter
- Restrooms
- Waterfalls
- Peaks
- Powerlines
- NC State Roads, Paved
- NC State Roads, Gravel
- US Routes
- NC Routes
- Little River
- Streams
- Water Bodies

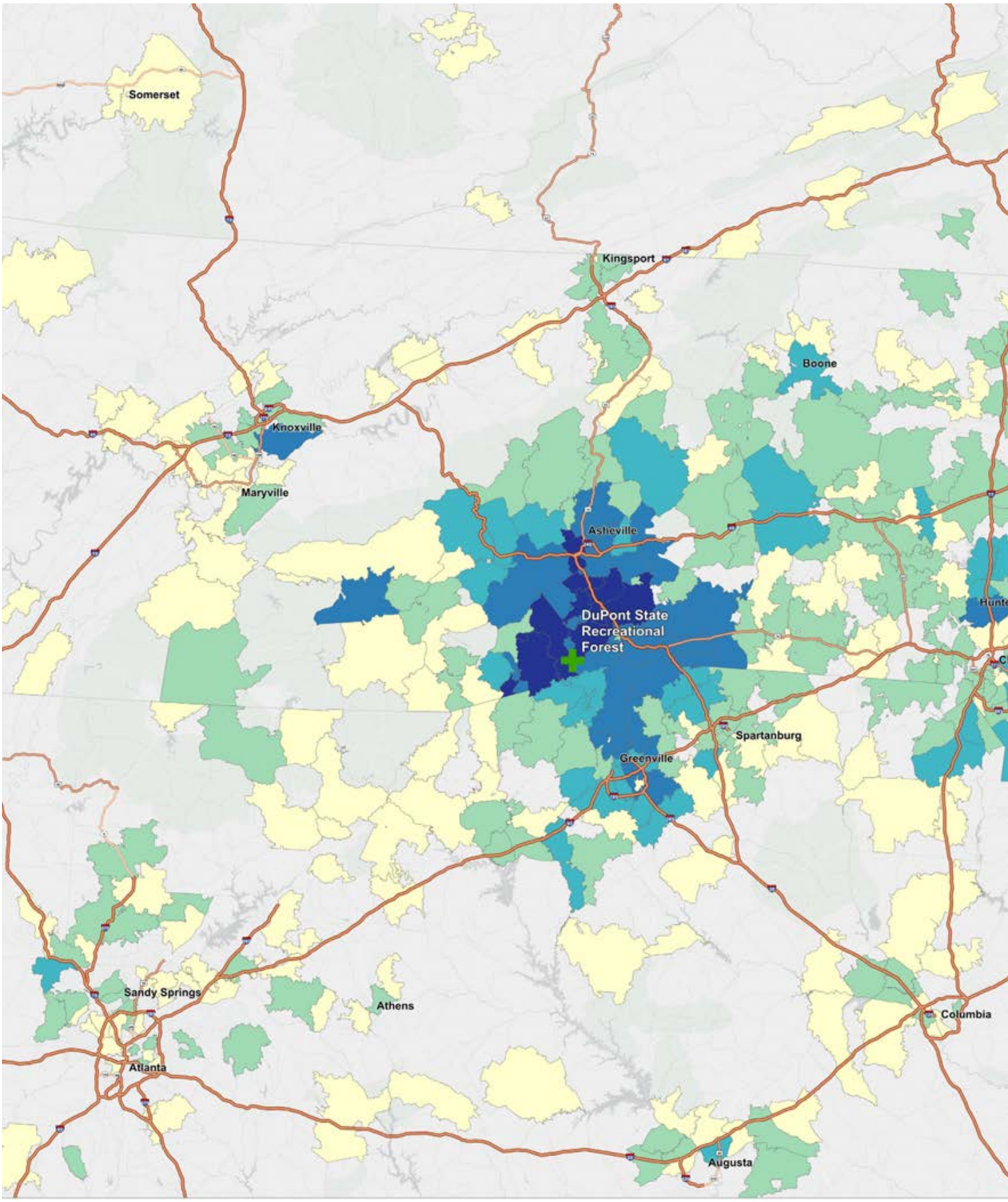
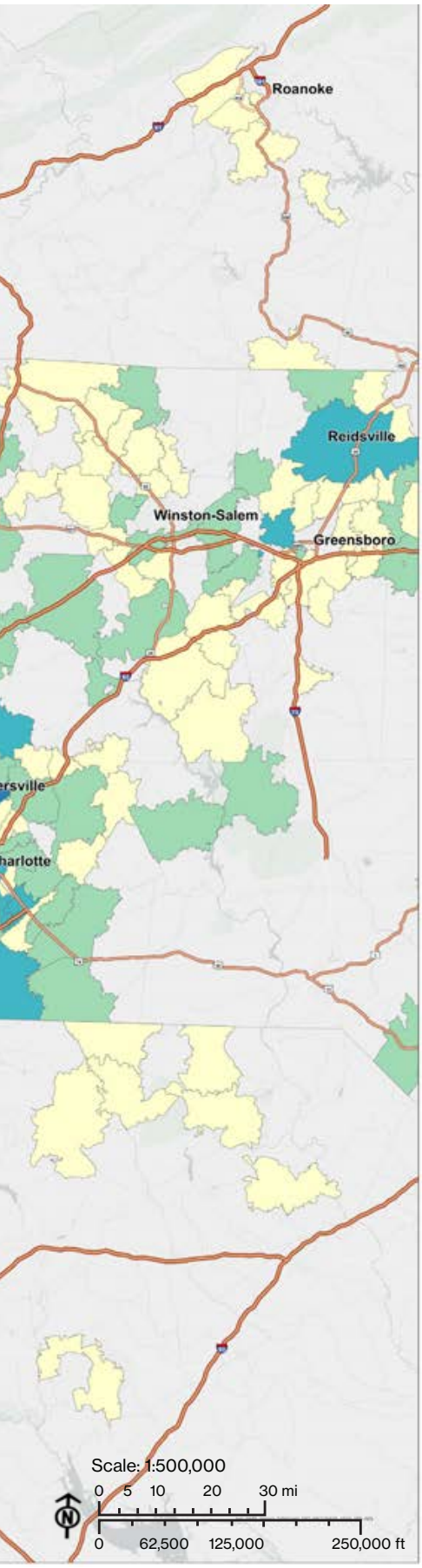


Figure 6-5: DuPont State Recreational Forest Public Input Drop-in Board—Visitors per Zip Code



DUPONT STATE RECREATIONAL FOREST

Visitors per ZIP Code

MOST RECORDED VISITOR ZIP CODES

RANK	ZIP CODE	DRIVE TIME	RESPONSES
1	28712	0-1 hrs	549
2	28739	0-1 hrs	205
3	28768	0-1 hrs	193

LEAST RECORDED VISITOR ZIP CODES

The zip codes recorded with just one to five responses could be found throughout the United States ranging from West Coast states to participants who live one hour to over five hours away from DSRF.

of ZIP Codes in Survey

804
NATIONAL

5
INTERNATIONAL

Online Survey

3,548
RESPONSES

Drive Time Visitor Percentages

0-1 hrs	1-2 hrs	2-5 hrs	> 5 hrs
62%	**12%**	**17%**	**9%**

LEGEND

- DSRF
- Interstate
- US Highway
- State / County Highway
- 0 - 1 DSRF Visitors
- 2 - 5 DSRF Visitors
- 6 - 10 DSRF Visitors
- 11 - 50 DSRF Visitors
- 51 - 549 DSRF Visitors

6.2.3 USER GROUP PREFERENCES

Several user groups utilize the 81 miles of multi-use trails throughout the Forest. These visitors play such a large part in the social sustainability of the Forest that it was vital to learn each group's preferences and priorities to ensure equal consideration was given during the needs assessment and recommendation phases of the planning process. The focus groups identified were equestrians, mountain bikers, hikers and trail runners, outdoorsmen and general users. This information provided a more well-rounded understanding of how the Forest is used. During the first and second public input drop-ins (PIDI), participants were asked to collect stickers representing their association with a particular user group. The analysis of this information carried weight during the recommendation phase to best balance the impact on all user groups. The information collected revealed the following information which was then used in the planning process:

Equestrians

	HIGHEST RANKED	LOWEST RANKED
Trails	Thomas Cemetery Road Jim Branch Trail Turkey Knob	Boundary Trail Flat Rock Trail Grassy Meadow Trail Lake View Loop Little River Trail Longside Trail Nooks Trail Table Rock Trail Twixt Trail
Points of Interest	Interconnected Trail System Other Points of Interest Lake Imaging	Lake Dense Bridal Veil Falls Grassy Creek Falls
Access Areas	Guion Farms Access Area Other Access Area, Lake Imaging Access Area	High Falls Access Area, Hooker Falls Access Area Fawn Lake Access Area

Mountain Bikers

	HIGHEST RANKED	LOWEST RANKED
Trails	Ridgeline Trail Jim Branch Trail Hickory Mountain Trail	Hickory Mountain Trail Flat Rock Trail Grassy Meadow Trail Lake View Loop Little River Trail Longside Trail Nooks Trail Table Rock Trail Twixt Trail Lake Dense Bridal Veil Falls Grassy Creek Falls High Falls Access Area, Hooker Falls Access Area Fawn Lake Access Area
Points of Interest	Interconnected Trail System No Point of Interest Lake Imaging Fawn Lake Other Points of Interest	Lake Julia Grassy Creek Falls High Falls Hooker Falls Triple Falls Wintergreen Falls
Access Areas	Lake Imaging Access Area Guion Farms Access Area Corn Mill Shoals Access Area	Hooker Falls Access Area High Falls Access Area Other Access Areas

Hikers / Trail Runners

	HIGHEST RANKED	LOWEST RANKED
Trails	Wintergreen Fall Trail High Falls Loop Hooker Falls Trail	Burnt Mountain Trail Camp Summit Road Farmhouse Trail Flatwoods Trail Frank Street Lake View Loop Nooks Trail Plantation Trail Table Rock Trail
Points of Interest	Interconnected Trail System Bridal Veil Falls Hooker Falls	No Points of Interest Grassy Creek Falls Lake Dense Fawn Lake High Falls Wintergreen Falls
Access Areas	Guion Farms Access Area Hooker Falls Access Area Other Access Area	Corn Mill Shoals Access Area Lake Imaging Access Area High Falls Access Area

Outdoorsmen

	HIGHEST RANKED	LOWEST RANKED	
Trails	Grassy Creek Trail	Airstrip Trail	Grassy Meadow Trail
	Rifle Trail	Barn Trail	Hickory Mountain Trail
	Corn Mill Shoals Trail	Bridal Overlook Trail	Holly Road
	Covered Bridge Trail	Bridal Veil Falls Road	Hooker Creek Trail
	Hilltop Trail	Buck Forest Road	Hooker Falls Trail
	Shoal Creek Trail	Camp Summit Road	Isaac Heath Trail
		Cascade Loop	Jim Branch Trail
		Cedar Rock Trail	Lake View Loop
		Fawn Lake Loop	Longside Trail
		Fawn Lake Road	Nooks Trail
		Flat Rock Trail	Rocky Ridge Trail
		Flatwoods Trail	Sandy Trail
		Frank Street	Shelter Rock Trail
		Shoals Trail	Triple Falls Trail
		Stone Mountain Trail	Twin Oaks Trail
		Switchback Trail	Twixt Trail
		Table Rock Trail	Wilkie Trail
		Thomas Cemetery Road	Wintergreen Falls Trail
		Three Lakes Trail	High Falls Access Area
Points of Interest	Other Points of Interest	Interconnected Trail System	High Falls
	No Points of Interest	Lake Dense	Hooker Falls
	Lake Julia	Lake Imaging	Triple Falls
	Fawn Lake	Bridal Veil Falls	Wintergreen Falls
		Grassy Creek Falls	
Access Areas	Guion Farms Access Area	Hooker Falls Access Area	
	Other Access Area,	Lake Imaging Access Area	
	Fawn Lake Access Area	Corn Mill Shoals Access Area	
		High Falls Access Area	

General Users:

	HIGHEST RANKED	LOWEST RANKED	
Trails	Ridgeline Trail	Boundary Trail	Lake View Loop
	Jim Branch Trail	Bridal Overlook Trail	Little River Trail
	Big Rock Trail	Briery Fork Trail	Micajah Trail
	Grassy Creek Falls Trail	Cart Trail	Poplar Hill Trail
		Cascade Loop	Rifle Trail
		Farmhouse Trail	Ruffed Grouse Trail
		Fawn Lake Loop	Sandy Trail
		Flat Rock Trail	Sheep Mountain Road
		Flatwoods Trail	Shelter Rock Trail
		Frank Street	Shoal Creek Trail
		Grassy Creek Trail	Switchback Trail
		Grassy Meadow Trail	Table Rock Trail
		Joanna Road	Twin Oaks Trail
		Lake Julia Road	Twixt Trail
Points of Interest	Interconnected Trail System	Bridal Veil Falls	Grassy Creek Falls
	Other Points of Interest	Lake Dense	High Falls
	No Points of Interest	Lake Julia	Hooker Falls
		Lake Imaging	Triple Falls
		Fawn Lake	Wintergreen Falls
Access Areas	Guion Farms Access Area	High Falls Access Area	
	Hooker Falls Access Area	Lake Imaging Access Area	
	Corn Mill Shoals Access Area	Fawn Lake Access Area	
		Other Access Areas	

The planning team recognized that the majority of participants who identified themselves as general users were local or regional users who tended to avoid the most-visited areas of the Forest such as the waterfall corridor. The most-visited areas have been noted as being used primarily by users who are considered tourists who travel to the Forest from outside of the region.

Analysis of PIDIs one and two results revealed that although user groups had various preferences for trails, points of interest and access areas, they were closely aligned with regard to environmental, social or economic sustainability and Forest priorities, concerns and future opportunities (represented in Section 6.2.4 – Public Input Priorities).

6.2.4 PUBLIC INPUT PRIORITIES

Working closely with the North Carolina Forest Service, the planning team prepared surveys and public input session questions to provide the public with an opportunity to rank their concerns for the Forest and prioritize future programming opportunities through either online surveys, parking lot surveys or any of the three public input drop-in sessions. The planning team reviewed participants' responses and categorized them into the below list of needs:

- Quantified Priorities
- Quantified Concerns
- Preferred Future Opportunities

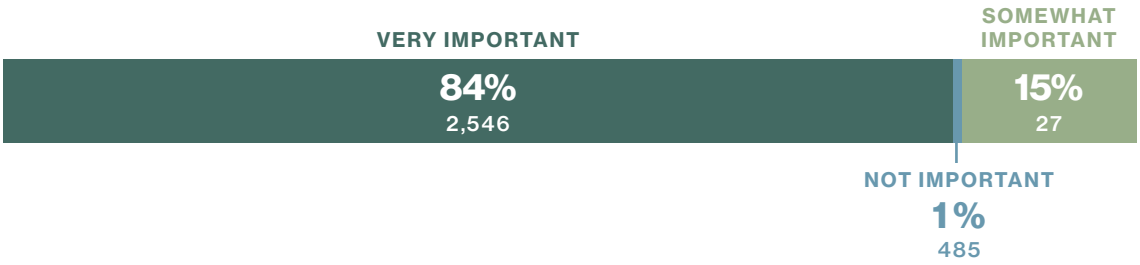
The needs listed on the following pages are based on user priorities from their experiences within the area and needs that require the attention of the Forest.

Whippoorwill photographed at DSRF

Quantified Priorities

- Protect the Ecological Integrity & Character of DSRF Natural Communities.
- Reduce the amount of erosion and sediment going into streams and rivers, improve wildlife habitats for game and non-game species and protect native plant and animal species.

How Important is it to you to protect the ecological integrity & character of DSRF's Natural Communities?



Rate the importance of the following natural resource objectives at DSRF. (Choose the top 3 in order of importance)

RANKED NATURAL RESOURCE OBJECTIVES AT DSRF	
1	Reduce erosion & sediment into streams & rivers
2	Improve wildlife habitat for game & non-game species
3	Protect native animal plant & animal species
4	Enhance the natural beauty of forests, waterfalls & rivers
5	Increase biodiversity across the landscape
6	Preserve the intrinsic value of natural communities
7	Produce forest products that are ecologically sustainable

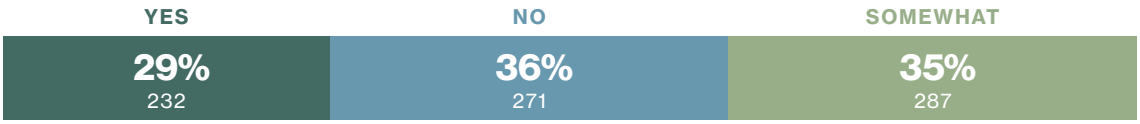
Quantified Concerns

- Reduce the negative impacts of recreational activities on the long-term ecology of the Forest.
- Maintain trails at their current level of use.
- The potential strain on current management and maintenance practices of the State Forest if new properties, recreational development and connections to regional trails become a focus.
- Reduce the occasional user group conflict on a small number of trails within the system.

Do you have concerns about the impact of recreational use on the long-term ecological sustainability of DSRF?

How concerned are you about the ability of DSRF to maintain trails and recreational systems at their current level of high visitor use?

Do you feel that a focus on new property access & recreation development, as well as connections to regional trails, could strain the current management & maintenance practices on the State Forest?



Do you feel a multiple use trail system is working well in DSRF?

Preferred Future Opportunities

- Additional recreational programming.
- Disperse users for more opportunities to experience solitude and less crowds.
- Provide access to regional trails.
- Provide clearly defined, ADA-accessible recreational opportunities.

Which of the following activities, currently offered within DSRF, would you like to see easier access to? (Select one)

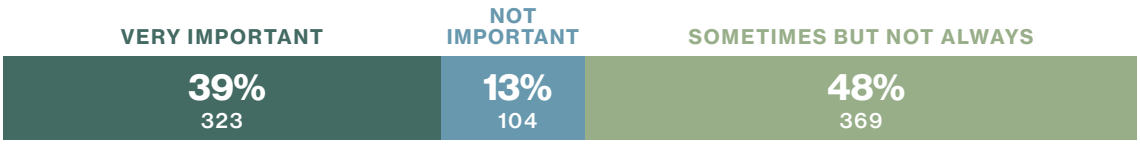
49%
CANOEING
PADDLE BOARDING
KAYAKING

25%
SWIMMING

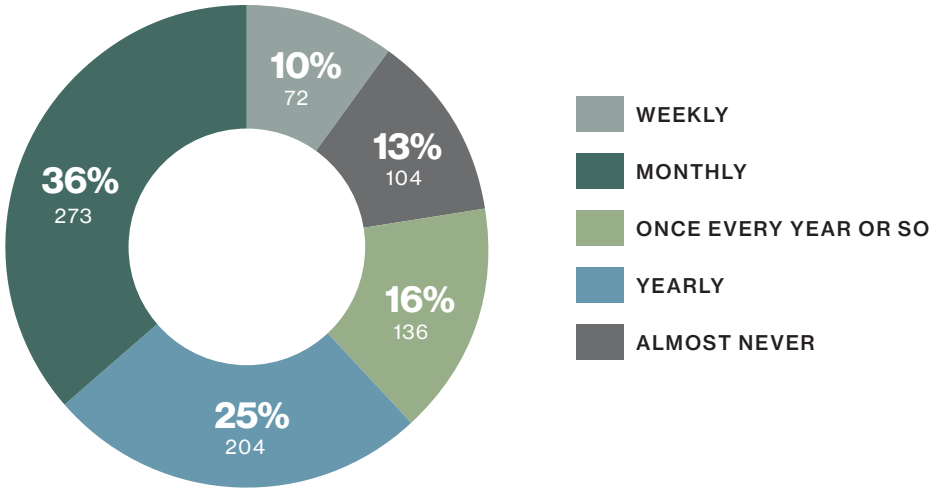
19%
PICNICKING

7%
PIER FISHING

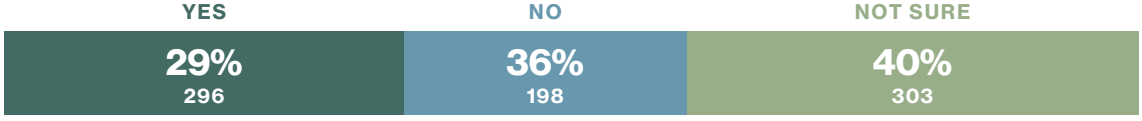
How important is it to you to have more opportunities for solitude & less crowded recreational experiences?



How many times a year would you use a regional trail that connected to DSRF?



Do you feel DSRF offers adequate facilities & outdoor recreation opportunities for visitors with limited mobility & visitors with an impairment or disability covered by the Americans with Disabilities Act of 1990?



6.2.5 FOCUS GROUP & STAKEHOLDER GROUP PRIORITIES

Working closely with the North Carolina Forest Service, the planning team scheduled three dates throughout the planning process to meet with focus groups and four dates to meet with stakeholder group representatives. The planning team reviewed participant responses and grouped them into the following categories:

- Existing Conditions
- Current and Future Concerns
- Future Visions for DSRF

In 2023, the planning team conducted three separate interviews with DSRF user groups representing equestrians, mountain bikers, hikers, or outdoorsmen. Each of these groups consisted of two to ten members. Group interviews were scheduled adjacent to the first three public input drop-in sessions held in May, July and November of 2023. Participants voiced their thoughts, concerns and priorities with the team and had an opportunity to ask questions of DSRF staff and the planning team. The planning team used these interviews to gather additional information and allow DSRF users an alternative setting to provide information and comments.

In addition to focus group interviews, the planning team conducted four local and regional stakeholder advisory committee meetings to discuss plan progress, information collection results and to request additional feedback on Forest plan recommendations. These meetings occurred in March, April and May of 2023 with the last occurring in February of 2024. The information gathered in both focus group interviews and stakeholder advisory committee meetings helped the team throughout the planning process and generated additional comments that were utilized when formulating the needs assessment and recommendations of this report.

Public Input Drop-In #1 Outdoorsmen Focus Group Interview, May 8, 2023

Key Takeaways:

1. Improve awareness of “Forest Rules”.
2. Encourage the enforcement of rules and regulations.
3. “Provide visitor center renovations”.
4. Offer education to enhance safety and visitor awareness.
5. Develop strategies to encourage “Good Behaviors”.
6. Address safety concerns at the waterfalls.
7. Promote a “Leave No Trace” mentality.
8. Provide parking lot trash cans.
9. Post signage about dogs (i.e., “Keep dogs on leash”)
10. Supply information for visitor preparedness (i.e., “There is no potable water in DSRF”).
11. Urge visitors to stay on the trail (i.e., “Be in nature ON the Trail”).
12. Keep the Forest as natural as possible.
13. Maintain public access to DSRF.
14. Communicate the reasons why trail management (direction, designation, closure, addition) may change.

6.3 Prioritization of Needs

The following prioritization of needs correlates directly to the needs assessment findings in Sections 6.1 and 6.2. Overall, Forest popularity has resulted in a maintained high levels visitation over the last few years and it is within reason to believe these trends will continue at the current level and may even increase in future years. DSRF should prepare for these visitation levels and make efforts in the future to accommodate this growth.

According to national, regional, local park and forest comparisons, the elevated visit levels are negatively impacting the ecological, social and economic sustainability of the Forest. The following priority list was developed based on the needs assessment, survey responses, public input drop-ins, focus group interviews, stakeholder group interviews and interviews with Forest staff. The priorities focus on addressing sustainability concerns and improvements. ***For more information regarding these priorities see Section 9—Recommendations.*** The planning team worked with DSRF staff to group these priorities according to realistic time frames and strategies for implementation. A schedule for improvements over the next fifteen years could be in line with upcoming grant applications and budget cycles or in the short term (next 5 years). Mid-term goals (6-10 years) are practical and realistic given near future budgets and improvements needed during this time frame. Improvements for the long term (11-15 years) were identified during the planning process, but specific funding strategies and implementation schedules are undetermined at this time.

15-Year Priority Improvements for Existing Trail Network

		continue with short-term recommendations	*continue with short & mid-term recommendations*
FOCUS	**SHORT TERM 1-5 years**	**MID TERM 6-10 years**	**LONG TERM 11-15 years**
FUNDS	Secure annual operating funds for trail maintenance		
TRAIL MAINTENANCE	Address all deferred trail maintenance needs Create & implement a strategy for regular trail inspections Classify trail maintenance work as volunteer or professional		Continue all maintenance strategies
ROAD MAINTENANCE	Address all deferred road maintenance needs Create and implement a strategy for regular road inspections		
PROFESSIONAL ASSISTANCE	Identify and implement a streamlined approach for professional engagement in maintenance and building needs	Develop relationships with several professional trail maintenance crews the Forest can utilize for special trail maintenance and building needs	
TRAIL MANAGEMENT	Address all recommended passive & soft trail closures Formulate an approach to communicate new trail management strategies with public implementation dates Implement trial periods or pilot programs for new practices on select trails and roads Establish clear channels for user feedback on new practices pilot program Identify priorities for future trail management strategies and categorize conceptual trails and additions to determine construction phasing	Address all hard trial closures Begin construction of the first set of new and extended trail segments Begin to address road crossing needs Communicate new trail management strategies Provide demonstrations and guided tours for stakeholders to highlight the benefits of new management practices	Construct all remaining new & extended trails Construct regional trail connections Incorporate all management strategies and continue to provide clear information about new practices
VOLUNTEERS	Create a second volunteer trail crew Implement workshops to train volunteers for maintenance tasks		
EMERGING TRENDS	Provide clear information about emerging trends and the regulations applied to those recreational technologies		Continue to provide clear information about emerging trends and the regulations applied to those recreational technologies
STAFF	Add two (2) full-time staff positions to plan, implement and monitor trial recommendations of Section 4—Trails (see staffing table)		

15-Year Priority Improvements for Management, Organization & Policies

FOCUS	SHORT TERM 1-5 years	MID TERM 6-10 years *continue with short-term recommendations*	LONG TERM 11-15 years *continue with short & mid-term recommendations*
OBJECTIVES	Continue to prioritize natural area preservation; allow this priority to steer all recreation-based decisions		
FUNDS	Research alternative fund collection processes; determine if grants should be pursued	Either hire one additional staff person or a consultant firm to begin grant research and applications and to set standard practices that expedite the grant process	Set a practice to ensure the grant research and application process is efficient and effective
PROFESSIONAL ASSISTANCE	Determine a path of streamlined contractual work with professional trail builders Hire professional trail builders to focus on deferred maintenance designated projects		Utilize professional trail builders to address maintenance concerns & construct additional new conceptual trails
VOLUNTEERS	Recruit additional volunteer trail crews Begin the organization of volunteer educational workshops	Host volunteer events with partner organization Establish volunteer groups for prioritized maintenance & operations services	Provide scheduled annual volunteer workshops to educate volunteers on safe & effective trail maintenance & repair methods Implement strategies such as an online calendar or volunteer sign-up portal to expedite the gathering of volunteers for certain projects or operations
EMERGING TRENDS	Utilize an existing or recently hired staff member to spend a portion of their time addressing visitor questions & concerns regarding eMTB use in DSRF Design & install additional signage providing Forest & legislative information about the restricted use of eMTBs on Forest land		
MANAGEMENT STRATEGIES		Begin communicating all new trail management objectives; install additional signage pertaining to management strategies	Ensure implementation of all new trail management objectives using signage & additional staff to focus on new strategy enforcement & monitoring Consider updating the Master Recreation Plan by year 15 to re-assess existing conditions & needs
STAFF	Develop prioritized staffing expansion plan to address recommendations for trail maintenance, Lake DERA, regional trails & social outreach needs (see staffing table)	Hire two (2) full-time staff person to focus on social media management for DSRF & follow state Forest media regulations to promote community engagement, safety concerns, trail updates & Forest ecological information (see staffing table) Hire one (1) additional staff member to monitor & manage volunteer efforts within the DSRF, to include providing educational workshops that ensure safe & efficient approaches to maintenance & repair work (see staffing table)	

15-Year Priority Staffing Additions

POSITION	SHORT TERM 1-5 years	MID TERM 6-10 years *in addition to short-term staffing*	LONG TERM 11-15 years *in addition to short & mid-term staffing*
LAKE DERA MANAGEMENT *management & law enforcement*	2	2	
SOCIAL MEDIA MANAGEMENT *social media, workshops, educational programs, outreach, signage & community engagement*		2	
VOLUNTEER MANAGEMENT *(monitoring & management of volunteer efforts & organization educational workshops*		1	
GRANT RESEARCH & MANAGEMENT *research, application & establishing standard practices*		1 (potentially)	
TRAIL STRATEGIES MANAGEMENT *enforcement & monitoring of trail strategies*	2		
CASCADE LAKE & CONTINENTAL DIVIDE MANAGMENT *management & law enforcement*			2
REGIONAL TRAIL CONNECTION MANAGEMENT *management & law enforcement*			1
TOTAL	**4**	**6**	**3**

Concept Plans

7 Concept Plans

Throughout the planning process conceptual plans have been developed to focus on the trail network, Lake DERA which is located within the "Donut Hole," the Cascade Lake area and the Continental Divide area. These were the four elements of DSRF that were identified as presenting present and future opportunities for DSRF that are environmentally, socially and economically sustainable.

The planning team thoroughly analyzed each of these properties through site visits, documentation of existing conditions and a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. This analysis process discerns the strengths, weaknesses, opportunities and threats that each opportunity presents and utilizes that information to provide conceptual plans and programming that are within these set parameters. The SWOT analysis process provided applicable direction for the conceptual recommendations, plans, cost estimates and programming for the identified recreational opportunities within DSRF.

The scope of work for this project was limited to conceptual planning for the Lake DERA, the Cascade Lake area and the Continental Divide area. The study of these areas will provide conceptual programming elements with the idea that surveys and site analysis will be performed prior to the production of design plans. Lastly, the conceptualized regional trail connection points would require additional study and surveying to determine the final locations for the connections to regional trails.

It should also be noted that the plans and programming elements included in this section are conceptual only and do not delve into a detailed examination of the existing conditions. Before implementation, full survey drawings of the existing conditions would be required and additional design refinements would be needed as part of a typical design process. A design team would need to be hired to perform these services to develop complete plans, details and specifications. Additionally, opinions of probable cost would be updated during the design to ensure that budget expectations are met. *See Section 8—Fifteen-Year Budget Plan for operations and maintenance costs related to the conceptual programming for Cascade, Continental Divide properties and regional connector trails.*

7.1 Trail Network

Throughout the trail network needs assessment process the planning team identified opportunities and constraints as the SWOT analysis process ***(See Section 4.2.2—Trail Opportunities & Constraints)***. The opportunities identified included a mix of trails in relatively sustainable alignments, most trails have adequate access from roads on either end, consistent trail density throughout the Forest and the strong impact of advocacy groups on trail sustainability. Constraints included few intact bridges with trails frequently crossing waterways, water funneling due to mixed user groups resulting in deep erosion ruts, user-created steep alignments and the sheer number of visits that trails are receiving resulting in damage to trails, streams, riverbanks and parking areas. Through this process, conceptual recommendations were formed to positively impact the environmental, social and economic sustainability of the trail network. These recommendations are graphically portrayed in Figure 7-1 and additional information about each of these recommendations and estimated costs can be found in Section 4—Trails.

CONCEPTUAL NEW TRAILS

- 70 Donut Hole High Falls Connect, 0.2
- 71 Jim Branch to Hooker Creek, 1.1
- 72 Ruffed Grouse to Boundary, 0.5
- 73 S. Parcel Through Trail, 3.3
- 73 S. Parcel Through Trail, 1.1
- 74 S. Parcel West Loop, 1.9
- 75 S. Parcel East Loop, 2.6

CONCEPTUAL CLOSED TRAILS

- 2 Barn Trail, 0.3
- 5 Bridal Overlook Trail, 0.5
- 10 Cart Trail, 0.5
- 24 Grassy Meadow Trail, 0.9
- 34 Joanna Road, 1.6
- 37 Lake View Loop, 0.2
- 43 Nooks Trail, 0.4
- 45 Poplar Hill Trail, 0.8
- 48 Rifle Trail, 0.5
- 52 Sandy Trail, 0.6
- 59 Table Rock Trail, 0.9
- 69 Kids Bike Loop, 0.4

RECOMMENDATIONS BY THE NUMBERS

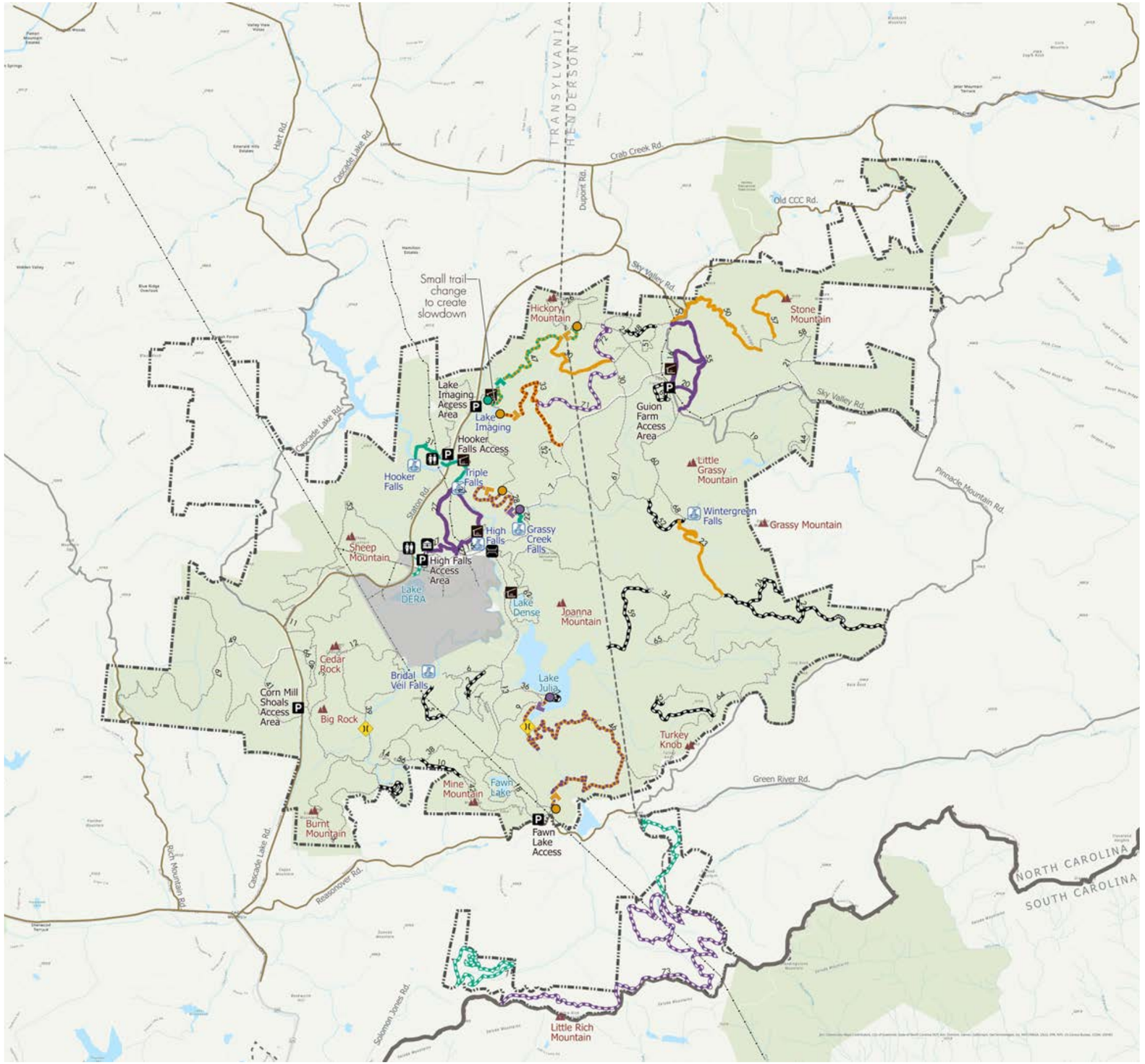
5.5 miles of trails gained
10.7 miles of new trails & 5.2 miles of trail closures

10.6 miles of Equestrian & Hike trails
Southern Parcel additions, Farmhouse, Shoal Creek, Flatwoods Trail, High Falls Loop, Ruffed Grouse to Boundary & Jim Branch to Hooker Creek

5.6 miles of Bike & Hike trails
Ridgeline, Hooker Creek, Rocky Ridge & Grassy Creek

5.2 miles of Trail Closures
Bridal Veil Overlook, Sandy, Grassy Meadow, Kids Bike Trail, Cart, Partial Poplar Hill, Rifle and Barn Trail

7.2 miles of Directional Trail Designations
Ridgeline, Jim Branch, Hilltop & Reasonover Creek Trail



DUPONT STATE RECREATIONAL FOREST

Existing & Conceptual Trail Map

LEGEND

- DSRF Boundary
- County Boundaries
- Access Areas
- Picnic Shelters
- Restrooms
- Visitor Center
- Waterfalls
- Covered Bridge
- Conceptual Bridge Crossings
- Peaks
- Powerlines
- State Roads, Paved
- State Roads, Gravel
- Little River
- Streams
- Water Bodies
- Authorized Access Only
- Conceptual Bikes & Hike Only
- Conceptual Equestrian & Hike Only
- Conceptual Hike Only
- Conceptual Equestrian & Bike Directional
- Conceptual Hike & Bike Directional
- Conceptual Bike Directional
- Conceptual New-Equestrian & Hike Only
- Conceptual New-Hike Only
- Closed-Conceptual Trails

Trails

1 Airstrip Trail, 1.0
2 Barn Trail, 0.3
3 Big Rock Trail, 0.8
4 Boundary Trail, 0.4
5 Bridal Overlook Trail, 0.5
6 Bridal Veil Falls Road, 0.6
7 Buck Forest Road, 3.2
8 Burnt Mountain Trail, 2.2
9 Camp Summit Road, 0.5
10 Cart Trail, 0.5
11 Cascade Loop, 3.1
12 Cedar Rock Trail, 1.5
13 Conservation Road, 2.6
14 Corn Mill Shoals Trail, 2.7
15 Covered Bridge Trail, 0.2
16 Farmhouse Trail, 0.6
17 Fawn Lake Loop, 0.6
18 Fawn Lake Road, 1.0
19 Flat Rock Trail, 0.5
20 Flatwoods Trail, 0.2
21 Frank Street,0.4
22 Grassy Creek Falls Trails, 0.2
23 Grassy Creek Trail, 0.9
24 Grassy Meadow Trail, 0.9
25 Hickory Mountain Road, 0.9
26 Hickory Mountain Trail, 1.6
27 High Falls Loops, 1.4
28 Hilltop Trail, 1.0
29 Holly Road, 1.3
30 Hooker Creek Trail, 1.6
31 Hooker Falls Trail, 0.4
32 Isaac Heath Trail, 0.8
33 Jim Branch Trail, 1.3
34 Joanna Road, 1.6
35 Lake Imaging Road, 1.5
36 Lake Julia Road, 0.4
37 Lake View Loop, 0.2
38 Laurel Ridge Trail, 0.9
39 Little River Trail, 1.1
40 Longside Trail, 0.8
41 Micajah Trail, 0.4
42 Mine Mountain Trail, 1.4
43 Nooks Trail, 0.4
44 Plantation Trail, 1.2
45 Poplar Hill Trail, 0.6
45 Poplar Hill Trail, 0.8
46 Reasonover Creek Trail, 3.5
47 Ridgeline Trail, 1.4
48 Rifle Trail, 0.5
49 Rock Quarry Road, 1.3
50 Rocky Ridge Trail, 1.5
51 Ruffed Grouse Trail, 1.0
52 Sandy Trail, 0.6
53 Sheep Mountain Road, 1.6
54 Shelter Rock Trail, 0.6
55 Shoal Creek Trail, 1.0
56 Shoals Creek Trail, 1.0
57 Stone Mountain Trail, 1.0
58 Switchback Trail, 0.6
59 Table Rock Trail, 0.9
60 Tarkiln Branch Road, 1.4
61 Thomas Cemetery Road, 1.6
62 Three Lakes Trail, 1.9
63 Triple Falls Trail, 0.4
64 Turkey Knob Trail, 4.5
65 Twin Oaks Trail, 0.9
66 Twixt Trail, 0.4
67 Wilkie Trail, 3.7
68 Wintergreen Falls Trail, 0.5
69 Kids Bike Loop, 0.4
70 Donut Hole High Falls Connect, 0.2
71 Jim Branch to Hooker Creek, 1.1
72 Ruffed Grouse to Boundary, 0.5
73 S. Parcel Through Trail, 3.3
73 S. Parcel Through Trail, 1.1
74 S. Parcel West Loop, 1.9
75 S. Parcel East Loop, 2.6

Scale: 1:15,000
0 0.5 1 mi
0 1,500 3,000 6,000 ft

Figure 7-1: Existing and Conceptual Trail Map

7.2 Donut Hole – Lake DERA

The "Donut Hole" is a 488-acre tract of land within DSRF. It comprises the former DuPont corporation manufacturing site and includes Lake DERA[33]. In addition to environmental and operational constraints and physiographic limitation, the Donut Hole is subject to multiple layers of perpetual regulatory constraints associated with hazardous materials remediation.

The public access to the property has been restricted largely due to ongoing remediation activities, with some portions being used by Forest staff for operational needs. Due to the multiple layers of constraints, only a small portion of the tract, including the area around Lake DERA, may be able to support recreational opportunities. The planning team conducted a SWOT analysis of Lake DERA to identify recreation-based opportunities and constraints of the site.

STRENGTHS

Additional programmable space to relieve visitation pressure occurring at waterfall corridor

Easily accessible body of water

Proximity to state road systems

Relatively level terrain and existing trail system in the area

WEAKNESSES

Presence of significant ecological features limits access and development

Environmental, operational and regulatory constraints within the immediately adjacent to the Lake DERA area

The area currently provides a non-public area critical for current Forest operations and training needs

Additional operating and management measures would need to be taken to ensure all restrictions of the area would be met

Limited area for additional recreational development

Would require additional staffing and training

Would require significant investment in built infrastructure and improvements to handle high use while protecting the significant ecological features

OPPORTUNITIES

ADA-accessible opportunities

New and additional recreational opportunities

Additional picnic areas, parking, walking paths and pavilion

New kayak launch, fishing piers and wetland viewing area

Potential revenue if facilities or services are rented or permits are issued

Provide a secure area for agency and cooperator training

THREATS

Unacceptable impacts to nearby ecological resources

Potential to infringe upon environmental and operational constraints and regulatory requirements affecting adjacent areas

Users violating the implemented safety protocols

Inability to adequately staff and manage the area

Inability to maintain additional built infrastructure

Addition of another high-use, highly impacted area to the already existing challenging areas to manage in the waterfall corridor (existing areas of heavy visitor impacts with ongoing safety issues and litter management

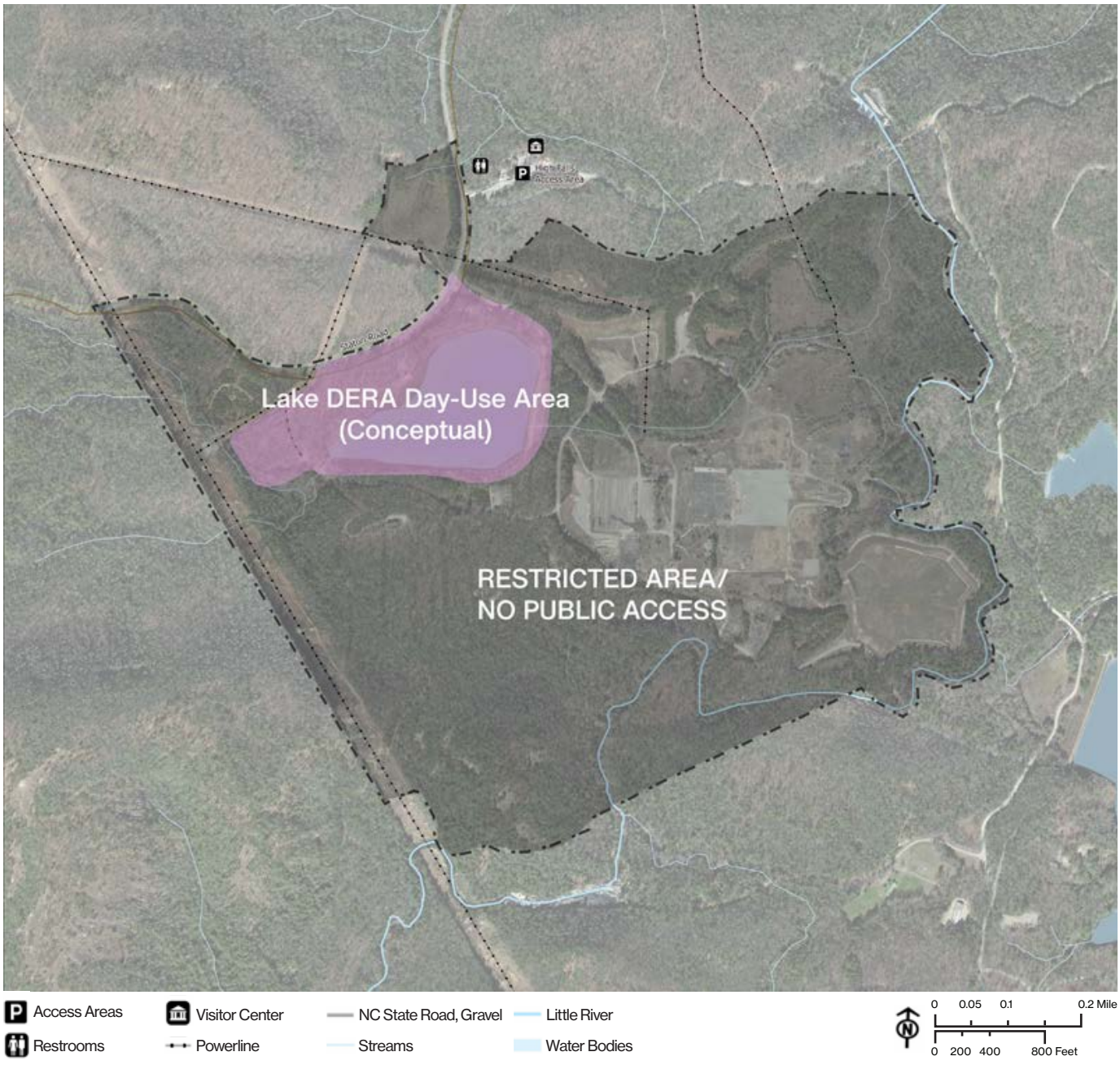


Figure 7-2: Lake DERA Conceptual Day-Use Area—Overall Site Review Map

The concept plan demonstrates the conceptual locations of a kayak launch, fishing piers, a gated road, picnic areas, walking paths and limited parking areas. Due to the adjacent land requiring additional measures to restrict user interactions, the concept plan is a comprehensive stand-alone recommendation that is not reliant on future expansion. The conceptual programming would enable DSRF to provide new ADA opportunities to a more diverse group of users. Certain measures must be taken such as a security gate restricting road access past the proposed conceptual plan and fencing to keep users from entering restricted areas.

The concept plan graphically represents these items for conceptual development. The plan is accompanied by a statement of probable costs for development and improvements represented in the Lake DERA concept plans. Please note that the amounts shown are for general conditions and soft costs that reflect each phase of work as if each phase represented is a single contract bid package.

Lake DERA Day-Use Area (Conceptual Design)

Opinion of Probable Construction Cost

Phase One (1-5 Years)	QTY	UNIT	COST	TOTAL
Security Gate	2	EA	$3,000.00	$6,000.00
New Trailhead Signage	1	EA	$1,000.00	$1,000.00
Gravel Parking Lot (10 spaces)	60	TON	$75.00	$4,500.00
ADA Walking Trail (asphalt; 8' width)	59000	SF	$15.00	$885,000.00
High Falls Connector Trail (mostly boardwalk)	9500	LF	$44.00	$418,000.00
Restrooms	1	EA	$500,000	$500,000.00
Perimeter Exclusion Fencing (10' ht. chain link)	7500	LF	$50.00	$375,000.00
			Phase Two Subtotal	***$2,189,500.00***
			10% General Conditions	*$218,950.00*
			15% Soft Costs (A/E + Admin)	*$328,425.00*
			20% Contingency	*$437,900.00*
			Total Cost Including Contingency	**$3,174,775.00**

Phase Two (6-10 Years)				
Open Air Pavilion	1	EA	$75,000.00	$75,000.00
New Road & Parking at Picnic Area (asphalt; 24' width)	45000	SF	$45.00	$2,025,000.00
Picnic Areas with Parking				
Picnic Tables	30	EA	$1,000.00	$30,000.00
Outdoor Grills	30	EA	$1,000.00	$30,000.00
			Phase Two Subtotal	**$2,160,000.00**
			10% General Conditions	*$216,000.00*
			15% Soft Costs (A/E + Admin)	*$324,000.00*
			20% Contingency	*$432,000.00*
			Total Cost Including Contingency	**$3,132,000.00**

Phase Three (11-15 Years)				
Boating Facilities	1	EA	$20,000.00	$20,000.00
ADA Kayak/Canoe Launch	1	EA	$2,000.00	$2,000.00
Fishing Piers	3	EA	$25,000.00	$75,000.00
Wetland Viewing Area	3	EA	$20,000.00	$60,000.00
Beach Renovation	1	EA	$100,000.00	$100,000.00
			Phase Three Subtotal	***$257,000.00***
			10% General Conditions	*$25,700.00*
			15% Soft Costs (A/E + Admin)	*$38,550.00*
			20% Contingency	*$51,400.00*
			Total Cost Including Contingency	**$372,650.00**

TOTAL FOR ALL PHASES $6,679,425.00

FOR COORDINATION ONLY - NOT FOR CONSTRUCTION

1. This conceptual cost opinion is for planning purposes only and the data needs to be reviewed and adjusted, as necessary, by the general contractor to determine the final construction budget.
2. The above cost does not include grading or utility installation per the lack of adequate survey information.
3. Phasing Estimate does not include 'Future Development Costs' or other site wide costs shown in overall estimate.

Lake DERA Day-Use Area (Conceptual Design)

Figure 7-3: Lake DERA Day-Use Area—Conceptual Site Design

Lake DERA Conceptual Programming


BEACH ACCESS


WETLAND VIEWING AREA


PIERS


KAYAK OR CANOE LAUNCH (ADA)


WALKING TRAILS (ADA)

TRAIL SIGNAGE


OPEN AIR PAVILION


BOAT FACILITIES


RESTROOMS


PICNIC AREAS

LEGEND

- Access Areas
- Restrooms
- Visitor Center
- Powerlines
- Streams
- Conceptual Development
- Conceptual Beach
- Buffer
- Existing Wetland
- Conceptual Trailhead
- Conceptual Security Gate
- Conceptual Picnic Spaces
- Conceptual Walking Trail
- Day-Use Access Road

Scale: 1:100

0 0.5 0.1 mi

0 50 100 200 300 400 ft

Figure 7-4: Lake DERA Day-Use Area—Potential Programming

7.3 New Properties

7.3.1 CASCADE LAKE

The Cascade Lake area is a 778.5-acre tract of land that was donated to the Forest in 2016[21]. This large piece of the Forest allows for additional recreational opportunities for those who prefer a more undeveloped experience or would appreciate greater solitude when visiting the Forest. Due to a lack of existing resources such as a survey of the land, the planning team focused on the conceptual programming of this area with the thought that a survey would be created at a later time. Once a survey is complete, it is recommended that DSRF hire a design team to create a series of schematic, design development and construction drawings prior to the installation of recreational elements. To identify applicable conceptual programming for this site, the planning team completed a SWOT analysis of recreational elements, which are detailed below:

STRENGTHS

Additional space to allow for user disbursement to reduce impacts of overuse in other parts of the Forest

Increased overall preserved and managed acreage

Ecological assets

WEAKNESSES

Minimal existing infrastructure connecting to DSRF

Wetland habitats restrict use in a large portion of this area

OPPORTUNITIES

Opportunity for outdoors group usage in less crowded areas

Less-developed recreational opportunities provide greater solitude for users

THREATS

New safety concerns that must be addressed

Expanded acreage increases the total area to be patrolled by DSRF staff

Potential emergency efforts if users do not follow trail rules and regulations

Through the SWOT analysis of the Cascade Lake area, it was determined that the area may best be used as a place that provides a less-developed experience for users. ***See Section 8—Fifteen-Year Budget Plan for conceptual operations and maintenance costs for conceptual programming elements.*** See Figure 7-5 and the below list for the complete list of conceptualized programming for the Cascade Lake area:

- Natural Heritage Area
- Hunting Opportunities
- Undeveloped Experience Area
- Scenic Enjoyment

7.3.2 CONTINENTAL DIVIDE

The Continental Divide area is made up of 717 acres of land that was donated to the Forest by Conserving Carolina in 2020[22]. The property is considered a crucial link between the Forest and the conservation corridor which extends along the South Carolina and North Carolina state line. The property is largely undeveloped, with a single existing main stem road passable by four-wheeled drive vehicles with several spur trails branching from it. To identify applicable conceptual recreational programming for this site, the planning team completed a SWOT analysis which is detailed below:

STRENGTHS

Large acreage of undeveloped and unfragmented Forest land relative to the surrounding properties

Increased overall preserved and managed acreage

Additional Space to allow for user disbursement to reduce impacts of overuse in other parts of the Forest

Existing road and trail infrastructure

WEAKNESSES

Adjacent to highly developed or intensively used neighboring properties

Minimal existing infrastructure connecting to DSRF

A gap of land not owned by DSRF lies between the primary DSRF property and the Continental Divide tract

Riparian and wetland habitats and designated natural area preserves restrict use in a portion of the tract

Shape of property with small corridors for recreational development

OPPORTUNITIES

Ability to reduce conflicts between trail user groups on the Forest trail system

Provide additional equestrian trail opportunities

Less-developed recreational opportunities provide greater solitude for users

Potential regional trail connection points

Existing road and trail infrastructure allow for potential new trails with minimal improvement

Provide Tier II disabled hunt and/or archery and small game hunting opportunities that fit the shape of the property and the proximity of neighbors

THREATS

Expanded acreage increases the total area to be patrolled by DSRF staff

Distance to tract increases patrol time

Limited access and distance for remote emergency response

Potential conflict between hunting and other users or neighbors

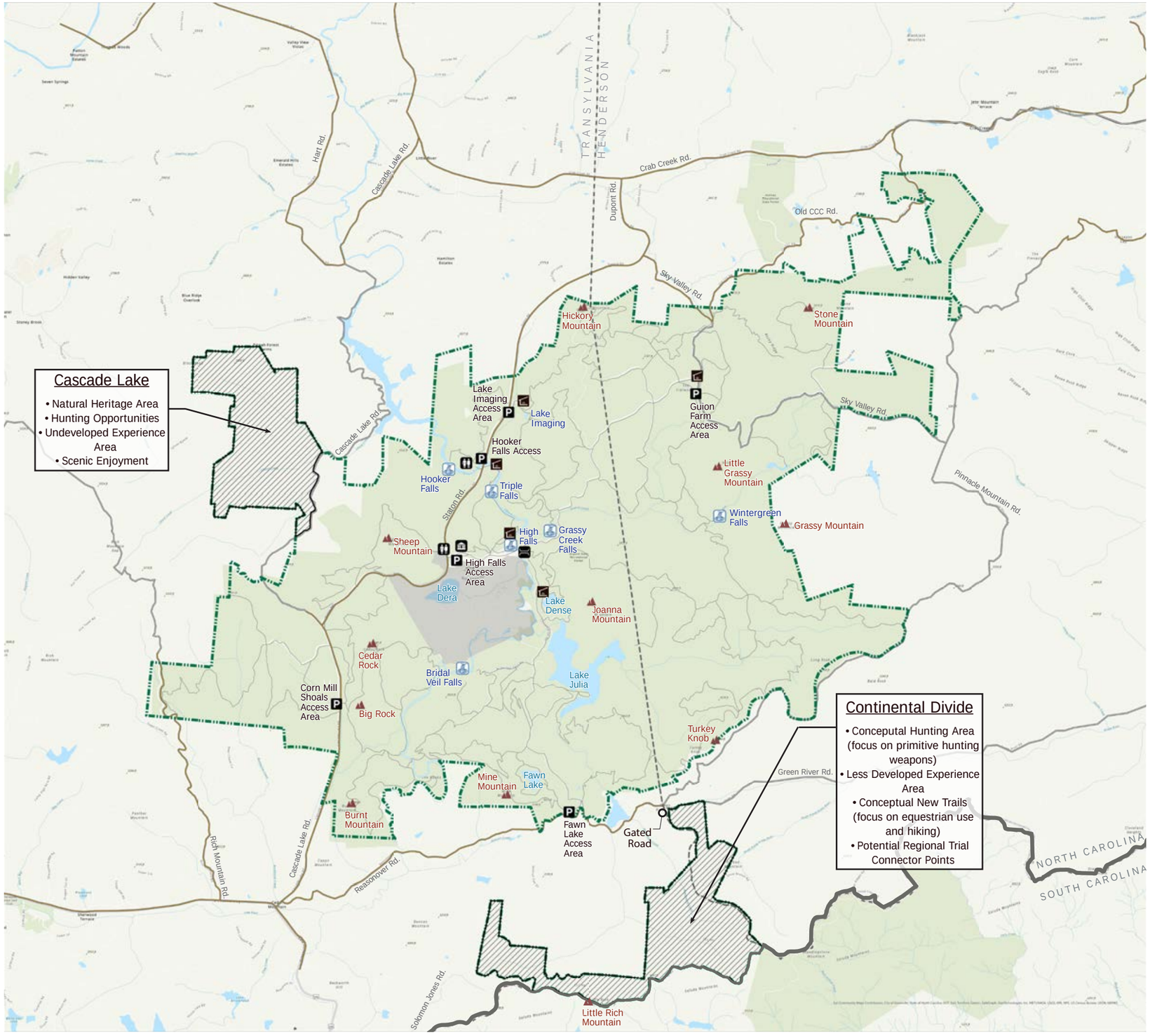
Potential issues concerning boundary line integrity and encroachment of neighboring properties

Due to the SWOT analysis, the planning team determined that the Continental Divide tract may be suitable for additional recreational opportunities that require the development of a portion of the area. ***See Section 8—Fifteen-Year Budget Plan for conceptual operations and maintenance costs for conceptual programming elements.*** See Figure 7-5 and the below list for the complete list of conceptualized programming for the Continental Divide area:

- Conceptual hunting area with focus on primitive hunting weapons
- Less developed experience area
- Conceptual new trails focused on equestrian use and hiking
- Potential regional trail connector points

Once recreational programming is determined, it is recommended that DSRF hire a design team to create a series of schematic, design development and construction drawings prior to the installation of any recreational elements.

New Properties



LEGEND

- DSRF Boundary
- County Boundaries
- State Boundaries
- Access Areas
- Picnic Shelters
- Restrooms
- Visitor Center
- Waterfalls
- Covered Bridge
- Peaks
- State Roads, Paved
- State Roads, Gravel
- Little River
- Streams
- Water Bodies
- Authorized Access Only
- Trails & Gated Roads
- New Properties

Scale: 1:15,000

0 0.5 1 mi

0 1,500 3,000 6,000 ft

Figure 7-5: New Properties—Conceptual Programming Identification

7.4 Regional Trails

DSRF is within proximity to five regional trails. These regional trails include the Ecusta Rails-to-Trails Project, the Palmetto Trail, The Foothills Regional Trail, the French Broad River Paddle Trail and the Mountains to Sea Regional Trail. Once a regional trail project leader expresses interest in connecting to the Forest, they will need to establish a relationship with DSRF and conduct a site analysis or survey to determine a suitable connection point. It is recommended that professional trail builders be hired by the regional trail project leader to create the connector trail. To identify the regional trail and conceptual connection points within the DSRF boundary the planning team conducted a SWOT analysis which guided the decision-making process for recreation-based recommendations:

STRENGTHS

Continental Divide tract is in proximity to the Palmetto Regional Trail Project

May provide future habitat corridors between public lands

Existing road accesses on southern boundary of the current DSRF property

WEAKNESSES

Connector trails may require easements or fee acquisitions

Dependency on the regional trail organization to be the primary leader

Dependency on the regional trail organization schedule of completion

Potential for undesired uses on the Forest (i.e. overnight camping)

OPPORTUNITIES

Opportunities for greater connectivity within the region and potentially across state lines

Increased connectivity for regional hikers

Greater opportunities for experiencing various environmental habitats and communities

THREATS

Limited ability or access to respond to emergency situations

State or county cooperation for responding to emergency situations

Concerns of users utilizing land outside of the DSRF and regional trail boundaries (an example being the YMCA Camp in Greenville, South Carolina)

Inability to acquire an easement or fee simple ownership

Potential lack of multi-agency cooperation

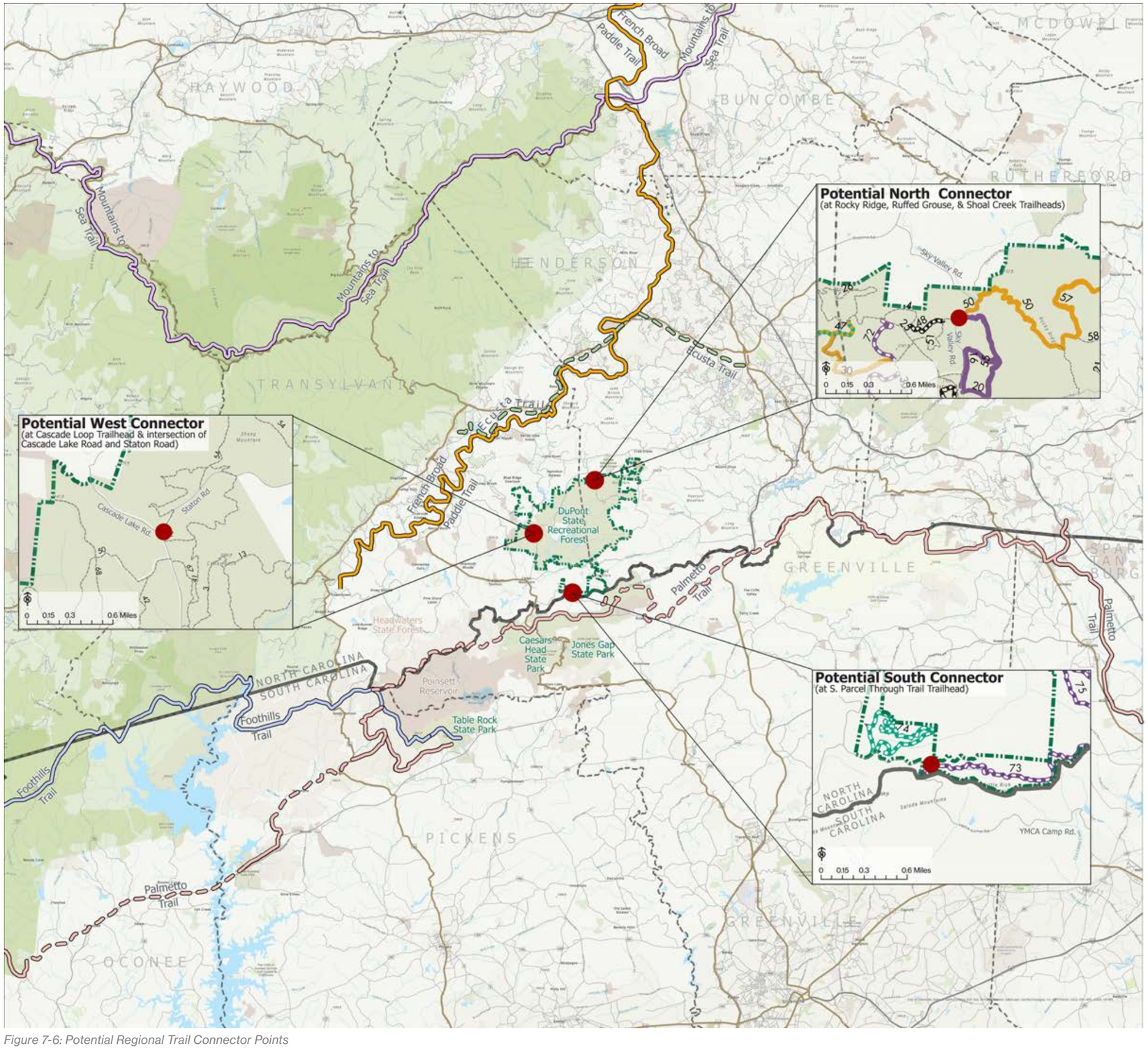
Increase in new users who may be less familiar with DSRF specific regulations, trail system and boundaries

Increase in users entering the Forest through a relatively remote area

Through the SWOT analysis, the planning team determined there were three suitable locations for connection points. Figure 7-6 provides graphic information about the Potential West Connector, Potential North Connector and Potential South Connector. These three connection points allow for potential connections to each of the five regional trails identified earlier in this section. ***See Section 8—Five Year Budget Plan for conceptual operations and maintenance costs for conceptual regional trail connections.***

DUPONT STATE RECREATIONAL FOREST

Potential Regional Trail Connector Points



LEGEND

- DSRF Boundary
- County Boundaries
- State Boundaries
- Limited Access
- Highway
- State Roads
- Rivers & Streams
- Water Bodies
- Potential Regional Trail Connector Points
- Foothills Regional Trail – Completed
- French Broad River Paddle Trail
- Mountains-to-Sea Regional Trail – Completed
- Palmetto Regional Trail – Completed
- Palmetto Regional Trail – Conceptual
- Ecusta Trail – Conceptual
- Regional Agency Special District Protected Lands
- Federal Protected Lands
- Jointly Managed Protected Lands
- Local Government Protected Lands
- Non-Governmental Organization Protected Lands
- Private Protected Lands
- State Protected Lands
- Territorial Protected Lands

Trails

1 Airstrip Trail, 1.0
2 Barn Trail, 0.3
3 Big Rock Trail, 0.8
4 Boundary Trail, 0.4
5 Bridal Overlook Trail, 0.5
6 Bridal Veil Falls Road, 0.6
7 Buck Forest Road, 3.2
8 Burnt Mountain Trail, 2.2
9 Camp Summit Road, 0.5
10 Cart Trail, 0.5
11 Cascade Loop, 3.1
12 Cedar Rock Trail, 1.5
13 Conservation Road, 2.6
14 Corn Mill Shoals Trail, 2.7
15 Covered Bridge Trail, 0.2
16 Farmhouse Trail, 0.6
17 Fawn Lake Loop, 0.6
18 Fawn Lake Road, 1.0
19 Flat Rock Trail, 0.5
20 Flatwoods Trail, 0.2
21 Frank Street,0.4
22 Grassy Creek Falls Trails, 0.2
23 Grassy Creek Trail, 0.9
24 Grassy Meadow Trail, 0.9
25 Hickory Mountain Road, 0.9
26 Hickory Mountain Trail, 1.6
27 High Falls Loops, 1.4
28 Hilltop Trail, 1.0
29 Holly Road, 1.3
30 Hooker Creek Trail, 1.6
31 Hooker Falls Trail, 0.4
32 Isaac Heath Trail, 0.8
33 Jim Branch Trail, 1.3
34 Joanna Road, 1.6
35 Lake Imaging Road, 1.5
36 Lake Julia Road, 0.4
37 Lake View Loop, 0.2
38 Laurel Ridge Trail, 0.9
39 Little River Trail, 1.1
40 Longside Trail, 0.8
41 Micajah Trail, 0.4
42 Mine Mountain Trail, 1.4
43 Nooks Trail, 0.4
44 Plantation Trail, 1.2
45 Poplar Hill Trail, 0.6
45 Poplar Hill Trail, 0.8
46 Reasonover Creek Trail, 3.5
47 Ridgeline Trail, 1.4
48 Rifle Trail, 0.5
49 Rock Quarry Road, 1.3
50 Rocky Ridge Trail, 1.5
51 Ruffed Grouse Trail, 1.0
52 Sandy Trail, 0.6
53 Sheep Mountain Road, 1.6
54 Shelter Rock Trail, 0.6
55 Shoal Creek Trail, 1.0
56 Shoals Creek Trail, 1.0
57 Stone Mountain Trail, 1.0
58 Switchback Trail, 0.6
59 Table Rock Trail, 0.9
60 Tarkiln Branch Road, 1.4
61 Thomas Cemetery Road, 1.6
62 Three Lakes Trail, 1.9
63 Triple Falls Trail, 0.4
64 Turkey Knob Trail, 4.5
65 Twin Oaks Trail, 0.9
66 Twixt Trail, 0.4
67 Wilkie Trail, 3.7
68 Wintergreen Falls Trail, 0.5
69 Kids Bike Loop, 0.4
70 Donut Hole High Falls Connect, 0.2
71 Jim Branch to Hooker Creek, 1.1
72 Ruffed Grouse to Boundary, 0.5
73 S. Parcel Through Trail, 3.3
73 S. Parcel Through Trail, 1.1
74 S. Parcel West Loop, 1.9
75 S. Parcel East Loop, 2.6

Scale: 1:15,000
0 0.5 1 mi
0 1,500 3,000 6,000 ft

Figure 7-6: Potential Regional Trail Connector Points

Fifteen-Year Budget Plan

8 Fifteen-Year Budget Plan

This Master Recreation Plan has identified the improvements to implement over the next fifteen years. Following is a cost summary for improvements in the short term (1-5 years), mid-term (6-10 years) and long-term (11-15 years). Note that all estimates included in this section are estimates and should not be used to estimate construction costs. Fees including contingency due to the remoteness of DuPont State Recreational Forest (DSRF) have not been applied. It is recommended that annual inflation rates be applied when planning efforts for each line item begin.

Short Term Budget Summary

$9,111,516.46
Total costs for the short term improvements made over the next five years, or years ending 2025 through 2029. DSRF undergoes an annual capital improvements budget process. The last General Capitals Plans and Current Capital Projects Plan were completed in 2024.

$4,375,000
Total expected assets held by the Forest for project funding over the next five years through 2029.

$4,736,516.46
The remaining unbudgeted costs for identified improvements.

$12,000,000
Potential grant application funds in both Building Resilient Infrastructure and Communities (BRIC) Grant Program and Environmental and Climate Justice Community Change Grants Program. If the Forest receives the full amounts in both grant rounds the unbudgeted remaining costs for short term improvement over the next five years is $0.

15-Year Opinion of Probable Cost

	SHORT TERM 1-5 years	MID TERM 6-10 years	LONG TERM 11-15 years
Deferred & Annual Trail Maintenance and Upgrades to Existing Recreational Infrastructure*	$3,895,105.14	TBD	TBD
Conduct Deferred & Annual Road Maintenance*	$267,961.80	TBD	TBD
ADA Accessibility Signage Improvements & Information Sharing	$22,000	$22,000	$7,000
Improve Trail Signage & Signage Maintenance	$22,000	$22,000	$7,000
Improve Existing Educational Signage & Additional Signage	$22,000	$22,000	$7,000
Public Access to Cascade Lake Tract (minimal development)	N/A	N/A	$50,000
One Full-Time Staff for Public Access to Cascade Lake Tract (operations & management)	N/A	N/A	$400,000
Public Access to Continental Divide Tract (planning & development)	N/A	$30,000	$250,000
One Full-Time Staff for Public Access to Continental Divide Tract (operations & management)	N/A	N/A	$400,000
Lake DERA Day-Use Area (planning & development)	$3,174,775	$3,132,000	$372,650
Four Total Full-Time Staff for Lake DERA Day-Use Area (operations & management)	$800,000	$1,600,000	$1,600,000
Regional Trail Connector Trails (planning & construction)	N/A	$30,000	$250,000
One Full-Time Staff for Regional Trail Connections (operations & management)	N/A	N/A	$400,000
Two Full-Time Staff for Recreational Focus (operations & management)	$800,000	$800,000	$800,000
One Full-Time Staff Position for Volunteer Management	N/A	$400,000	$400,000
New Trail Management Objectives Signage	$22,000	$7,000	$7,000
Recommended Trail Closures	$63,674.52	$63,674.52	
Recommended New Trails & Extensions (planning & development)	N/A	$643,406.72	$643,406.72
Signage & Information Sharing on Emerging Trends (special focus on electronic mountain bikes)	$22,000	$7,000	$7,000
Two Full-Time Staff for Social Media Management	N/A	$800,000	$800,000
One Full-Time Staff for Grant Research & Management	N/A	$400,000	$400,000
TOTAL	**$9,111,516.46**	**$7,979,081.24**	**$6,801,056.72**

* As maintenance occurs in each term, costs for deferred maintenance will decrease in subsequent terms

Recommendations

9 Recommendations

The purpose of this study is to objectively review the existing infrastructure, management strategies and recreational facilities and programs offered to the users of DuPont State Recreational Forest (DSRF) to develop a master plan that proposes actions to positively impact DSRF's sustainability. The Forest's natural assets such as the waterfall corridor and extensive multi-use trail system provide recreation opportunities that are important to the economy, ecology and societal health of the surrounding region. The Master Recreation Plan proposes recommendations that support environmental, social and economic health of both DSRF and the surrounding region. The overall goal of this plan is to provide recommendations that will enhance recreational experiences for present and future users over the next fifteen years and beyond while sustaining the Forest from an environmental, financial and social standpoint. It is in consideration of this overall goal that the following recommendations are offered.

The recommendations in this section have been made for both existing facilities and management strategies and the development of new facilities and management strategies. The recommendations are for both physical and nonphysical improvements such as management, organization, operations and maintenance. The following recommendations are listed in general order of priority, but it should be a goal of the DSRF that they be implemented over the next fifteen years. *See Section 6.3 — Prioritization of Needs for more detailed information regarding recommended actions to be implemented in the short, medium and long term.*

9.1 Existing & Future Facilities

Recommendation #1: Prioritize Deferred Maintenance

The assessment of the DSRF's recreational infrastructure assessed that approximately 74% of the trail system requires significant, frequent and professional maintenance. Additionally, the plan has identified new trails to be established, as well as changes to trail management. This represents a tremendous amount of planning, funding, volunteer contributions and administrative labor that must be committed to maintain the current state of the trail network and should be prioritized over new initiatives that are described in some of the subsequent recommendations of this plan.

DSRF should prioritize the several high-impact areas such as the waterfall corridor that receives nearly one million visits per year and is an important economic driver for tourism in the region. Seeking sustainable approaches for such areas will be expensive, time-consuming and should be a priority for the Forest's allocation of time and resources. The upgrades and necessary hardened infrastructure ("forever fixes") to the waterfall corridor are critical for the long-term health and safety of the visitor experience as well as preserving the character and ecological integrity of the unique and protected habitats. On the following page are common streamlining approaches that DSRF could potentially utilize for professional engagements.

TRAIL MAINTENANCE MASTER PLANNING

1. Hire a consultant to provide:
   - A complete maintenance review of the highest need trails outside of the waterfall corridor.
   - A complete plan for the waterfall corridor.
2. Consider and accommodate the longer lead times required with this approach when forecasting annual budgets.
3. Decisions around project development can also be made at this stage

Design / Bid / Build	Either use of a maintenance master plan, waterfall corridor plan or a smaller planning effort to create a scope of work for a Request for Proposal (RFP)
	Allows for open ended lead times and for more long-term budgeting and resource planning
	This format is best suited for trail projects developing trails with longer lead times, of standard types, or in situations where an award has to be based on low price or via a hard price sealed bid process
	The owner/land manager takes on a larger share of the risk for a quality project as they are approving the design and thus the potential quality of the future trail without input from the builder
	Most recommended for DSRF maintenance and new trail additions
Design / Build	This format is better suited for trail projects with accelerated timelines, those desiring unique trials, or those projects requiring creativity/problem solving
	This format works well for complex and creative trail projects resulting in new and innovative trail styles
	The contractor assumes more risk for the successful completion of the project with this format
	Clear project objectives and a concept plan are critical prerequisites for a successful Design/Build
	Recommended for single trail projects only at DSRF
Design / Bid / Build / Project Managed	An outside project manager can be hired to manage multiple concurrent trail projects at once which takes the strain off of DSRF staff by having only one person to liaison with and provides an opportunity to contract with several trail companies at once creating more impact in a smaller window
	Can provide better project oversight and more streamlined coordination with DSRF staff, professional crews and volunteer crews
	Recommended for DSRF if they are able to procure large grants or capital improvement line items

Recommendation #2: Americans with Disabilities Act (ADA) Accessibility Opportunities

Responses from surveys and input sessions suggested the need for greater accessible opportunities as well as improved public information about current accessible recreational opportunities within DSRF. Most public participants stated that they were unaware if the Forest provided ADA-accessible options or opportunities, such as the existing permit system to drive a vehicle to areas near High Falls. This response shows that both information sharing and increased ADA recreational opportunities can be improved.

Additionally, the Forest will benefit from enhanced accessibility as it has the potential to provide safe experiences for users who require or benefit from increased ADA accessibility. This will result in the increased diversity of users within the Forest. In addition, this recommendation will assist with the public's perception of accessible spaces and points of interest and assist the Forest in the long term in determining the balance between the practicality and affordability of creating ADA conditions in natural areas.

Recommendation #3: Upgrades to Existing Recreational Infrastructure

The comparison of trail infrastructure to that of regional national parks provided a key insight into the need for hardened infrastructure. With areas, such as the waterfall corridor, receiving an extremely high number of visits the existing conditions of the trails reflect that high level of use. The current trails in this and other areas throughout the Forest are not adequately constructed to handle this level of use. To ensure future environmental, social and economic sustainability it is recommended that the Forest focus investment on hardened and more sustainable trail building and maintenance practices that will provide long-term solutions. This is a significant capital investment that will be necessary for the long-term sustainability of the Forest. For example, the high use and recurring safety issues around Triple Falls and High Falls would greatly benefit from hardened and more sustainable trail maintenance and building. It is recommended that the Forest prioritizes the allocation of necessary funding for the implementation of hardened sustainable infrastructure at existing high-use trails. These long-term solutions will minimize staff efforts related to maintenance and greatly improve the Forest's sustainability.

Recommendation #4: Upgrades to Educational Materials

Issues related to user conflicts, trail etiquette and environmentally conscious behavior were consistently brought to the planning team's attention during input sessions and focus group interviews. During the planning process, it was noted that signage addressing these concerns already exists at each access area and several trail and road intersections. However, the planning team recommends improving the existing signage throughout the Forest. These improvements should encompass and call attention to items such as trail etiquette, leash laws, forest safety and Leave No Trace principles. In addition, the Forest could take a step further and address these items by producing additional educational material that could be shared with the public. These items could include the use of social media or additions to the Forest website to bring attention to safety concerns and appropriate trail behavior; working with non-profit organizations to share online and in-person educational materials; offering workshops focused on respectful Forest use and trail etiquette; uploading etiquette and safety videos to the DSRF website; and training volunteers who can then interact with visitors on trail etiquette and forest behavioral practices. Providing such educational materials will inform the public on how best to utilize the Forest safely and respectfully while reducing conflicts between user groups and reducing the occurrence of injuries.

In addition, subsequent educational signage is recommended to be placed within various areas of the Forest. This signage exists in a few locations throughout the Forest; however, informative signage additions should highlight more aspects of the Forest's environmental, social, cultural, or historic assets. These educational signs will add to the user experience, increase awareness of DSRF assets, gain support for Forest initiatives and increase user investment in the Forest as a whole.

Existing DSRF Educational Signage

Recommendation #5: Expansion of Existing Recreational Infrastructure

It is important to note that until DSRF can reach a sustainable level of maintaining current infrastructure and has implemented the majority of the recommendations described in Section 4 – Trails, only then should the expansion of existing infrastructure be undertaken with additional and adequate personnel and funding resources. The staff required for the development and access to these three properties and potential regional connector trails will need to include additional staff within the maintenance, recreation and law enforcement DSRF departments as well as seasonal staff to manage the very highly impacted areas. Without this additional staff, these areas could not be maintained, meet recreational needs, or promote visitor safety. It is recommended that a total of four staff be hired for the Lake DERA expansion, two staff be hired for the Cascade Lake and Continental Divide area expansion, and one staff be hired if regional trail connection points are created. ***See Section 7—Concept Plans for graphic representations of the recommendations for each conceptual expansion.***

While most survey participants indicated that they are satisfied with the variety of recreational opportunities within DSRF, the Forest could benefit from additional recreational areas and programming. The presence of a wide variety of high-quality recreational opportunities and facilities already exist within the DSRF. With opening access to a portion of the 'Donut Hole' property around Lake DERA, two new properties and adjacent regional trails, the Forest will have the opportunity for new programming and program elements. The addition of these properties and programming could assist with the dispersing of the high concentrations of users within high-use areas.

It is recommended that Lake DERA be eventually opened to the public to become a day-use recreational area. This space could conceptually provide programming such as picnicking, fishing, kayaking, paddle boarding, parking and gathering pavilions. It is also recommended that a walking path be constructed around Lake DERA that meets ADA requirements to provide additional accessibility options.

The two new properties known as the Cascade Lake tract and the Continental Divide tract are recommended to be further reviewed for potential programming. The planning team worked with DSRF staff to determine conceptual programming for these two areas that included items such as a natural heritage area, hunting opportunities, scenic enjoyment and less-developed experience area. At such time that all deferred maintenance has been addressed, it is recommended that a review and assessment of the current conditions occur to identify program options needed within the Forest. When these programs are identified, the Forest should select the final programming elements for the Cascade Lake and Continental Divide tracts. At the time that programming is determined, Forest staff should allocate funds for the development of certain elements and consult the recreation plan for additional trails in the Continental Divide property prior to beginning trail construction. At the time of trail and signage completion, the Forest should then inform the public of the uses for the properties and trail information for the Continental Divide property either through uploading information to their website and/or making a social media or a public announcement. Prior to this announcement, the Forest needs to provide updated maps detailing access areas, points of interest and trails within the areas.

DSRF is located in proximity to potential connections to surrounding regional trails. Within the area, there are five regional trails including the Ecusta Rails-to Trails Trail, Palmetto Trail, Foothills Regional Trail, French Broad River Paddle Trail and the Mountains-to-Sea Regional Trail. If interest is expressed from an organization leading one of these regional trail efforts to connect to DSRF, it is recommended that the Forest should prepare for any expected needs, management requirements, staffing requirements, growth of regional trail organization relationships and additional infrastructure if any regional trail connections become a reality. A regional trail connection could provide additional recreational opportunities for DSRF and regional trail users and provide potential tourism and economic benefits for the surrounding region.

Just over the border in South Carolina, the Palmetto Trail is the closest regional trail to the Forest. It is recommended that the Forest anticipate outreach from the Palmetto Conservation Foundation or the South Carolina Department of Parks, Recreation and Tourism which are both sponsoring the Palmetto Trail construction. In addition, staff should be increased to both operate the increased scope of Forest responsibilities and to plan and construct any additionally required recreational infrastructure.

The planning team wishes to, again, stress the necessity for the Forest to address and implement all needs expressed in Section 4—Trails, prior to any planning or construction of any of these four new conceptual expansions to the existing infrastructure. In addition, the personnel and funding must be allocated to make any of these expansions a reality. Not acquiring these necessary resources would further put additional responsibilities on staff and funds that could not be realistically achieved.

DSRF High-Use Area

9.2 Programming, Organization & Policy Initiatives

Recommendation #1: Addition of Full-Time Recreation Focused Staff

DSRF does not currently have an adequate number of recreation-focused personnel to maintain the trail system and implement the trail-specific recommendations of this plan. The addition of full-time positions to focus on trail management and equipment operations is a critical need for the Forest.

1. The addition of full-time staff will allow for the following needs to be met:
   - Addressing compounding deferred maintenance, resource degradation and critical fixes for visitor safety and resource protection
   - Expanding the current trail and recreational infrastructure called for in this plan
2. It is recommended that two recreation staff positions be created to meet the above needs

Trails-Based Position	Further support and coordinate and lead the expansion of Volunteer Trail Crew efforts
	Spearhead in-house repairs
	Collaborate on trail maintenance efforts and upkeep
	Maintain recreational facilities (including trail signage)
	Assist with meeting the needs of the Master Recreation Plan recommendations and a specific focus on those recommendations included in Section 4—Trails
Equipment-Based Position for Trails	Increase the capacity to address resource degradation and trail maintenance in response to high visitation counts and visitor impacts on trails
	Support the removal of downed trees on trails
	Support needed regular maintenance highlighted in Section 4—Trails of this plan
	Provide equipment support for the trail crew/hand crew highlighted in Section 4—Trails of this plan

To address the trail improvement needs that require professional services highlighted in Section 4—Trails, it is recommended the agency seek an efficient contract awarding process to expand current funding sources, future appropriations and donations. Contracts should be adaptable and streamlined to further reduce implementation timelines to continually reduce deferred maintenance and avoid future trail conditions that require extensive repair and renovation.

DSRF currently has some financial means to repair and renovate the trail system (PARTF) but needs an annual funding source for basic cyclical trail maintenance to handle the recurring wear and tear and high-level of visitors impacts to the trail system. An additional benefit to recurring trail maintenance projects would be the more efficient process when the State Construction Office review of a basic maintenance contract is necessary.

In accordance with Section 4—Trails, DSRF should maintain the local ability to make future decisions about trails and less developed roads that are integral to the trail network. The local decisions would include items such as trail reroutes, permanent closures, or reclassifying user types on a trail. These trail-based decisions should align with the three pillars of sustainability used as guideposts throughout this plan.

Recommendation #2: Increase Trail Maintenance Funding & Expedite Review Procedures

It is recommended that DSRF explore various funding avenues in addition to grants such as partnerships, sponsorships, or crowdfunding to enhance financial stability alongside grant income. Currently, DSRF's main source of funds comes from the Parks and Recreation Trust Fund (PRTF). Unfortunately, this fund often does not cover the costs of routine maintenance. Since DSRF is in a constant cycle of trail maintenance and repair they are unable to allocate these funds towards these objectives. It is recommended that DSRF receive a maintenance budget for trails of $225,000 annually. This will accommodate five miles of trail maintenance annually at an average rate of $45,000 per mile. It is also recommended that a streamlined process be put in place that allows DSRF to create trail contracts for primarily maintenance-based work without extensive design review. These contracts would just focus on maintenance needs and would exclude the construction of features such as retaining walls or bridges. Although design reviews of this nature are beneficial, they also significantly slow down the process of applying funds to many small capital improvements and routine maintenance that would be performed by professional trail builders. Unfortunately, this slowdown results in funds not being utilized and maintenance issues impacting visitors and natural systems. Lastly, if the state of North Carolina adapts miniature budget cycle the North Carolina Forest Service will need to put in requests starting February 2025. This budget cycle will allow for the Forest to submit a continual series of requests for items such as maintenance and other capital projects.

Recommendation #3: Continue with Natural Area Protection Efforts

Several other recommendations in the plan are focused on recreational opportunity improvements, however, these recommendations allow for opportunities for forest enhancement, wildlife management and natural resource protection. An example of this is the closing of trails to reduce user interactions with sensitive wildlife habitats. It is recommended that the Forest prioritize natural area protection and use this prioritization as the primary base for the decision-making process for all recreational development. This prioritization should be sustained during times of high external pressures to ensure environmentally unsustainable proposals are not pursued.

Recommendation #4: Greater Utilization & Partnerships with Volunteer Organization

There are several user groups that utilize the Forest that have and continue to provide volunteer labor and expertise. The primary volunteer partner is the Friends of DuPont Forest, who demonstrate their support through activities such as trail maintenance crews, non-native and invasive plant control and trash collection events. Volunteers can be beneficial in many different ways within the Forest; however, it is recommended that when volunteers are utilized for trail work they should be properly trained and a pool of volunteers be established so that trail work can be completed in an efficient and timely manner (See Section 4—Trails). The use of volunteers provides several benefits for the Forest such as the creation of a sense of ownership and engagement, reduction in maintenance costs and educational opportunities. However, volunteer physical labor requires various levels of training and supervision to complete effective trail maintenance, can result in liability concerns and has limitations with volunteers' time constraints.

RECOMMENDATION #4 CONTINUED

It is recommended that the Forest continue building the partnerships already established between these volunteer organizations as well as expand their relationship network to form a larger group of volunteers to assist with Forest needs and trail maintenance. It is evident that those who use the Forest love the Forest. Users are aware of the maintenance concerns and constraints, and many would be happy to volunteer their time as they are able.

Recommendation #5: Communicating New Trail Management Objectives

Introducing new trail management practices to the public requires a thoughtful and comprehensive communication strategy to ensure understanding, acceptance and compliance. See Section 4—Trails for a list of actions that are recommended to be taken to ensure the objectives are communicated efficiently and that input from the public is considered. Section 4 also details recommended approaches regarding the management of directional and designated trails.

Recommendation #6: Commit to a System-Wide Implementation of Trail Recommendations

Due to the high volume of visits to DSRF and how this volume is dispersed to various trails within the Forest, it is apparent that the majority of trails require medium or high levels of maintenance. During the planning process, it was also determined that some trails would function better if categorized as either directional and/or assigned designation. In Section 4—Trails of this plan the recommended management practices are laid out to identify the best steps towards either trail designation, direction, closure, or addition. It is important to note that all recommendations are considered a cohesive whole. Adapting only a few of these recommendations will result in limited improvement to trail sustainability across the whole of DSRF. Incorporating all the recommended maintenance and management practices can give DSRF the greatest opportunity to improve trail system sustainability within the Forest.

Recommendation #7: Management of Emerging Recreational Trends

Throughout the planning process, the subject of electronic mountain bikes (eMTBs) became a topic of discussion during public input sessions, surveys and focus group interviews. The planning team worked with the Forest to review the management practices of other national and state parks and forests to determine what management strategies would be best for DSRF. In Section 4—Trails the plan walks through the trends of eMTBs, classes of eMTBs, state and federal laws regarding eMTBs, eMTBs implications for land managers, other Power-Driven Mobility Devices (OPDMDs), other electric recreation devices, other emerging trends and provides recommendations specific to DSRF.

The planning team recommends that no management changes be made within DSRF regarding eMTBs and to keep eMTB use on perimeter roads that are controlled by the North Carolina Department of Transportation. In addition, access should continue for all OPDMD use which is required under the federal Americans with Disabilities Act (ADA). These recommendations are based on both public feedback, the necessary legislative action required to allow eMTBs on state forest lands and the federal ADA requirements. To improve communication and compliance regarding Forest regulations on the use of eMTBs it is recommended that DSRF focus on public awareness and education. This can be achieved through:

- Additional Signage: Install more signs specifically about eMTB legislation
- Partnerships: Collaborate with non-profit organizations to help spread awareness
- Outreach and Educational Programs: Implement programs to educate visitors on the restriction of eMTBs within the Forest

Should North Carolina law change in the future to allow eMTBs on forest land, it is advisable for the Forest to undergo a review process to assess the compatibility of eMTBs with current Forest uses.

Recommendation #8: Improvements for Social Media Management

Most users responded that they typically get information about the Forest either through word of mouth, social media or the DSRF website. To improve channels of information, build a sense of community and support a consistent brand voice it is recommended that DSRF manage its social media channels in-house. This action can bring about several benefits and changes to how the Forest engages with users and shares information. Below is a list of key changes that would need to occur to improve the implementation of DSRF's social media.

IMPROVEMENTS TO IN-HOUSE SOCIAL MEDIA MANAGEMENT

Direct Engagement: Managing social media in-house allows for direct engagement with followers, providing timely responses to queries, comments and messages. For example, when the Forest Service needs to close a trail due to rain or safety concerns, they typically must wait for the State to post this announcement and rely on other groups or organizations to share the update. If social media was controlled in-house this would create a more efficient form of communication and prevent potential trail damage or user injury.

Content Control: The Forest can have full control over the content posted, ensuring alignment with messaging, branding and communication objectives.

Real-Time Updates: In-house management enables immediate updates on trail conditions, events, closures and safety alerts, enhancing visitor experience and safety.

Community Building: By engaging with followers, sharing user-generated content and fostering a sense of community, DuPont State Recreation Forest can strengthen relationships with visitors and stakeholders.

Brand Voice Consistency: Maintaining social media in-house ensures consistent brand voice, messaging and storytelling across platforms, reinforcing the Forest's identity.

Data Insights: Analyzing social media metrics and insights internally provides valuable data for understanding audience preferences, content performance and engagement trends.

ENHANCEMENT OF SOCIAL MEDIA STRATEGIES

Content Calendar: Develop a content calendar to plan and schedule posts in advance, ensuring a consistent and strategic approach to content sharing.

Visual Storytelling: Utilize visual content such as videos, photos and infographics to showcase the beauty of the forest, trails and recreational activities.

Engagement Strategies: Implement interactive features like polls, Q&A sessions and contests to boost engagement and encourage user participation.

Educational Campaigns: Launch educational campaigns on conservation, trail etiquette, wildlife awareness and environmental stewardship to promote responsible visitation.

RECOMMENDATION #8 CONTINUED

By taking control of their social media channels, DSRF can enhance their online presence, strengthen community connections and effectively communicate with their user audience. These benefits will ultimately promote responsible visitation, environmental conservation and a positive visitor experience.

By utilizing a combination of these social media improvements, strategies, objectives and channels the DSRF can reach a diverse audience, share compelling content, promote sustainable outdoor recreational practices, foster a sense of community and provide real-time updates to new and consistent users. Due to current staff workloads, it is recommended that dedicated staff be hired to conduct public relations tasks. This staff member would focus their work on social media management, public outreach, marketing efforts, permit applications and public engagement. See Section 8—Five-Year Budget for more detailed information regarding necessary funds for new staff.

Recommendation #9: Implementation of Grant Research & Application

Grant allocation can assist in obtaining the funding for trail maintenance, professional trail services and help alleviate the strain on State received funds to ensure DSRF's environmental, social and economic sustainability. It is recommended that DSRF obtain a consistent update of the funding landscape, create open and constant communication on priorities and pursuits for future funding and create a checklist to determine the applicability of grants for funding to achieve Forest goals. The Forest should also begin discussions regarding either hiring additional staff specifically for grant research and application or finding additional funds to outsource this process when grants are to be pursued.

Below is a list of recommended actions that could assist in the Forest's grant research and application process.

Streamline Grant Research: Develop a structured research approach to explore diverse grant opportunities aligning with the Forest maintenance and development goals while allowing for additional time for thorough investigations.

Establish Grant Writing Workshops: Organize workshops to train the DSRF team in crafting compelling grant proposals. Provide tools like guidelines and templates for effective writing.

Enhance Network Efforts: Strengthen relationships with grant providers, local businesses and community stakeholders to improve grant acquisition chances. Active participation in relevant industry events is encouraged.

Track Grant Application Progress: Deploy a tracking system to monitor application progress efficiently. Reminders for deadlines and reporting requirements are essential for timely submissions.

Evaluate Success Metrics: Establish clear metrics to assess grant application success. Analyze feedback from unsuccessful applications to refine future proposals and increase funding chances.

RECOMMENDATION #9 CONTINUED

If the Forest pursues outsourcing the grant research and application process by hiring a grant team for a funding strategy it is recommended that the below items should become areas of focus during the hiring process.

Expertise and Experience: Look for individuals with relevant grant writing, research and management experience. Seek team members with a successful track record in securing grants.

Diverse Skill Set: Build a grant team with varied skills in writing, budgeting, project management and communication. Consider including individuals experienced in community engagement and stakeholder relations.

Collaborative Approach: Prioritize teamwork and effective communication within the grant team for idea exchange and decision-making facilitation.

Continuous Learning: Provide preference for individuals committed to staying updated on grant trends and best practices. Encourage professional development to enhance team skills and knowledge.

Resourceful and Proactive: Seek proactive team members who actively seek new funding opportunities and are creative in developing funding strategies.

Project Management Skills: Ensure the team possesses strong project management skills to handle multiple grant applications effectively. Implement tools for streamlined grant management workflows.

Result-Oriented: Establish measurable goals and indicators for tracking progress. Encourage a results-driven approach towards grant writing acquisitions.

By adhering to these recommendations, a proficient grant team can be assembled and well-equipped to execute a successful funding strategy supporting the organization's objectives effectively.

Recommendation #10: Benchmarking

Benchmarking is a tool recommended by the National Parks and Recreation Association (NPRA). Benchmarking sets standards for the achievement of basic organizational structures for parks and forests and organizes those standards into different levels of tier certifications. It is an excellent tool for communities to use in self-evaluation of the structure of their organization and the delivery of recreation services. The NPRA also maintains a national benchmarking database for local jurisdictions to compare their standards and practices against those jurisdictions of similar size and population across each state and the nation. The link to begin the self-evaluation and enter data is available on the NPRA website. Being involved with the NPRA would provide DSRF with benefits such as providing research and resources to assist with the support of organizational programs or objectives; access to park metrics through a GIS database tool that provides insight into benchmarking, best practices and planning; access to an online field guide that provides information for suppliers related to the parks and recreation industry; and access to updated information on available grants supported by NRPA.

Conclusion

All recommendations, including existing facilities, new facilities and opportunities, managerial, organizational, operational and maintenance should be a goal of DSRF. It is strongly encouraged that each recommendation be developed or implemented for DSRF over the next fifteen (15) years. ***See Section 6.3—Prioritization of Needs to get more detailed information regarding recommended actions to be implemented in the short, medium and long term.***

Sources

10 Sources

1. North Carolina Forest Service
2. www.cdc.gov
3. ncstatepark.wordpress.com
4. www.exploreasheville.com
5. www.citizen-times.com
6. www.dupontstaterecreationalforest.com
7. www.library.transylvaniacounty.org
8. www.nrpa.org
9. N.C. Senate Bill 105-2021 Appropriations Act
10. www.dupontforest.com
11. www.hendersonvillebest.com
12. www.outdoorindustry.org
13. www.datausa.io
14. DuPont State Recreational Forest Annual Legislative Report (2023)
15. www.scfc.gov
16. www.ecustatrail.org
17. www.palmettoconservation.org
18. www.sctrails.net
19. www.frenchbroadpaddle.com
20. www.mountainstoseatrail.org
21. www.blueridgenow.com
22. www.conservingcarolina.org
23. www.ada.gov
24. North Carolina Forest Service Annual Legislative Report on DuPont State Recreational Forest: Fiscal Year 2021-2022
25. www.ncparks.gov
26. The Future of eMTB on Public Lands: How to Effectively Manage a Growing Trend—U.S. Department of Transportation Federal Highway Administration
27. www.mordorintelligence.com
28. www.cccmb.org
29. www.freehub.com
30. www.nps.gov
31. www.gastongazette.com
32. www.northcarolinastateareas.com
33. www.transylvaniatimes.com