Great Smoky Mountains National Park

U.S. Department of the Interior
National Park Service

Wears Valley Mountain Bike Trail System
Revised Environmental Assessment

February 2022

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The National Park Service (NPS) is considering the development of a mountain bike trail system within the transportation corridor for Section 8D of the Foothills Parkway. The purpose of the proposed project is to enhance visitor experience by providing new recreational opportunities within the Wears Valley portion of Foothills Parkway Section 8D.

NPS prepared an environmental assessment (EA), published for public comment in October 2020, to evaluate alternatives for enhancing recreation through a mountain bike trail system within the Wears Valley portion of the Great Smoky Mountains National Park (the Park). The EA describes the environment that would be affected by the alternatives and assesses the potential environmental consequences of implementing the alternatives. It examines three action alternatives and one no action alternative. During the public comment period, NPS received a comment regarding the potential effects of the proposed mountain bike trail system on karst resources. As a result, a dedicated study to identify karst features in the project area was undertaken in 2021 to evaluate the potential effects on these resources in this Revised Environmental Assessment (Revised EA).

In the October 2020 EA, NPS anticipated promulgating a special regulation that would designate the proposed Wears Valley Mountain Bike Trail System as a bicycle route pursuant to 36 Code of Federal Regulations (CFR) 4.30 (e)(2) – Bicycles (the Bike Rule). However, NPS has since determined that because the proposed bike trail system would be entirely located in an area of the Foothills Parkway corridor that is zoned for development in the Park's *General Management Plan* (NPS 1982), 36 CFR 4.30(e)(2) does not apply, and a special regulation is not required. Instead, a Superintendent's written determination, rather than a special regulation, is required to comply with the Bike Rule. The applicable regulatory framework to authorize bicycle use on the new trail system is found in 36 CFR 4.30(e)(1). Paragraph (e)(1) requires that, after completion of the National Environmental Policy Act (NEPA) process and prior to constructing, developing, or authorizing bicycle use on new trails, the Superintendent must complete a written determination that bicycle use on the new trail system is consistent with the protection of the park's natural, scenic, and aesthetic values; safety considerations; and management objectives; and will not disturb wildlife or park resources. As required by NPS regulations, notice of the written determination will be published in the *Federal Register* for a 30-day public review period after the completion of the NEPA process. The Regional Director's written approval of the determination must subsequently be obtained.

In summary, this Revised EA includes two changes relative to the October 2020 EA:

1. It provides a more detailed analysis of potential effects of the proposed mountain bike trail system on karst resources based on a site-specific karst assessment completed in 2021.
2. It documents that a special regulation is not needed to designate the proposed trail system as a bicycle route.

This document has been prepared in accordance with NEPA of 1969, as amended; regulations of the Council on Environmental Quality (40 Code of Federal Regulations 1500–1508) (CEQ 1978); and NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2011) and NPS *NEPA Handbook* (2015).

For Further Information Contact:

Superintendent
Great Smoky Mountains National Park
107 Park Headquarters Road
Gatlinburg, TN 37738

Note to Reviewers and Respondents:

If you wish to comment on the new components of this Revised EA, you may post comments electronically at http://parkplanning.nps.gov/WearsValleyBikeTrails (NPS preferred method). You may also mail comments to the address above. Comments must be received within 30 days of the release of the Revised EA. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that under provisions of the Freedom of Information Act the entire comment, including your personal identifying information, may be made publicly available at any time. Although you can ask in your comment to withhold your personal identifying information from public review, NPS cannot guarantee that it would have the legal authority to do so.

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CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

The National Park Service (NPS) prepared an environmental assessment (EA) for a mountain bike trail system in a portion of an unfinished section of the Foothills Parkway (Parkway) in accordance with the National Environmental Policy Act (NEPA). The EA was published for public comment in October 2020. The Parkway is part of Great Smoky Mountains National Park. Collectively the Foothills Parkway and Great Smoky Mountains National Park are referred to as "the Park" in this document.

At this time, NPS is preparing this Revised Environmental Assessment (Revised EA) to address public comments received during the 2020 EA public comment period related to the potential for impacts on karst resources. As a result of public comments, a dedicated study to identify karst features in the project area was undertaken in 2021 (NPS 2022) to evaluate the potential effects on karst resources in detail in this Revised EA.

In the October 2020 EA, NPS anticipated promulgating a special regulation that would designate the proposed Wears Valley Mountain Bike Trail System as a bicycle route pursuant to 36 Code of Federal Regulations (CFR) 4.30 (e)(2). However, NPS has since determined that because the proposed bike trail system would be entirely located in an area of the Parkway corridor that is zoned for development in the Park's *General Management Plan* (NPS 1982), 36 CFR 4.30(e)(2) does not apply and a special regulation is not required. Instead, a Superintendent's written determination, rather than a special regulation, is required to comply with the Bike Rule. The applicable regulatory framework to authorize bicycle use on the new trail system is found in 36 CFR 4.30(e)(1). Paragraph (e)(1) requires that, after completion of the NEPA process and prior to constructing, developing, or authorizing bicycle use on new trails, the Superintendent must complete a written determination that bicycle use on the new trail system is consistent with the protection of the park's natural, scenic, and aesthetic values; safety considerations; and management objectives; and will not disturb wildlife or park resources. As required by NPS regulations, notice of the written determination will be published in the *Federal Register* for a 30-day public review period after the completion of the NEPA process. The Regional Director's written approval of the determination must subsequently be obtained.

Both the October 2020 EA and this Revised EA were completed in accordance with the Council on Environmental Quality (CEQ) NEPA regulations prior to CEQ's Final Rule for the Update to the Regulations Implementing the Procedural Provisions in the National Environmental Policy Act, which became effective September 14, 2020. NEPA documents already in progress are authorized to complete NEPA compliance consistent with the previously existing regulations. Because this EA is a revision of the previous EA for the Wears Valley Mountain Bike Trail System, it follows the previous CEQ NEPA implementing regulations (1978), rather than the 2020 CEQ implementing regulations.

PURPOSE OF THE ACTION

The purpose of the proposed action is to enhance visitor experience by providing new recreational opportunities within the Wears Valley portion of Parkway Section 8D. Specific objectives for the proposed action include:

- Providing recreational development that is consistent with the purpose of the Parkway and compatible with future completion of the Parkway as envisioned by Congress.
- Providing Park visitors unique opportunities to enjoy the Parkway outside motor vehicles.

- Increasing the diversity of recreational experiences, including non-motorized opportunities, available to Park visitors.

NEED FOR THE ACTION

The proposed action is needed to take advantage of new and unique recreational opportunities that exist within the Wears Valley portion of Parkway Section 8D. Previous NPS planning efforts completed between 1968 and 1984 (see appendix A for a summary of previous planning efforts) indicate that the Wears Valley portion of Section 8D should be one of the most highly developed along the Parkway based on its central location and other factors. Build-out of these concepts has not been achieved for a variety of reasons, including because Section 8E of the Parkway, which connects to the northern end of Section 8D was only recently completed and opened to the public in 2018.

Completion of the 8E milestone enabled Park managers to reinitiate recreational planning efforts for the Wears Valley portion of Section 8D. Additionally, community interest in exploring new recreational opportunities along the Parkway has increased in recent years. At the request of stakeholders, Park managers participated in three meetings from October 2018 through October 2019 with elected officials, community leaders, and a non-governmental organization to discuss potential recreational opportunities along the Parkway. Based on previous planning efforts, recent completion of Section 8E, and stakeholder interest, the Park determined it would be appropriate to reinitiate recreational planning efforts for the Wears Valley portion of Section 8D. After reviewing previously identified recreational development concepts, the Park identified mountain biking as a potentially compatible opportunity. Mountain biking is an underserved recreational use in the Park and there has been strong community interest in establishing a network of trails specifically designed for mountain bike use.

While more than 800 miles of trails exist in the Park, fewer than 8 miles are designated for biking. Public roads within the Park are open to biking, but no purpose-built mountain biking trails exist. Most of the Park's trails are in areas managed as wilderness where bikes are not permitted. Although no Congressionally designated wilderness presently exists in the Park, 464,544 acres have been formally recommended or proposed as wilderness (NPS 2016). NPS manages recommended and proposed wilderness areas to preserve their wilderness character until Congress decides whether to designate them as wilderness (see *NPS Management Policies* 2006 §6.3.1). The Wears Valley portion of the Parkway could provide visitors new opportunities to experience the Park through mountain biking because it is within the Park's general development zone and transportation management zone (NPS 1982) and is not managed as wilderness. Mountain bike trail development in this area is also consistent with previous planning efforts.,

PROJECT AREA

The project area consists of 425 acres within the Foothills Parkway corridor in Wears Valley, Tennessee. Figure 1 shows the project vicinity, and figure 2 shows the project area.

PARK BACKGROUND

Great Smoky Mountains National Park was created through donations of land early in the 20th century "for the benefit and enjoyment of the people." The 800-square-mile national park unit lies on the Tennessee-North Carolina border and is within a day's drive of 50% of the US population. The Park had 12.5 million recreational visits in 2019, which is about a 25% increase since 2010.

Congress authorized the Parkway in 1944 as a scenic parkway that would provide views into Great Smoky Mountains National Park from a road corridor outside the Park. Of the Congressionally mandated parkways, the Foothills Parkway is the only remaining parkway yet to be completed. When completed,

the Parkway will be a 72-mile-long road traversing the western and northern perimeters of the Park and will extend from Interstate 40 east of Cosby, Tennessee, to its western terminus in Chilhowee, Tennessee. The State of Tennessee acquired the right-of-way for the Parkway and transferred it to the US government. To date, approximately 38.6 miles of the Parkway have been constructed and are open to motor vehicles. In the *Foothills Parkway Master Plan*, the designated route for the Parkway was called "Route 8," and for planning purposes, was divided into a series of sections referred to as Section 8A through 8H (NPS 1968). Sections 8A, 8G, and 8H, totaling approximately 22.5 miles, were completed and opened for public use in the 1960s. In 2018, Sections 8E and 8F, approximately 16.1 miles, were completed. One section that has not been developed is Section 8D (approximately 9.8 miles), the corridor from Wears Valley to the Gatlinburg Spur. The Parkway provides motorists with access to scenic views of the Park, access to recreational activities, and a free-flowing scenic drive.

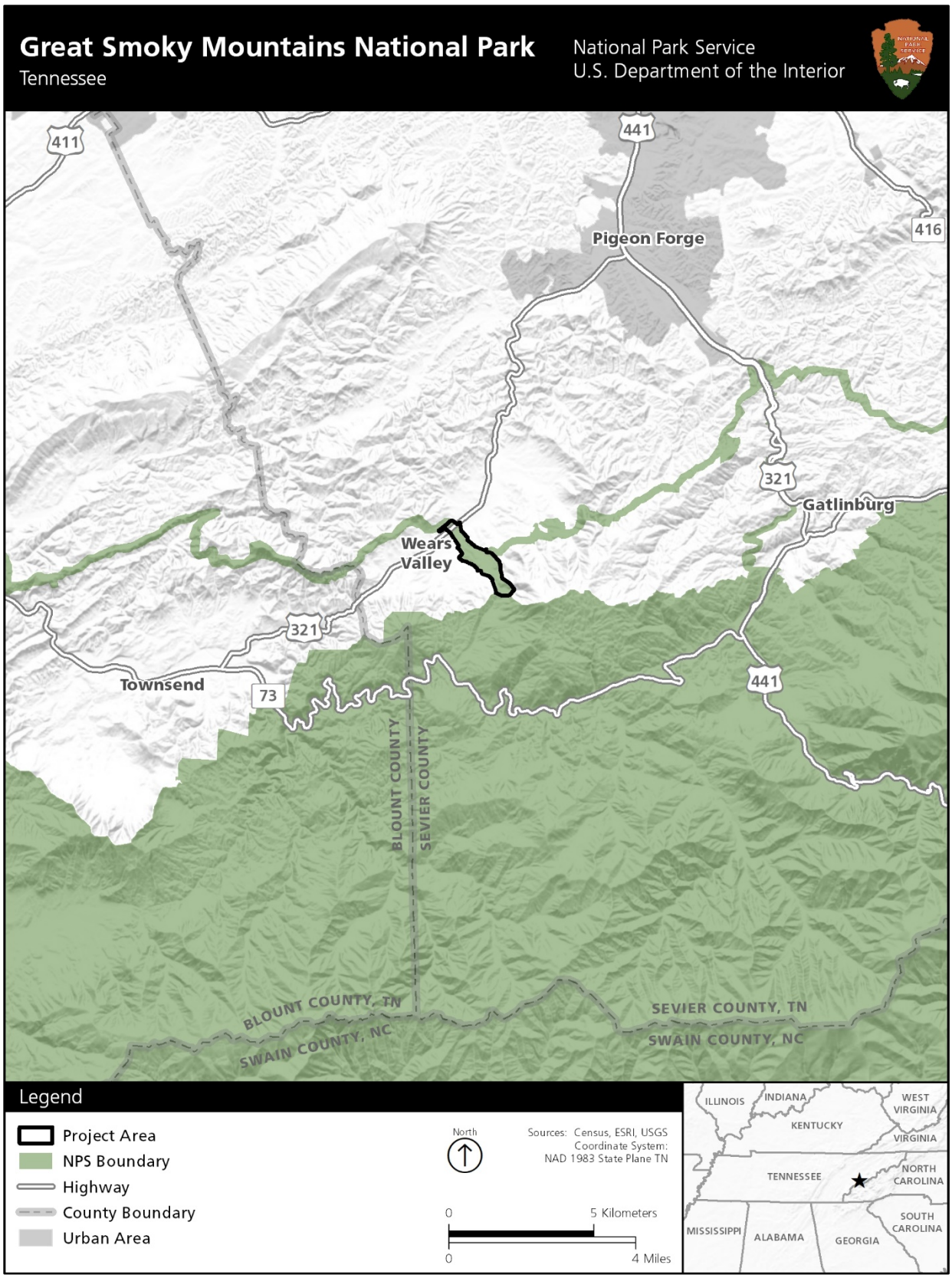


FIGURE 1. PROJECT VICINITY

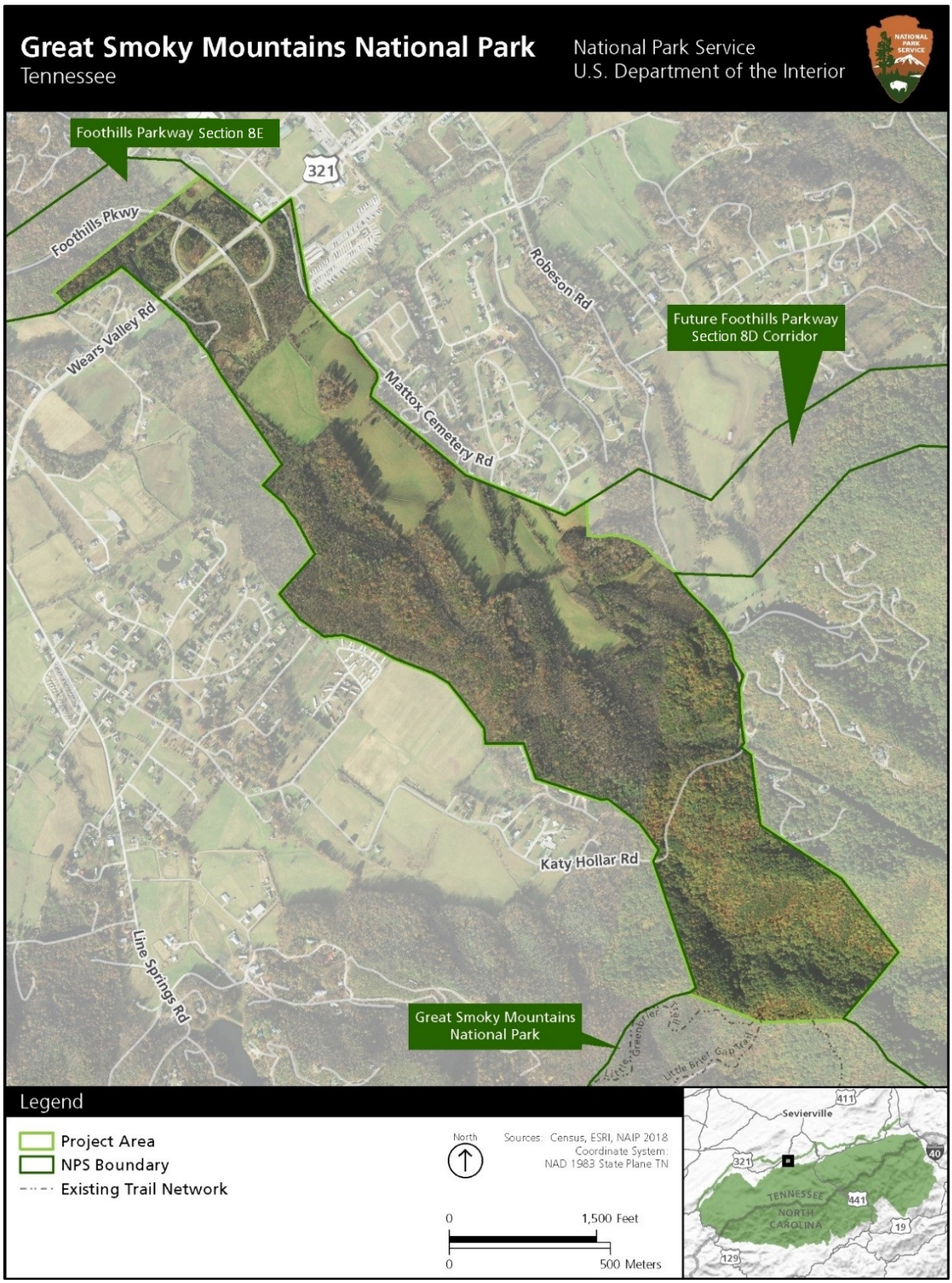


FIGURE 2. PROJECT AREA

RELATIONSHIP TO PREVIOUS PLANNING FOR WEARS VALLEY

As documented in agency policy, planning for NPS units is conducted through a "portfolio planning" approach. Rather than relying on one regularly revised comprehensive document to meet the statutory requirements for park planning, parks may instead meet individual requirements through more targeted planning efforts that focus on specific sites, uses, or resources. These targeted efforts can either provide entirely new guidance or can update existing guidance. This Revised EA is part of the Park's planning portfolio. While the Wears Valley area of the Park has been addressed in previous planning documents, this document specifically revisits the requirement to identify types and general intensities of development (including visitor circulation and transportation patterns, systems, and modes) associated with public enjoyment and use of an area.

As summarized in appendix A, the existing guiding documents in the planning portfolio for Wears Valley include the *Foothills Parkway Master Plan* (1968), the *General Management Plan* for Great Smoky Mountains National Park (1982), and the *Development Concept Plan* for Metcalf Bottoms and Wears Valley (1984). The Parkway has largely been developed consistent with these guiding documents. However, because the Parkway has not been fully constructed, not all actions proposed in previous plans have been implemented to date, particularly development of recreational facilities envisioned in the Wears Valley area. This project provides an opportunity to consider more specific guidance for recreational development in the Wears Valley portion of the Parkway, consistent with longer-term planning documents that call for a high level of development in the area. Further, this Revised EA does not preclude the Park from pursuing additional development options identified elsewhere in the planning portfolio as the Parkway is further constructed.

CHAPTER 2: ALTERNATIVES

NEPA requires federal agencies to explore a range of reasonable alternatives to address the purpose of and need for the proposed action. Reasonable alternatives include alternatives that are "technically and economically practical or feasible and meet the purpose and need of the proposed action" (43 CFR § 46.420(b)). The alternatives under consideration must include a no action alternative as prescribed by the CEQ regulations for implementing NEPA (40 CFR Part 1502.14) (CEQ 1978).

The alternatives analyzed in this document, in accordance with NEPA, are based on the result of internal (NPS), public, and agency scoping. Alternatives and actions that were considered but are not technically or economically feasible, do not meet the purpose of and need for the project, create unnecessary or excessive adverse impacts on resources, or conflict with the overall management of the Park or its resources were dismissed from detailed analysis. These alternatives or alternative elements and their reasons for dismissal are discussed at the end of this chapter. NPS explored and objectively evaluated four alternatives in this Revised EA: the no action alternative and three action alternatives.

NPS completed a visitor use management planning process (appendix B) for the proposed Wears Valley Mountain Bike Trail System as part of the proposed action. Visitor use management is the proactive and adaptive process of planning for and managing visitor use characteristics and their physical and social setting using a variety of strategies and tools to sustain desired resource conditions and visitor experiences. Visitor use management is important because NPS managers strive to maximize visitors' opportunities and benefits while achieving and maintaining desired conditions for resources and visitor experiences in a particular area. This Revised EA uses the visitor use management framework guidance outlined by the Interagency Visitor Use Management Council (IVUMC 2016) to develop a long-term strategy for managing, monitoring, and mitigating potential impacts from visitor use within the proposed Wears Valley Mountain Bike Trail System.

UPDATES TO ACTION ALTERNATIVES SINCE THE 2020 EA

The action alternatives analyzed in this Revised EA remain the same as those analyzed in the 2020 EA except for one minor alignment shift to avoid a potentially sensitive Park resource. This alignment shift was applied to all three action alternatives and does not change the impact area used for analysis. Under alternatives 3 and 4, the pedestrian trail was shortened as a result of this change. Impacts on vegetation and soil disturbance would be reduced by approximately 0.1 acres for these alternatives.

ALTERNATIVE 1: NO ACTION

CEQ defines the no action alternative as the alternative that represents no change from current management, and the analysis of this no action alternative provides a baseline of continuing with the present course of actions (CEQ 1981). Under the no action alternative, there would be no change to the use of the transportation corridor for Section 8D in Wears Valley. Mountain bike trails would not be constructed within the project area, and there would be no support infrastructure, including amenities associated with mountain bike trails, pedestrian trails, or completion of up to 1 mile of Section 8D. A portion of the land in Wears Valley would continue to be used for hay production (approximately 66 acres) under a special use permit.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

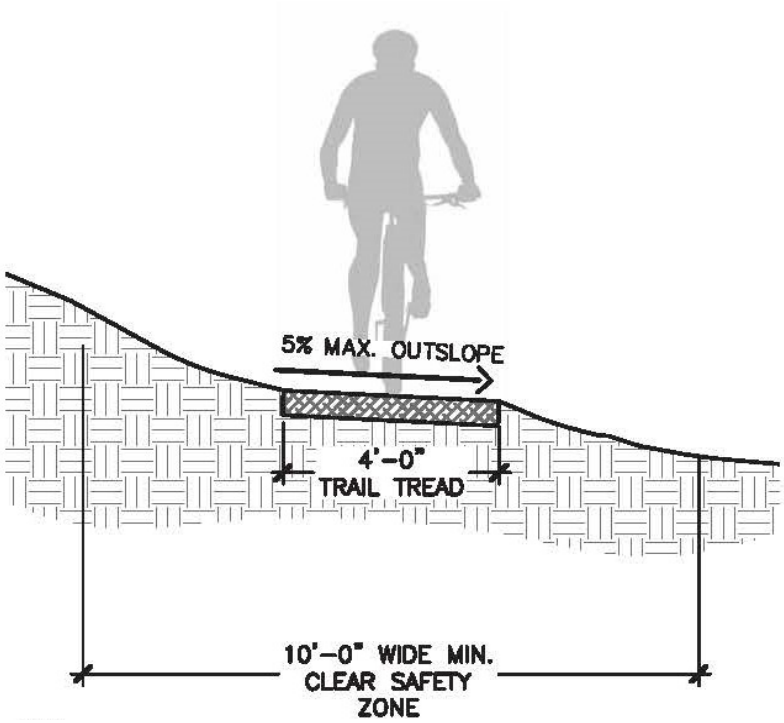
MOUNTAIN BIKE PROGRAM ELEMENTS

All action alternatives include the same program elements, general infrastructure, and amenities. Designated mountain bike trail routes would generally be 100 feet from the Park boundary, including at Little Brier Gap and the Little Greenbrier Trail, to minimize conflicts with neighboring land uses and the potential for spillover into areas where bike use is not authorized, although this distance may be reduced to 50–75 feet in certain areas with limited space. Figures 3 and 4 offer visualizations of the typical trail character in the open field and wooded sections of the project area. A typical cross section for the mountain bike trails is provided in figure 5. Appendix C provides an expanded discussion of the mountain bike trail design strategy and user experience under all action alternatives. Any intersections requiring cross traffic or intermingling of differing user types would be designed with "choke" features to force a reduction of speed. These features would also be paired with adequate signage and the addition of physical structures, when necessary, to visually emphasize where bikes or hikers are not allowed. Providing additional amenities in these locations could further help reduce speeds, serving as a slow-down or stopping point.

Each action alternative would also require construction of a road to access the mountain bike trail system. While the length of the access road varies by action alternative, the access road would be approximately 24-feet wide with 4-foot shoulders and a 15-foot maintained roadside clearance on each side. It would be built along the proposed Parkway Section 8D road alignment, which was identified during previous planning efforts for the Parkway (NPS 1994). The access road would ultimately become part of the overall Parkway, pending completion of future planning, environmental compliance, and decision-making processes for Section 8D. A 318-foot-long bridge would be built over Cove Creek. The access road would also include a wildlife tunnel to allow wildlife such as amphibians, reptiles, and small mammals to continue to travel between the two wetland areas north of Cove Creek on opposite sides of the road.

Amenities at the trailhead(s)/parking area(s) under all action alternatives would include a bike wash and repair station; a comfort station (restrooms) with a subsurface sewage disposal system (i.e., septic system); picnic tables; and an informational kiosk for orientation, trail etiquette, and rules for mountain biking. Alternatives 2 and 3 would include a possible concession/bike rental building. All trailheads could include a fee collection station. All roads, parking areas, signage, and buildings would be consistent with NPS Park Road Standards.

As noted above, two or three buildings would be associated with trailheads under each action alternative. The exact footprint and massing of these buildings would be determined during final design, should an action alternative be selected for implementation. All buildings are included within the disturbance associated with the entire trailhead, and all disturbance associated with each trailhead is assumed to be permanent and impervious surface. All buildings would be limited to one-story and building materials would be consistent with other buildings in the Park. Buildings would likely be a steel or timber frame with a metal roof constructed on slab on grade. The comfort station is assumed to contain four stalls. The concessions/bike rental building considered under alternatives 2 and 3 would contain office and retail space, bike and equipment storage, and an outdoor canopy area for visitors. The estimated dimension of both buildings is based on comparable NPS structures and was used to develop the total trailhead area. The comfort station is estimated to be 23 feet by 30 feet, and the concessions/bike rental space is estimated to be 30 feet by 65 feet, although it is possible the concessions and rental space could be two buildings. Additionally, an estimated number of parking spaces is included under each alternative. If an action alternative is selected for implementation, the number of spaces may change during detailed design. Each alternative analyzes the total acres of disturbance associated with each trailhead, not the specific number and size of buildings or parking spaces.



CONSTRUCTION

Under all action alternatives, the purpose-built mountain bike trails would be approximately 4 feet wide (see figure 5). Sustainable design concepts and construction techniques would be used to quickly eliminate water from the trail system after a rain event, which would reduce erosion, standing water, and long-term trail maintenance needs. The trail system would be constructed to avoid removing large-diameter trees wherever possible. Sustainable design techniques could include grade reversal and the half rule criteria. An example of a grade reversal includes using rollers, where the topography goes up and down (figure 6). At the low point of these areas, the trail forces water to drain off the trail system. Similarly, the half rule slope criteria require that the trail grade be less than half of the side slope it crosses (figure 7). For example, if the existing slope is 20%, the trail would not slope more than 10%; this allows water to flow out of the trail system instead of following the trail alignment and eroding the trail tread. Boardwalks, wooden deck ladder bridges, or boulder causeways would be built at stream or drainage crossings to minimize impacts on the drainage channel (figure 8). After construction is complete, areas of disturbance would be revegetated with native plants.

The width of trail disturbance would vary based on terrain and other factors. For analysis purposes, the limits of disturbance for the mountain bike trails were estimated based on a 4-foot width of disturbance for the easy trails, 6 feet for the moderate trails, and 10 feet for the advanced trails, where switchbacks and cut and fill requirements could disturb a wider area beyond the footprint of the trail. Similarly, for action alternatives with pedestrian trails, the trail width could vary between 3 to 5 feet; an average of 4 feet was used for potential disturbance.

The access road on the north side of Cove Creek and the bridge over Cove Creek would be designed and constructed to minimize impacts on wetlands and floodplains. The access road in this area would follow an existing unpaved, maintained roadbed that was built in the 1980s. Wetlands exist on either side of the existing roadbed. The bridge would span the 100-year floodplain of Cove Creek. The road footprint and

potential impacts on wetlands in this area would be minimized by using relatively steep side slopes, engineered fill, or other structural design elements.

Because the area contains no sanitary sewer lines, subsurface sewage disposal systems (i.e., septic systems) would be required at each trailhead to treat wastewater from the comfort stations. The subsurface sewage disposal systems would be situated near the developed trailheads in open, non-forested areas and outside floodplains and buffers for wetlands, streams, and drainages. Based on the estimated number of bathroom stalls, the septic field would be less than 5,000 square feet, or approximately 0.11 acres. These systems would be sited and designed following Tennessee Code: Title 68 Health, Safety and Environmental Protection: Chapter 221 Water and Sewerage: Part 4 Subsurface Sewage Disposal Systems in consultation with the Tennessee Department of Environment and Conservation (TDEC). Under each alternative, the remaining utilities, which include underground potable water lines and electric lines, would be within the access road corridor and would require no additional ground disturbance.

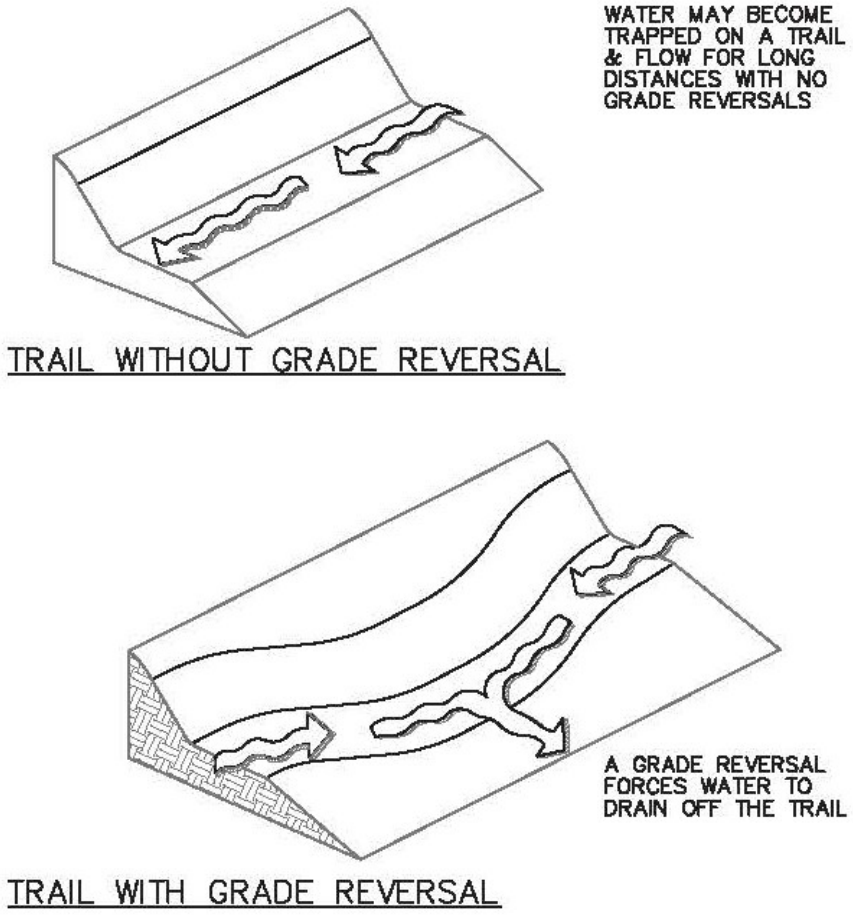


FIGURE 6. GRADE REVERSAL TRAIL DESIGN

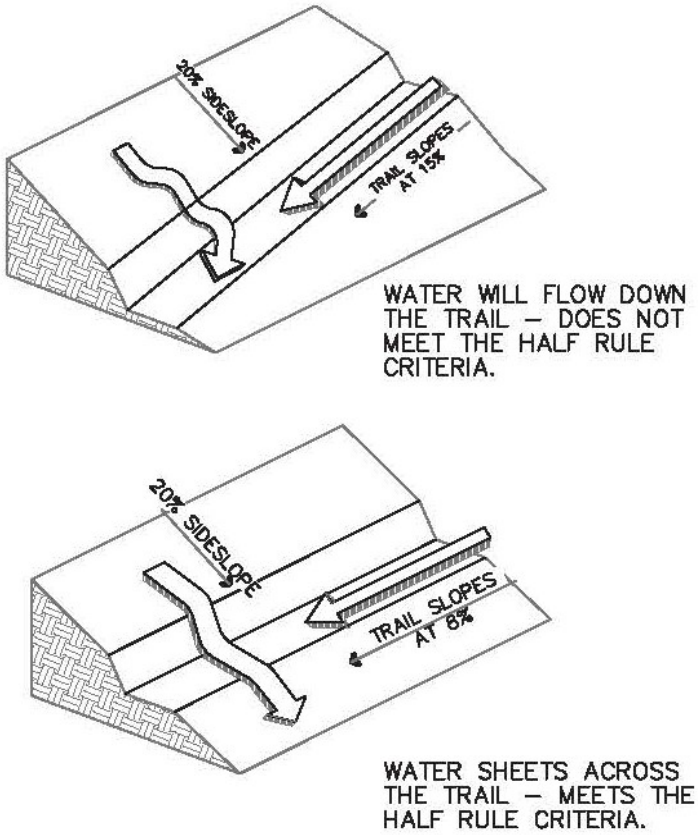


FIGURE 7. HALF SLOPE CRITERIA FOR TRAIL DESIGN

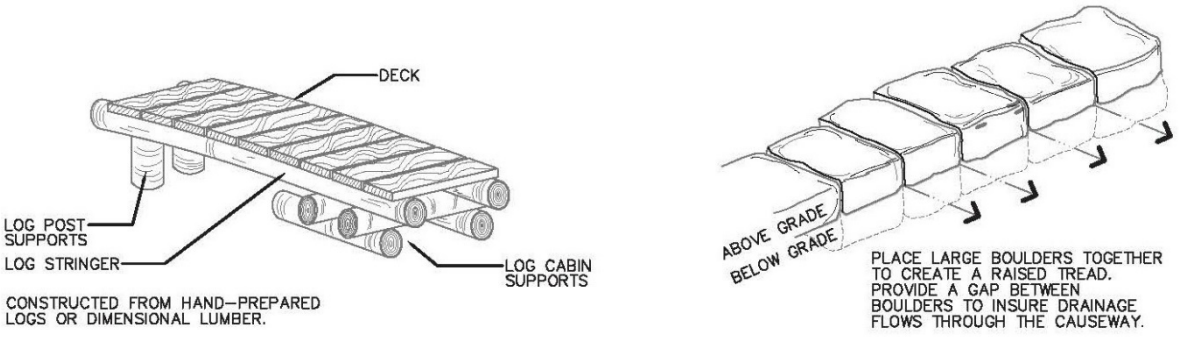


FIGURE 8. EXAMPLE WOODEN DECK LADDER BRIDGE AND BOULDER CAUSEWAY

OPERATIONS AND MAINTENANCE

Operational Strategies

As described in appendix B, desired conditions for Park operations identified during the visitor use management planning process include ensuring the ability of the Park to sustainably maintain and operate the mountain bike trail system. The Park also developed specific indicators and thresholds and would implement the monitoring and management strategies for each indicator identified in appendix B. All the Park's operational divisions—Administration, Facilities Management, Resource Education, Resource and Visitor Protection, Resource Management and Science, and the Superintendent's Office—would play an important role in operating and maintaining the proposed mountain bike trail system.

NPS and other public land agencies are experiencing increasing resource pressure (e.g., human capital, infrastructure, and natural resources' capacity) to meet new demands while simultaneously facing an increasing deferred maintenance backlog. For NPS, discretionary appropriations have remained flat in real terms for more than a decade, resulting in significant staffing losses despite increased Park visitation (Watkins 2019).

Park management acknowledges the challenges of operating and maintaining a new recreation area and recognizes the need to implement an operational strategy that achieves and sustains desired conditions. Accordingly, the following operational strategies are being considered:

- Strategy 1—Park staff would operate and maintain the mountain bike trail system with support from participants of the Volunteers-in-Parks program.
- Strategy 2—The Park would enter a Partnership Agreement with an outside entity that would operate and maintain the mountain bike trail system under NPS supervision in accordance with NPS standards and policies.
- Strategy 3—The Park would enter into a commercial services contract with a private entity that would operate and maintain the mountain bike trail system under NPS supervision in accordance with NPS standards and policies.

Each of these strategies are being considered for alternatives 2 and 3. Only strategies 1 and 2 are being considered for alternative 4 because this alternative does not include a concessions building. As described below, day-to-day operations and maintenance activities would be the same for each strategy and alternative.

If an action alternative were selected for implementation, construction would be contingent upon obtaining project-specific funding. Furthermore, the Park aims to proceed with construction only after an operational strategy and new long-term funding sources for administration, operation, and maintenance of the area are identified. Ideally, the operational strategy would have minimal impact on existing staff workloads and existing operational budgets. A business assessment would be conducted to determine the best strategy for serving the needs of visitors while balancing impacts on staff and resources. The business assessment would include a detailed analysis of staffing requirements and estimated costs associated with administration, operation, and maintenance of the mountain bike trail system for each Park division. If a commercial service contract were determined to be the most desirable strategy, Park staff would prepare and analyze a plan in a separate NEPA effort.

The EA also establishes initial mountain bike trail capacities for each of the action alternatives based on an average of 15 mountain bikers per mile (see appendix B). The Park would measure trail use to determine actual use relative to capacity. Visitor capacity would continue to be evaluated after the trail system is operational and could be modified based on future conditions and observations. Visitor capacities based on people at one time (PAOT) for the action alternatives are: alternative 2 – 192 PAOT, alternative 3 – 177 PAOT, and alternative 4 – 128 PAOT. Automated trail counters would be installed

during construction of the trail system at appropriate locations identified during the design process. If the trail system began to exceed capacity and affect desired conditions, NPS would explore options for dispersing visitors, including implementing direction-specific user flow management on selected trail segments or during peak visitation. If crowding, congestion, visitor conflicts, and safety concerns persisted, NPS would consider initiating planning and environmental compliance processes for implementing a reservation system to manage visitor access and improve visitor experience and/or increasing trail capacity by expanding the mountain bike trail system in adjacent portions the Parkway Section 8D corridor.

General Rules and Regulations

The general rules and regulations that apply to the Park would also apply to the proposed mountain bike trail system. These include 36 CFR Chapter I – National Park Service, Department of Interior and the Superintendent's Compendium of Designations, Closures, Request Requirements. Law enforcement and emergency response would continue to be provided under the operational control of NPS, with assistance from agencies with whom there are mutual aid agreements, such as Sevier County Ambulance, Tennessee Air National Guard, and Sevier County emergency management agency personnel. Users are expected to adhere to standard mountain bike trail etiquette as outlined in the International Mountain Biking Association's (IMBA) Rules of the Trail and would be encouraged to take the IMBA Mountain Biker Pledge (appendix C).

Like other Park trails where bicycles are allowed, non-motorized bicycles and Class 1 and Class 2 electric bikes would be authorized on the mountain bike trails. The use of Class 3 electric bikes would be prohibited. Electric bike class definitions are provided in appendix C.

Dogs, cats, and other pets (except service animals) would be prohibited on the trails and other areas except roads, parking areas, and established picnic areas.

Maintenance Activities

Preventive and routine maintenance activities would include:

- Buildings, grounds, and road maintenance (cleaning, painting, and general repair of buildings as needed, regular mowing of road shoulders)
- Trail corridor maintenance, including:
    - Cutting and removing encroaching plant growth, including branches, saplings, and woody annual growth along the trail corridor to maintain the proper width and height of the trail prism. Removing blowdowns (fallen trees) that have blocked the trail.
    - Repairing erosion of the trail surface, cleaning out water drains, and improving trail drainage when needed (e.g., repairing/replacing waterbars, installing new waterbars, and installing new drains).
    - Restoring upslope and downslope to designed conditions where soil is sloughing from the cut bank.
    - Performing in-kind maintenance, minor repairs, and/or replacement of trail structures such as drainage crossings.
- Maintenance of the existing open fields through a special use permit for haying or through mowing.
- Hazard tree removal.

ALTERNATIVE 2

Under alternative 2, the mountain bike trail system would include 3.8 miles of easy trail (green, less than 5% slope), 4.3 miles of moderate trail (blue, 5% to 10% slope), and 4.7 miles of advanced trail (black, 10% to 15% slope) for a total of 12.8 miles of mountain bike trails. Figure 9 provides the layout for alternative 2. Mountain bikers would use an at-grade crossing at Katy Hollar Road when using the advanced section of the trail. The trail system would include four drainage crossings over perennial streams(a stream that constantly flows throughout the year).

To access the mountain bike trail system, the Park would construct 0.65 miles of road and two trailheads. The proposed north trailhead would be located 0.32 miles from the start of the access road (proposed Parkway Section 8D), just south of Cove Creek, and would contain between 50 and 55 parking spaces. The south trailhead would be located at the end of the 0.65-mile access road and would have between 105 and 110 parking spaces and oversized vehicle parking. Alternative 2 would include a total of eight accessible parking spaces in two trailheads. Both trailheads would include the amenities described under "Elements Common to All Action Alternatives," with the exception that the north trailhead would not include a concession/bike rental space. Combined with associated amenities, the north trailhead would occupy approximately 1.2 acres, while the south trailhead would occupy approximately 2.2 acres. The bike trail would cross under the access road through a 10-foot by 10-foot box tunnel crossing in one location.

Overall, alternative 2 would disturb 22.3 acres during the construction period. Of these 22.3 acres, 5.6 acres would be impervious surfaces from the access road and buildings/trailheads, and 11.5 acres would be pervious trail improvements, including areas adjacent to the 4-foot-wide trail surface that may need to be cleared and contoured or shaped to achieve proper drainage. The remaining 5.0 acres would be temporarily disturbed during construction and revegetated with native vegetation once construction is complete. The additional 0.2 acres would be for the raised footprint of the bridge. A summary of all action alternatives is provided in table 1.

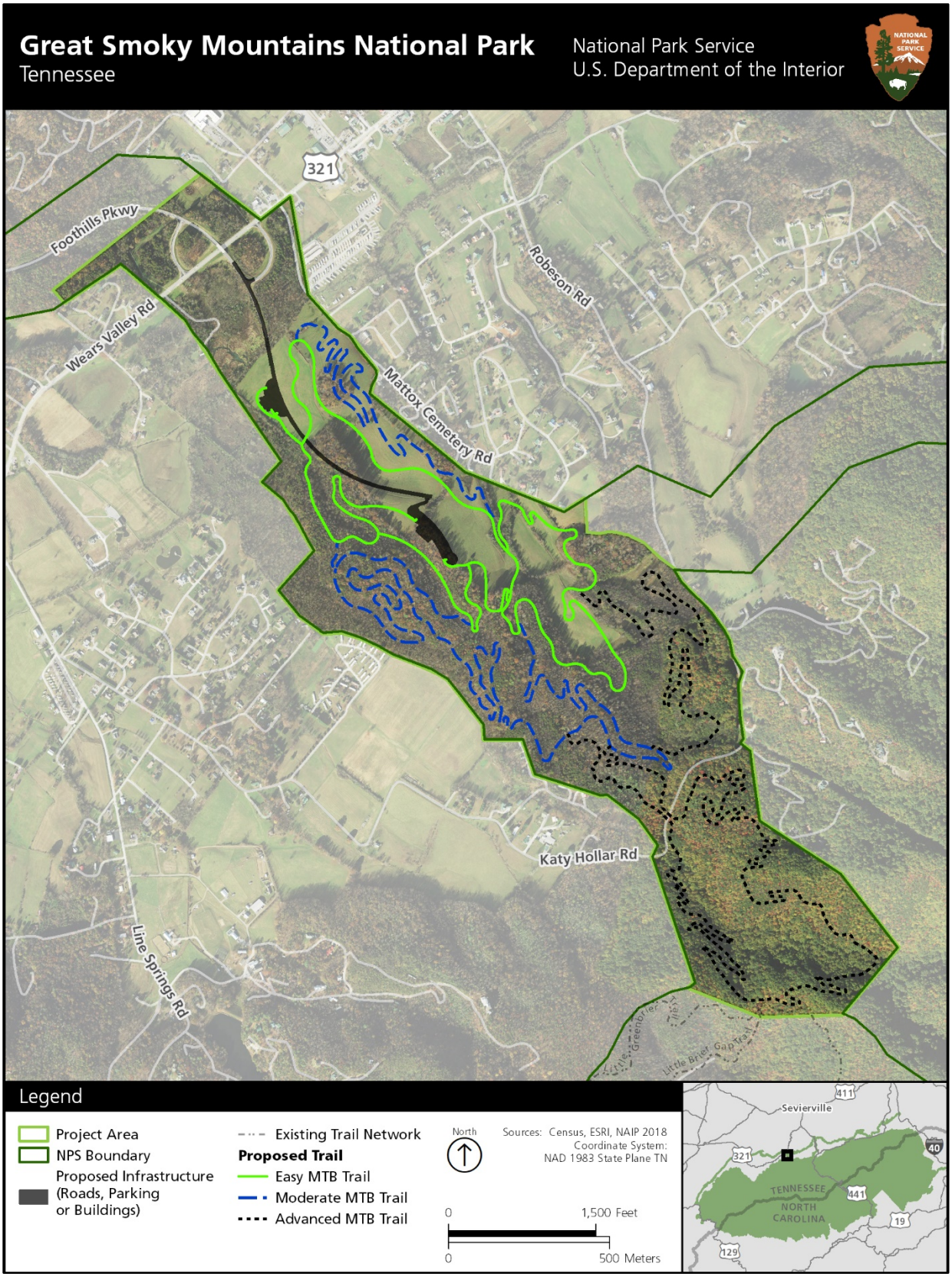


FIGURE 9. ALTERNATIVE 2

ALTERNATIVE 3—PROPOSED ACTION AND NPS PREFERRED ALTERNATIVE

Under alternative 3, the mountain bike trail system would include 4.2 miles of easy trail (green, less than 5% slope), 2.9 miles of moderate trail (blue, 5% to 10% slope), and 4.7 miles of advanced trail (black, 10% to 15% slope) for a total of 11.8 miles of mountain bike trails. Alternative 3 would also include 2.3 miles of pedestrian-only trails in the project area for a total of 14.1 miles of trails. Figure 10 provides the proposed layout under alternative 3. The trail system would include four drainage crossings over perennial streams (i.e., a stream that constantly flows throughout the year). Like alternative 2, the bike trail would cross under the access road through a 10-foot by 10-foot box tunnel crossing, and mountain bikers would use an at-grade crossing at Katy Hollar Road when using the advanced section.

Under alternative 3, 0.93 miles of road would be constructed along the proposed Parkway Section 8D road alignment to access the mountain bike trail system and trailhead. One centralized trailhead with approximately 135–145 parking spaces would be located at the end of the access road. Alternative 3 would offer six accessible parking spaces and space for 12 oversized vehicles. Combined with associated amenities, the trailhead would occupy approximately 2.4 acres. The preliminary location for the trailhead under this alternative is partially forested. If alternative 3 were selected for implementation, NPS would consider refining the location of this trailhead during design to reduce the amount of required tree clearing, potentially locating the trailhead partially or fully within the existing field. For analysis purposes, this Revised EA assumes the trailhead would be located completely within the forested area.

Overall, alternative 3 would require 25.4 acres of disturbance during the construction period. Of these 25.4 acres, 5.7 acres would be impervious surfaces for buildings, road, and parking areas, and 11.8 acres would be pervious trail improvements, including areas adjacent to the 4-foot-wide trail surface that would be cleared and contoured or shaped to achieve proper drainage, as appropriate. About 7.7 acres would be areas disturbed by earthmoving activities during construction that would be revegetated once construction is complete. The remaining 0.2 acres is the raised footprint of the bridge, same as alternative 2.

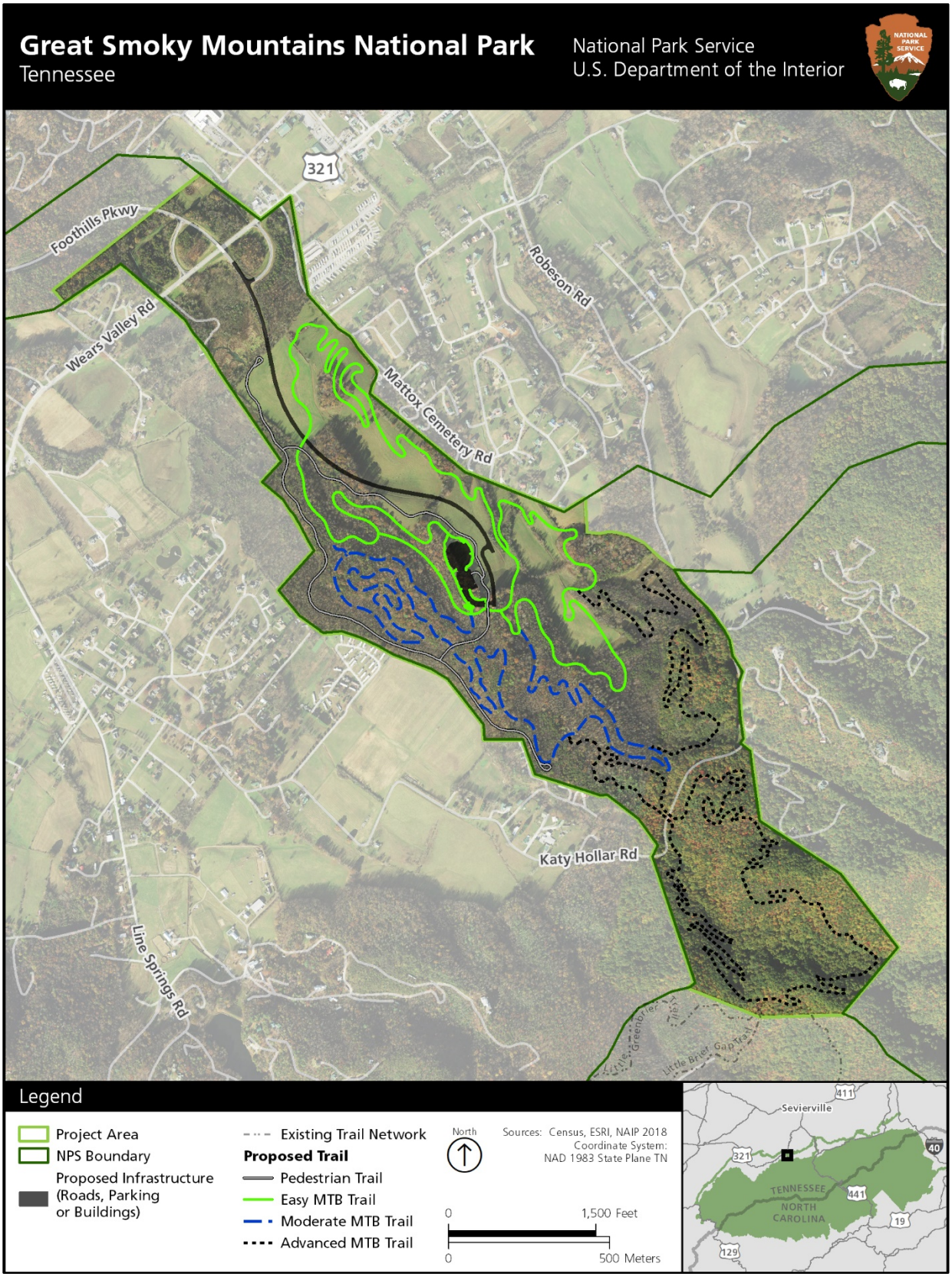


FIGURE 10. ALTERNATIVE 3—NPS PREFERRED ALTERNATIVE

ALTERNATIVE 4

Under alternative 4, the mountain bike trail system would include 2.9 miles of easy trail (green, less than 5% slope), 3.5 miles of moderate trail (blue, 5% to 10% slope), and 2.1 miles of advanced trail (black, 10% to 15% slope) for a total of 8.5 miles of mountain bike trails. Alternative 4 would also include 2.0 miles of pedestrian-only trails in the project area for a total of 10.5 miles of trails. Figure 11 provides the proposed layout under alternative 4. The trail system would include three drainage crossings over perennial streams (i.e., streams that constantly flow throughout the year) and one intermittent stream (i.e., a stream that flows seasonally). Because the access road would be shorter than the roads proposed under alternatives 2 and 3, alternative 4 would not require a box tunnel crossing for mountain bikers. No at-grade crossing of Katy Hollar Road would be required because the mountain bike trail system would occupy a smaller footprint in the project area and would not include any disturbance south of Katy Hollar Road.

Under alternative 4, NPS would construct 0.32 miles of road along the proposed Parkway Section 8D road alignment to access the mountain bike trail system and trailhead. Alternative 4 would have one trailhead, which would be the same as the north trailhead described under alternative 2 with 50–55 parking spaces. Alternative 4 would offer four accessible parking spaces. Alternative 4 would not include concessions or bike rental space. Combined with associated amenities, the trailhead would occupy approximately 1.2 acres.

Overall, alternative 4 would require 11.8 acres of disturbance during the construction period. Of these 11.8 acres, 2.2 acres would be impervious surfaces for buildings, road, and parking areas, and 8.2 acres would be pervious trail improvements, including areas adjacent to the 4-foot-wide trail surface that may need to be cleared and contoured or shaped to achieve proper drainage. About 1.2 acres would be areas disturbed by earthmoving activities during construction that would be revegetated once construction is complete. The remaining 0.2 acres would be for the raised footprint of the bridge, the same as alternatives 2 and 3. Operations, maintenance, and construction methods under alternative 4 would be the same as alternatives 2 and 3 except only strategies 1 and 2 are being considered for alternative 4 because this alternative does not include a concessions building.

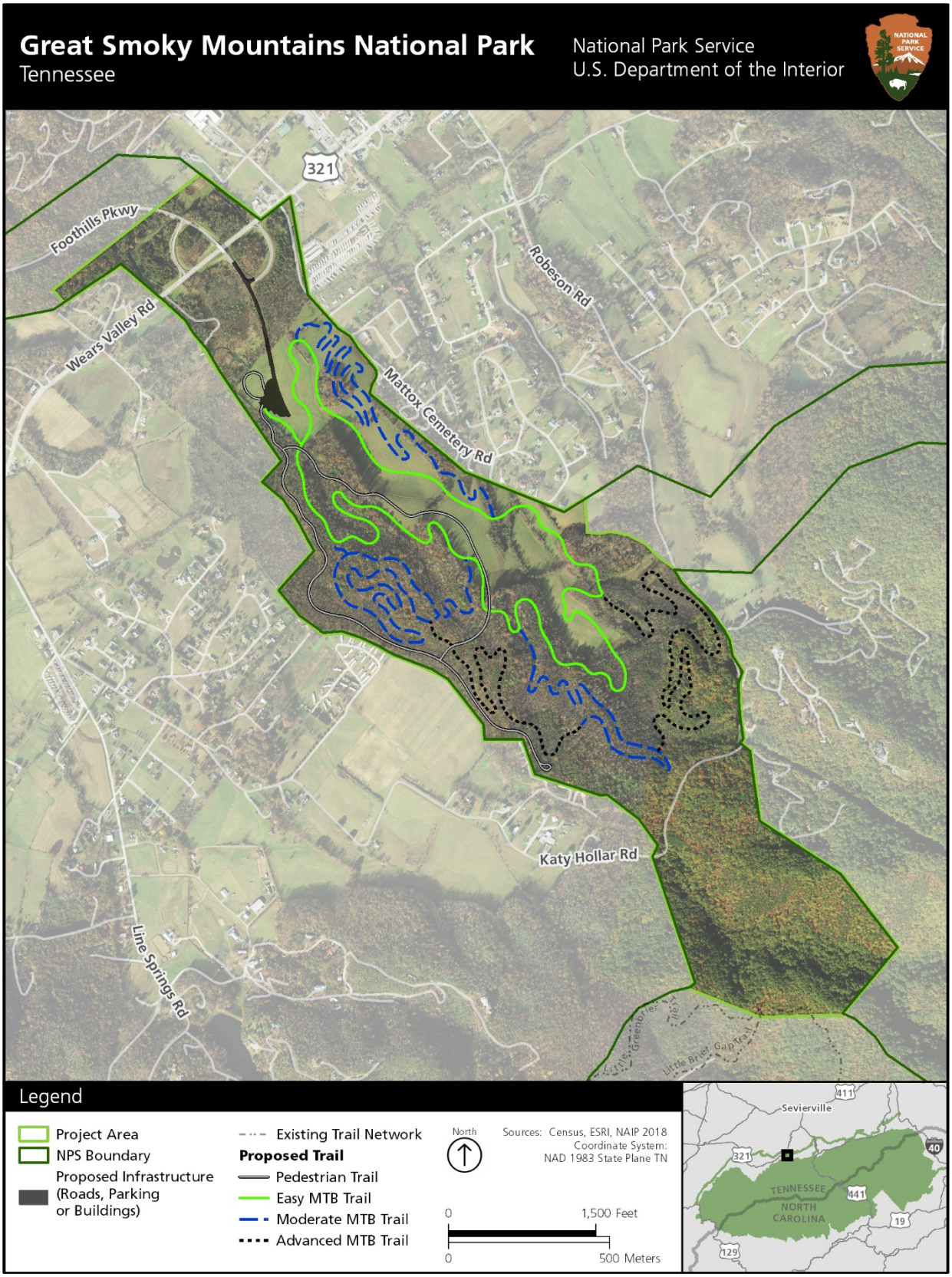


FIGURE 11. ALTERNATIVE 4

SUMMARY OF ALTERNATIVES

Table 1 provides a summary of the alternatives, including associated amenities and approximate potential disturbance

TABLE 1. SUMMARY OF ACTION ALTERNATIVE ELEMENTS

Alternative Element	Alternative 2	Alternative 3	Alternative 4
Trail Length (Total)	12.8 miles	14.1 miles	10.5 miles
Easy	3.8 miles	4.2 miles	2.9 miles
Moderate	4.3 miles	2.9 miles	3.5 miles
Advanced	4.7 miles	4.7 miles	2.1 miles
Pedestrian	none	2.3 miles	2.0 miles
Trailhead Areas / Parking	Two separate trailheads with a total of 155–165 total parking spaces	One trailhead with 135–145 parking spaces	One trailhead with 50–55 parking spaces
Access Road Length	0.65 miles	0.93 miles	0.32 miles
Bridges	1	1	1
Septic Systems	2	1	1
Potential Concessions/Bike Rental Space	Yes	Yes	No
Amenities (bike wash and repair station; comfort station, picnic tables; informational kiosk for orientation, trail etiquette, and rules for mountain biking)	Yes, at both trailheads	Yes	Yes
Disturbed Footprint (Temporary)	5.0 acres	7.7 acres	1.2 acres
Disturbed Footprint (Permanent)*	17.1 acres	17.5 acres	10.4 acres
Bridge Footprint (Raised)	0.2 acres	0.2 acres	0.2 acres
Total Footprint	22.3 acres	25.4 acres	11.8 acres

*Includes the 4-foot-wide trail surface plus vegetation and soils disturbance outside the defined trail, as described under alternative 2. This area would be disturbed but revegetated after construction.

MITIGATION MEASURES

NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts, and the following mitigation measures would be implemented under all of the alternatives to protect natural and cultural resources and ensure the quality of the visitor experience. The impacts analysis in chapter 3 assumes that the mitigation measures are implemented under all action alternatives.

DESIGN AND CONSTRUCTION

- Design and construct trails to (1) keep users from going off the trail, (2) avoid sensitive plants, and (3) avoid removal of large trees and damage to retained trees during construction.

- Incorporate bear-wise practices into the project design, including using bear-proof dumpsters, minimizing the number of picnic tables in the trailhead area, confining picnicking to a small area, and minimizing places where visitors tend to congregate and eat along the trails.
- Modify the proposed bike trail alignments to the extent possible to avoid or minimize impacts on sensitive plant species. Conduct pre-construction surveys and flagging for avoidance in areas where known sensitive plant species intersect with bike routes and associated infrastructure.
- Conduct tree and vegetation clearing between November 15 and March 31 to avoid impacts on federally listed bats and nesting birds. As noted above, avoid removal of large-diameter trees whenever possible to minimize impacts on bat habitat. Avoid damage to and properly prune damaged limbs on remaining adjacent trees.
- Mow open field areas within the project footprint prior to construction to avoid impacts on grassland nesting birds. The first mowing should be completed before the breeding season (April 23 to August 15) to discourage birds from establishing nests; mowing should continue at approximately 4-week intervals until construction starts.
- Prepare a Restoration Plan, to include at a minimum: (1) the location of revegetation sites; (2) locations and details for any needed topsoil storage; (3) plant species to be used; (4) time of year that the seeding will occur and the methodology of the seeding; (5) measures to control invasive vegetation; (6) monitoring plans; and (7) locations of temporary or permanent barricades, or other means to control unauthorized bike/vehicle access.
- Conduct pre-construction invasive plant treatment/removal and post-construction monitoring and control for invasive plants for one to three years. After the initial post-construction monitoring and control period, invasive plant management would be integrated with the Parkwide invasive plant management program. Long-term monitoring and control would be based on observed conditions and management priorities.
- Aerate any ground surface temporarily disturbed during construction and replant with native vegetation or Park-approved seed mix to reduce compaction and prevent erosion.
- Implement sediment and erosion control measures consistent with the requirements and recommendations contained in the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012). File Notice of Intent with TDEC to obtain coverage under the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Stormwater Associated with Construction Activities (Permit Number TNR100000). Develop site-specific stormwater pollution prevention plan in accordance with Part 3 of the General Permit, including any measures required for Tennessee Exceptional Waters, where applicable.
- Require contractor to develop and adhere to a spill prevention control and countermeasures plan during construction.
- Use excelsior logs, natural fiber blankets, and/or hydromulch in areas of disturbed bare soil with a potential for erosion to reduce surface runoff velocities and prevent sediment from entering drainages. All erosion control materials will be composed of fully biodegradable, non-plastic material (no “photodegradable” plastic is authorized).
- Construct a wildlife tunnel appropriate for amphibians and/or small mammals underneath the access road north of Cove Creek.
- Cease all work in the immediate area if archeological materials are inadvertently discovered. Notify Park Dispatch immediately. Do not proceed with work until authorized by the Superintendent, in consultation with the Park Cultural Resources Program Manager or the Park Archeologist.

- Close the project area to visitor use during the construction period.
- Require the contractor to remove food trash daily or use a bear-proof dumpster.
- Implement the following measures to stop further spread of invasive plants into and out of the project area:
    - Clean all earthmoving and seeding equipment prior to entering NPS lands. Cleaning would include wheels, undercarriages, dozer belly pans, bumpers, and all parts of heavy equipment. Complete all washing outside NPS lands. Once cleaned, the contractor would schedule inspection with Park staff to confirm sufficiency.
    - Use only topsoil, rock, sand, gravel, or other natural materials from Park-inspected and approved sources.
    - Treat priority invasive plant infestation in areas subject to ground disturbance and along roads used to access the project prior to construction.
- Implement the following measures to avoid and minimize impacts on karst resources consistent with the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012) and *Appendix B - Stormwater Design Guidelines for Karst Terrain* of the *Tennessee Permanent Stormwater Management and Design Guidance Manual* (TDEC & UT 2014), as applicable.
    - Avoid and minimize potential impacts to identified karst-like features and features of interest identified in figure 15 of this Revised EA as follows:
    - Avoid direct disturbance of soil or vegetation within a buffer surrounding identified karst-like features during the design and construction process. The avoidance buffer size would be consistent with those established for water resources and based on the best professional judgement of technical specialists knowledgeable of the specific karst feature and local karst resources.
    - Design access road, trailhead areas (buildings, parking, and septic systems), trails, and stormwater management system to minimize alteration of existing drainage into and out of these features.
    - Conduct geophysical and geotechnical surveys, as applicable, to identify underground karst features. The surveys would inform siting and design of the access road, trailhead areas (buildings, parking, and septic systems), and stormwater management system considering recommendations provided in the Karst Investigation Report (NPS 2022). Initial surveys would be conducted within the area of disturbance for the access road and trailhead areas for the selected alternative, with a buffer added to account for siting of stormwater management measures. The buffer would be based on best professional judgment of the survey and design team, and additional survey areas may be included as appropriate. The area of disturbance would be based on the 30% conceptual design drawings for the selected alternative. Survey data would inform the design process as follows:
        - If survey results indicate that underground karst features are not present, detailed design would proceed based on the existing 30% conceptual site plan for the selected alternative.
        - If survey results indicate that underground karst features are present, NPS would consider options for modifying the site plan for the proposed access road and trailhead within the existing project area to avoid and minimize impacts on identified underground karst resources.

- If modifications to the site plan are feasible, additional geophysical and geotechnical surveys would be conducted.
- If survey results for the modified site plan indicate that underground karst features are not present, NPS would modify the alternative and adjust the alignment accordingly to avoid karst resources.

▪ If no practicable alternatives exist for re-siting the proposed access road and trailhead area to avoid identified karst features, NPS would consider other design options and mitigation measures to minimize impacts on karst resources. If other design options and mitigation measures are feasible, NPS would revise the proposed action.

▪ In any case, if the proposed action was modified based on survey findings, NPS would revise the proposed action, determine if additional NEPA documentation is required, and identify the appropriate level of documentation in accordance with CEQ regulations and the NPS NEPA Handbook (NPS 2016). NPS would not implement the action until any required additional NEPA review is complete.

o Design permanent stormwater management measures following karst-specific guidelines, including those found in *Appendix B - Stormwater Design Guidelines for Karst Terrain* of the *Tennessee Permanent Stormwater Management and Design Guidance Manual* (TDEC & UT 2014).

▪ Minimize ponding, widely distribute infiltration, and treat runoff using small runoff reduction methods.

▪ Maintain, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow in accordance with Section 438 of the Energy Independence and Security Act of 2007.

o Maintain positive site drainage to collect and transport surface water away from structural areas and karst features that would otherwise not receive such surface water during construction and for the life of the structure.

o Verify that subsurface piping is sealed and pressure tested (where appropriate) prior to its placement in service. Maintain the subsurface piping to identify leaks and correct them in a timely manner.

OPERATION

- Encourage trail users to clean equipment and bike tires before and after use to control the spread of non-native/invasive plant species.
- Include informational kiosks with additional information to educate users on low-impact riding, reasons to stay on the trail, and the importance of cleaning equipment to prevent tracking non-native plants into the Park.
- Educate visitors on “leave-no-trace” practices and consequences associated with bears consuming human food and becoming habituated to humans.
- Implement good housekeeping practices, including daily and evening cleanup of human food and trash in the trailhead area.
- Implement standard protocols for managing human-bear conflicts as outlined in the Park’s black bear management guidelines, as approved by the Wildlife Branch Chief.

- Remove hazard trees only in consideration of bat protection requirements. If removal of a hazard tree with bat roost characteristics were needed between April 1 and November 14, NPS would have a qualified individual observe for bats for 30 minutes before and after sunset. The tree would be removed the following morning if bats were not observed. If bats were observed, the tree would be re-surveyed and would not be cut until survey confirms that bats are no longer roosting in the tree. In cases where imminent harm to life and property exists, hazard tree removal could be completed year-round in accordance with take exemptions under the 4(d) rule for the northern long-eared bat or the Park may temporarily close the area near the hazard tree until bats are no longer roosting in the tree.

ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

The following alternatives were considered but dismissed from further analysis because they were not considered reasonable alternatives (e.g., they did not meet purpose and need or were determined not to be technically or economically feasible):

- **Other types of recreational development**—Park managers considered a full range of potential recreational development opportunities for the Wears Valley portion of Parkway Section 8D, including concepts developed during previous planning efforts (see appendix A for a summary of previous planning efforts). Specific opportunities considered included a campground, picnic area, fishing lake, horse trails, and hiking trails. While these alternatives would be compatible with future completion of the Parkway, they do not fully meet the purpose and objectives of the proposed action because these types of recreation are now readily available elsewhere in the Park. Development of purpose-built mountain biking trails was identified as the best opportunity to provide a unique recreational opportunity and to increase the diversity of recreational experiences available to Park visitors. However, dismissal of other types of recreational development in this Revised EA does not preclude the Park from pursuing additional development options identified elsewhere in the Park planning portfolio as the Parkway is further constructed.
- **Other locations for recreational development**—The *Foothills Parkway Master Plan* and the *General Management Plan* identified several areas along the Parkway for possible recreational development. The current planning effort focuses on the Wears Valley portion of Section 8D for reasons discussed in the "Need for the Action" section in chapter 1. The Park may consider other locations for recreational development along the Parkway under separate planning efforts.
- **Additional mountain bike trail elements**—As the alternatives narrowed to mountain bike facilities, various mountain bike facility elements were also considered, including pump tracks and highly built skill challenges. Such elements were later dismissed because of their impacts on the Park and because these elements are more focused on intensity of experience versus enjoyment of the surrounding scenic beauty.
- **Alternative access points**—Additional trailhead parking locations along county roads (e.g., Katy Hollar Road and Mattox Cemetery Road) were considered. These alternatives would eliminate the need to build a bridge over Cove Creek to access the site. Access to the mountain bike trail system via Park property was preferred to minimize impacts on county roads and adjacent neighborhoods. In addition, establishing alternative access points would be inconsistent with the *Foothills Parkway Master Plan*, which identified seven specific access points along the Parkway. Therefore, alternative access points were dismissed from detailed analysis in the Revised EA.
- **Alternative access road alignments**—An access road adjacent/parallel to the identified Parkway Section 8D road alignment was explored for interim and/or permanent access to the mountain bike trail system. Instead, the planning team determined that the access road could be built within

the first mile of the previously identified Parkway Section 8D alignment. By avoiding parallel roads, land disturbance and visual intrusions to the Parkway landscape would be minimized, and more acreage for mountain bike trails would be provided.

- **Alternative (non-paved) access road surface**—Construction of a gravel access road within the current 8D corridor was considered. This alternative would reduce the impact on resources, the area of impervious surface, cost, and overall footprint of the project. This alternative was dismissed because the eventual construction of the entire Section 8D is a reasonably foreseeable action consistent with the *Foothills Parkway Master Plan* and *General Management Plan*. In addition, a gravel road would still require a vehicular bridge over Cove Creek. Lastly, a gravel road would require continuous upkeep and would likely need to be redesigned in the future if Section 8D were constructed as originally envisioned. Therefore, a non-paved access road was dismissed from detailed analysis in the Revised EA.
- **Hiking trail connecting to other trails in the Park**—The planning team considered constructing a longer hiking trail under alternatives 3 and 4 that would connect to Little Greenbrier near Little Brier Gap. A wider connection to existing adjacent trails was not included in this planning project but may be considered in the future.
- **Bike trail bridge or tunnel at Katy Hollar Road**—A bike trail bridge or tunnel at the Katy Hollar Road crossing was considered but dismissed because of the expense required to implement and maintain. Instead, safety features were incorporated into the action alternatives.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment and analyzes the potential environmental impacts of each alternative for the resources described below. The affected environment describes existing conditions for those elements of the human environment that would be affected by the implementation of the alternatives considered in this EA. Impacts on each of these topics are then analyzed in the "Environmental Consequences" section for each alternative. As required by the CEQ regulations implementing NEPA, this chapter compares the environmental consequences for each alternative.

As previously noted, a new impact topic "Karst Resources" has been added to the Revised EA for detailed analysis. Other sections have not changed since the 2020 EA. Responses to substantive comments received from the public in October 2020 have been provided in appendix D.

ISSUES AND IMPACT TOPICS

NPS identified a range of issues and impact topics to evaluate in this EA. Several issues were also eliminated from further consideration. The NPS *NEPA Handbook* provides specific guidance for determining whether to retain issues for detailed analysis. Issues should be retained for consideration and discussed in detail if:

- the environmental impacts associated with the issue are central to the proposal or of critical importance;
- a detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives;
- the environmental impacts associated with the issue are a big point of contention among the public or other agencies; or
- there are potentially significant impacts to resources associated with the issue (NPS 2015).

If none of the considerations above apply to an issue, it was dismissed from detailed analysis. Issues and impact topics dismissed from detailed analysis, including dismissal rationale, are provided in appendix E. Issues carried forward for detailed analysis fall under the following impact topics:

- Soils
- Surface Waters
- Vegetation
- Visitor Use and Experience
- Wildlife, including Threatened and Endangered Species
- Karst Resources (new impact topic in the Revised EA)

As detailed further in appendix E, all three action alternatives would have the same impacts on wetlands and floodplains. As a result, a detailed analysis of environmental impacts in the EA is not required to make a reasoned choice between these alternatives. In accordance with Executive Orders 11988, "Floodplain Management," and 11990, "Protection of Wetlands," NPS evaluated the impacts on these resources in a combined Wetlands and Floodplains Statement of Findings, provided in appendix F.

GENERAL METHODOLOGY FOR ESTABLISHING AND ASSESSING IMPACTS

In accordance with CEQ regulations, direct, indirect, and cumulative impacts are described (40 CFR 1502.16), and the impacts are assessed in terms of context and intensity (40 CFR 1508.27) (CEQ 1978). Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts. The geographic study area (or area of analysis) for this assessment is the project area.

The potential impacts of the alternatives are described in terms of type, as follows:

> **Direct:** Impacts that would occur as a result of the proposed action at the same time and place of implementation (40 CFR 1508.8) (CEQ 1978).
>
> **Indirect:** Impacts that would occur as a result of the proposed action but later in time or farther in distance from the action (40 CFR 1508.8) (CEQ 1978).
>
> **Beneficial:** A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
>
> **Adverse:** A change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.

The impacts of the alternatives consider both context and intensity. Context is the setting, situation, or circumstances surrounding a particular resource (40 CFR 1508.27(a)) (CEQ 1978). Context provides a backdrop against which the intensity of impacts can be applied to understand their importance. Intensity is the severity or magnitude of an impact (40 CFR 1508.27(b)) (CEQ 1978).

CUMULATIVE IMPACTS

Federal regulations require identifying past, present, or reasonably foreseeable future actions that would affect the resources evaluated in this EA to assess cumulative impacts at and around the Park. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7) (CEQ 1978). Cumulative impacts are determined for each impact topic by combining the impacts of the alternative being analyzed and other past, present, and reasonably foreseeable actions that would result in beneficial or adverse impacts. Because some of these actions are in the early planning stages, the evaluation of the cumulative impact is based on a general description of the project. These actions were identified through the internal project scoping process and are summarized below. Table 2 provides the list of cumulative projects associated with each impact topic and the area of analysis. Because the no action alternative would not contribute any new impacts, no cumulative impacts would be associated with it.

TABLE 2. CUMULATIVE PROJECTS

Impact Topics	Area of Analysis	Projects Analyzed
Soils	Project Area	• Parkway Section 8D
Surface Waters	General vicinity within the watershed	• Parkway Section 8D and 8E • Residential Development in Wears Valley
Vegetation	1-mile radius from our Project Area, to include the Metcalf Bottoms project area	• Parkway Section 8D and 8E • Residential Development in Wears Valley
Visitor Use and Experience	Wider study area includes a range of pedestrian and bicycle related opportunities in the vicinity	• Parkway Section 8D • Metcalf Bottoms Access Improvements • Cades Cove Vehicle-Free Day Pilot Study • Gatlinburg Spur Greenway • Cocke County Hall's Top Mountain Bike Trail System • Look Rock Campground Rehabilitation • Vee Hollow Mountain Bike Trail System
Wildlife, including Threatened and Endangered Species	General vicinity of the project area	• Parkway Section 8D and 8E • Residential Development in Wears Valley
Karst Resources	General vicinity of the project area	• Parkway Section 8D • Residential Development in Wears Valley

Past Actions

*Construction of Foothills Parkway Section 8E***.** Section 8E was opened for public use in November 2018. While most of the tree clearing associated with the project was completed in the 1980s, 12 acres of tree removal associated with the final mile of Section 8E, the mile adjacent to the project area for this EA, was completed within the last 10 years. This tree removal is included as a cumulative action.

Present Actions

Vee Hollow Mountain Bike Trail System. Located in Townsend, Tennessee, Vee Hollow provides a 14-mile mountain bike trail network. The trail system is open year-round and is free to visitors. Trail construction was completed in 2021.

Rehabilitation and Reopening of Look Rock Campground and Picnic Area. Look Rock Campground and Picnic Area is located along the Parkway, just east of Happy Valley Road and approximately 23 miles west of the project area. This campground and picnic area were closed in 2013 because of failing infrastructure and a reduced maintenance budget. In 2018, funding was identified to reopen the developed areas in phases. The picnic area was rehabilitated first and reopened on July 26, 2019. The next phase is currently underway and includes replacing the potable water system, repaving the roads, and rehabilitating the campground. The campground and picnic area is anticipated to reopen in 2022.

Cades Cove Vehicle-Free Day Pilot Study. This pilot study aims to promote non-vehicular travel, relieve congestion, and improve visitor safety and experience. Prior to 2020, the Cades Cove Loop Road was

closed on Wednesday and Saturday mornings until 10:00 AM from May to September. The pilot project closed the loop road to vehicular traffic all day on Wednesdays during the 2020 and 2021 seasons, which started in June and concluded in September. During this time, the Park did not continue the Saturday morning vehicular closures. The Park will assess this new schedule and make a determination regarding future vehicle-free days.

Residential Development in Wears Valley. Residential development in Wears Valley has been increasing, and residential properties include primary residences, rental homes, and secondary vacation homes. The population of the census tract that includes most of Wears Valley, including the project area, has increased by approximately 20% since 2010 (US Census 2019).

Reasonably Foreseeable Future Actions

Development of Hall's Top Mountain Bike Trails in Cocke County, Tennessee. In May 2020, the Cocke County Partnership received a $500,000 grant from the Appalachian Regional Commission for development of mountain bike and hiking trails in Cocke County. The planning effort is beginning and is being led by the Cocke County Partnership and the US Forest Service. The plan envisions a trailhead and between 50 to 75 miles of trails on mostly Forest Service land.

Development of Foothills Parkway Section 8D. Building on prior planning efforts and environmental studies for the Parkway, NPS intends to reinitiate the NEPA planning process for the 9.8-mile Section 8D in 2022. Planning efforts will involve developing a new NEPA document for Section 8D that builds on information from the *Draft Environmental Impact Statement for the Foothills Parkway, Section 8D* (NPS 1994). NPS will work with other federal, state, and local government partners to review input and suggestions provided by the public throughout the NEPA planning process.

Metcalf Bottoms Access Improvements. The Park is working to improve access to Metcalf Bottoms from Wears Valley. The Metcalf Bottoms area is currently accessible from US Highway 321 in Wears Valley via Line Spring Road/Wear Cove Gap Road. This two-lane paved road was not designed to serve as a primary entrance to the Park or to support current levels of visitor and local traffic. Use of this route as an entrance has resulted in increased traffic through the Metcalf Bottoms Picnic Area and conflicts from large recreational vehicles attempting to navigate the one-lane bridge over the Little River. A range of alternatives will be analyzed during the planning process to address the deficiencies of the existing Wear Cove Gap Road alignment. Previously developed preliminary options to construct a new road from Metcalf Bottoms directly to the Parkway have been dismissed from further consideration at this time. The NEPA process is anticipated to begin in 2022.

Gatlinburg Spur Greenway. The portion of US 441/US 321 known as the Gatlinburg Spur is managed by the Park and connects the cities of Pigeon Forge and Gatlinburg, Tennessee. The Spur is a divided, four-lane roadway. The West Prong of the Little Pigeon River flows between the north- and southbound lanes. The Gatlinburg Spur Greenway project will explore the feasibility of a multiuse (pedestrian and bicycle) trail between Gatlinburg and Pigeon Forge to connect with existing and future greenways within these gateway communities. The project aims to encourage visitors to be active and enjoy the Park outside their vehicles. NPS anticipates the NEPA process would begin in 2023.

SOILS

AFFECTED ENVIRONMENT

The US Department of Agriculture-Natural Resources Conservation Service's (USDA-NRCS) Web Soil Survey indicates that the soils in the project area consist of 16 distinct map units (USDA-NRCS 2020). A map unit is a grouping of soils by their natural landscape and soil patterns. Most soil map units shown on detailed soil maps are phases of soil series. Figure 12 shows the locations of the map units within the project area boundary. Soils within the same series were combined, so the map displays 10 map units. Approximately 41% of the project area consists of the Braddock series, which has very deep, well-drained, and moderately permeable soils formed in colluvium and alluvium, derived mostly from a mixture of crystalline rocks. These soils are typically found on mountain slopes, as well as adjacent high terraces (USDA-NRCS 1995). Other common soil series (i.e., 37% cover) in the project area include:

- Junaluska Series: The Junaluska series consists of moderately deep, well-drained, and moderately permeable soils on ridges and side slopes of the southern Appalachian Mountains. These soils formed in residuum that is affected by soil creep in the upper part and is weathered from low grade metasedimentary rocks, such as phyllite, slate, and low grade, thinly bedded metasandstone (USDA-NRCS 2007).
- Shelocta Series: The Shelocta series consists of deep and very deep, well-drained, and moderately permeable soils formed in mixed colluvium from shale, siltstone, and sandstone or colluvium and residuum. They are found on steep concave mountain sides, foot slopes, and benches (USDA-NRCS 2001).
- Cataska Series: The Cataska series consists of moderately deep and excessively drained soils. They formed in materials weathered from siltstone, shale, and phyllite and are found on uplands (USDA-NRCS 2013).

Approximately 14% of the remaining series found in the project area consist of moderate to well-drained soils, except for the Steadman and Dunning series. The Steadman and Dunning series make up approximately 8% of the project area and consists of very deep and poorly drained soils with low permeability. These soils formed in fine-textured alluvium wash and are found on limestone hillsides (USDA-NRCS 2010). As discussed further under "Karst Resources," soils within the project area that are prone to sinkhole formation or soils that are typically associated with alluvial fans include the Braddock, Steadman, and Talbott series.

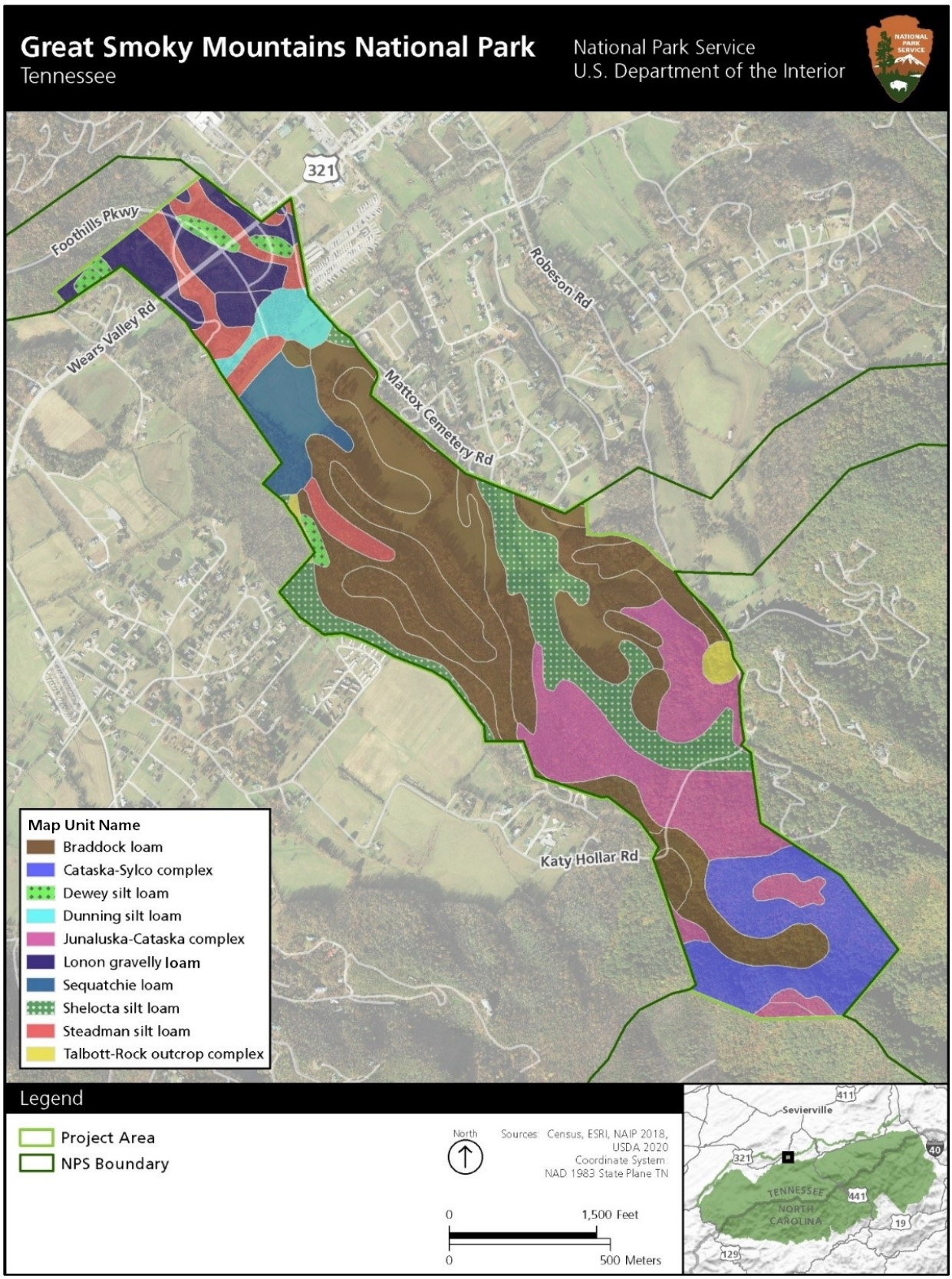


FIGURE 12. SOILS MAP UNITS IN THE PROJECT AREA

ENVIRONMENTAL CONSEQUENCES

Alternative 1—No Action

Under the no action alternative, there would be no change to the use of the project area. The open fields would continue to be used for hay production (approximately 66 acres) under a special use permit. Therefore, no new impacts on soils are anticipated.

Alternative 2

Construction of the mountain bike trail system, access road, and trailheads would disturb soils and cause displacement, compaction, and erosion that each affect soil processes and require soil management. USDA-NRCS rates soils for recreational development, including for the construction of paths and trails, based on the soil properties that affect pedestrian or vehicular movement and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer. Under alternative 2, construction would disturb approximately 22.1 acres of soil. Because 57% of the area to be disturbed consists of the Braddock and Shelocta series, most soil disturbance (i.e., 12.7 acres) would occur on these well-drained and moderately permeable soil series. USDA-NRCS rates the Braddock and Shelocta series as "somewhat limited," which indicates that the soil has properties that are moderately favorable for the recreational development. Limitations (e.g., dust production) can be overcome or minimized by special planning, design, or installation techniques (USDA-NRCS 2020). Approximately 20% (4.5 acres) of the area to be disturbed consists of the Junaluska and Cataska series. USDA-NRCS rates these series as "very limited," which indicates that the soil has one or more properties that are unfavorable for recreational use, including slope or potential erodibility. The remaining 23% (5.2 acres) of soil disturbance would be distributed among the other soil series found in the project area. Of these 5.2 acres, less than 1 acre of disturbance would be in the Steadman and Dunning series, specifically in the vicinity of the access road and bridge near the connection with Parkway Section 8E. In this location, poor drainage and low permeability would be addressed during design. Impacts on soils would be minimized through the mitigation measures noted in chapter 2, including a sediment and erosion control plan and requirements of a NPDES permit. Table 3 provides the acres of impact by soil map unit.

TABLE 3. IMPACTS ON SOILS–ALTERNATIVE 2

Soil Map Unit	Acres	Percent of Soils Disturbed in Project Area
Braddock loam	11.7	2.8%
Cataska-Sylco complex	1.3	0.3%
Dewey silt loam	0.0	0.0%
Dunning silt loam	0.7	0.2%
Junaluska-Cataska complex	3.2	0.7%
Lonon gravelly loam	1.0	0.2%
Sequatchie loam	3.1	0.8%
Shelocta silt loam	1.0	0.2%
Steadman silt loam	0.1	0.1%
Talbott-Rock outcrop complex	0.0	0.0%
TOTAL	**22.2**	**5.3%**

During operation and use of the trail system, upland areas with steep grades (i.e., >10%), which include the Junaluska and Cataska soils series, could result in greater soil degradation than areas with limited slope. However, trails that are routed across slopes would experience less erosion from tread incision and water runoff than trails that run directly down slope. The preliminary layout of the trail system used natural topography to minimize these impacts, which would be further limited by design methods, including use of grade reversals and drainage installations. These methods would quickly eliminate water from the upland trail system after a rain event, which would further reduce erosion, standing water, and long-term trail maintenance needs.

The Steadman and Dunning series, which are occasionally flooded, could see a higher intensity of adverse impacts from visitor use because of their ability to retain water. However, only 0.2 acres of the trail system would include these soils, and they are located in generally flat areas. Sustainable design techniques to quickly eliminate water from the trail system and signage reminding visitors to stay on the trail and not to ride on wet trails would minimize soil impacts in these locations.

Mountain bike use could also adversely impact soils on the trails at the four perennial stream crossings. Mountain bike use can create tread incision along trails with high soil moisture content, resulting in excess water runoff that causes sediment transport. Furthermore, visitors may unintentionally widen trails to avoid muddy or puddled areas as described above, which could increase sedimentation in surface waters. Elevated stream crossings would be used in these locations to avoid these impacts. Most soils in the project area are well-drained and moderately permeable. As a result, it is anticipated that soil cohesion would be maintained under alternative 2, and increased compaction or channeling of water directly down slopes would be minimal.

Overall, alternative 2 would result in direct, short- and long-term, adverse impacts on 22.1 acres, or 5.3% of all soils in the project area. Of the 22.1 acres of total disturbance, 5.6 acres would be permanent impacts from installation of impervious surfaces for the trailhead and road surfaces, which would permanently alter approximately 1% of soils in the project area. The remaining 16.5 acres would include both temporary impacts from cut and fill activities (5.0 acres) and construction of the mountain bike trails (11.5 acres), which would alter approximately 4% of soils in the project area but would not permanently convert soils to impervious surface. While soils in the location of the trails would not be permanently altered, potential soil erosion and compaction could occur. However, the limited amount of disturbance compared to the size of the project area and the use of mitigation measures and sustainable design concepts would ensure adverse impacts on soils would be minimal. In the context of the surrounding landscape, alternative 2 would affect commonly occurring soils in this area of the Park that are well-drained, moderately permeable, and moderately favorable for recreational development.

Cumulative Impacts. No past or ongoing projects would contribute cumulative impacts. Reasonably foreseeable projects with the potential to affect soils in the project area include the development of Parkway Section 8D. Construction of Parkway Section 8D would permanently alter soils and increase impervious surface in the project area, resulting in long-term, adverse impacts on soils.

Alternative 2 would contribute adverse impacts on soils in the project area from the conversion of native vegetation to a bare soil mountain bike trail system and from the installation of impervious surfaces such as the access road and trailheads. Increased visitation would also have adverse impacts on soils from mountain bike use. When the incremental impacts from alternative 2 are combined with the impacts from the reasonably foreseeable action, the overall cumulative impact on soils would be adverse. The primary driver of adverse cumulative impacts would be the additional road development projects, which would disturb a larger area of soils in the project area.

Alternative 3—NPS Preferred Alternative

Impacts on soils under alternative 3 would be similar to those described for alternative 2. Approximately 25.2 acres of soil would be disturbed during the construction period. More than 65% of the construction

area consists of the Braddock and Shelocta soil series, and most soil disturbance (16.7 acres) would occur on these soil series. Disturbance to remaining soil series would be the same or less than alternative 2. Alternative 3 would disturb an additional 3.0 acres of soil compared to alternative 2, all of which would be within the Braddock and Shelocta soil series. Table 4 provides the acres of impact by soil map unit.

TABLE 4. IMPACTS ON SOILS–ALTERNATIVE 3

Soil Map Unit	Acres	Percent of Soils Disturbed in Project Area
Braddock loam	15.5	3.6%
Cataska-Sylco complex	1.3	0.3%
Dewey silt loam	0.1	0.0%
Dunning silt loam	0.7	0.2%
Junaluska-Cataska complex	3.1	0.8%
Lonon gravelly loam	1.0	0.2%
Sequatchie loam	2.2	0.5%
Shelocta silt loam	1.2	0.3%
Steadman silt loam	0.1	0.1%
Talbott-Rock outcrop complex	0.0	0.0%
TOTAL	**25.2**	**6.0%**

During operation, the Steadman and Dunning series would see a higher intensity of adverse impacts from foot traffic and mountain biking because of their ability to retain water. Trail use associated with alternative 3 would impact 0.1 acre more of these soil series, but total disturbance of these series would remain at less than 1 acre overall. Soils on trails at four perennial stream crossings would also be adversely affected by displacement and erosion at the same intensity as described under alternative 2. These impacts would continue to be avoided by use of elevated stream crossings in these locations.

Like alternative 2, most soils in the project area are well-drained and moderately permeable; therefore, it is anticipated that soil cohesion would be maintained under alternative 3. Use of sustainable design concepts and mitigation measures would reduce the potential for adverse impacts and would include building trails in dry soils where possible, maintaining grades, using grade reversals and drainage installations, and incorporating signage reminding visitors to stay on the trail and not to ride on wet trails.

Overall, alternative 3 would result in direct, short- and long-term, adverse impacts on 6% of all soils in the project area. Of these 25.2 acres of disturbance, 5.9 acres would be permanent impacts from installation of impervious surfaces for the trailhead and road surfaces, which would permanently alter approximately 1% of soils in the project area. The additional 19.3 acres would include both temporary impacts from cut and fill activities (7.7 acres) and construction of the mountain bike and pedestrian trails (11.8 acres), which would alter approximately 5% of soils in the project area but would not permanently convert soils to impervious surfaces. While soils in the location of the trails would not be permanently altered, soil erosion and compaction could occur. However, the limited amount of disturbance compared to the size of the project area and the use of mitigation measures and sustainable design concepts would ensure adverse impacts on soils would be minimal. In the context of the surrounding landscape, alternative 3 would affect commonly occurring soils in this area of the Park that are well-drained, moderately permeable, and moderately favorable for recreational development.

Cumulative Impacts. Impacts on soils from the cumulative project would be the same as those described for alternative 2. Alternative 3 would contribute adverse impacts on project area soils from the conversion of native vegetation to a bare soil mountain bike and pedestrian trail system and from the installation of

impervious surfaces such as the access road and trailhead. Bicycles and foot traffic associated with increased visitation would also have adverse impacts on soils. When the incremental impacts from alternative 3 are combined with the impacts from reasonably foreseeable actions, the overall cumulative impact on soils would be adverse. The primary driver of adverse cumulative impacts would be the additional road development projects, which would likely disturb a larger area of soils in the project area.

Alternative 4

Under alternative 4, 11.6 acres of soil would be disturbed during construction. Impacts on the Braddock and Shelocta soil series would be the same as those described for alternative 2, but to a lesser extent because of the smaller footprint and less soil disturbance (5.9 acres) associated with alternative 4. This alternative would also disturb less area of other common soil series than alternatives 2 and 3. Only 1.5 acres of the Junaluska series and 0 acres of the Cataska series would be permanently disturbed because construction would not occur south of Katy Hollar Road, where the steepest topography exists in the project area. The remaining 4.2 acres of soil disturbance would be distributed among the other soil series found in the project area. Table 5 provides the acres of impact by soil map unit.

TABLE 5. IMPACTS ON SOILS–ALTERNATIVE 4

Soil Map Unit	Acres	Percent of Soils Disturbed in Project Area
Braddock loam	5.2	1.2%
Cataska-Sylco complex	0.0	0.0%
Dewey silt loam	0.1	0.0%
Dunning silt loam	0.7	0.2%
Junaluska-Cataska complex	1.5	0.4%
Lonon gravelly loam	0.8	0.2%
Sequatchie loam	2.4	0.6%
Shelocta silt loam	0.7	0.2%
Steadman silt loam	0.1	0.1%
Talbott-Rock outcrop complex	0.1	0.0%
TOTAL	**11.6**	**2.8%**

Like alternatives 2 and 3, the Steadman and Dunning series would see a higher intensity of adverse impacts post-construction from foot traffic and mountain biking because of their ability to retain water. The amount and type of impacts on these soils would be the same as alternative 2. Displacement and erosion would also adversely affect soils on the trails at three stream crossings. These impacts would be avoided using elevated stream crossings.

As discussed under alternatives 2 and 3, most soils in the project area are well-drained and moderately permeable; therefore, it is anticipated that soil cohesion would be maintained under alternative 4. Furthermore, upland areas with steep grades south of Katy Hollar Road, which include the Junaluska and Cataska series, would not be disturbed for mountain bike trail construction under alternative 4, which would reduce the potential for soil degradation, erosion from tread incision, and water runoff from trails in this location. Alternative 4 would not affect the Cataska soil series at all.

Overall, alternative 4 would result in direct, short- and long-term, adverse impacts on less than 3% of all soils in the project area. Of these 11.6 acres of disturbance, 2.4 acres would be permanent impacts from installation of impervious surfaces for the trailhead and road surfaces, which would permanently alter less than 1% of soils in the project area. The remaining impacts would include both temporary impacts from cut and fill activities (1.2 acres) and construction of the mountain bike and pedestrian trails (8.2 acres),

which would alter approximately 2.2% of soils in the project area but would not permanently convert soils to impervious surfaces. While soils in the location of the trails would not be permanently altered, soil erosion and compaction could occur. However, the limited amount of disturbance compared to the size of the project area and the use of mitigation measures and sustainable design concepts would ensure adverse impacts on soils would be minimal. In the context of the surrounding landscape, alternative 4 would affect commonly occurring soils in this area of the Park that are well-drained, moderately permeable, and moderately favorable for recreational development.

Cumulative Impacts. Impacts on soils from the cumulative project would be the same as those described for alternative 2. Alternative 4 would contribute adverse impacts on soils in the project area from the conversion of native vegetation to a bare soil mountain bike trail system and the installation of impervious surfaces such as the access road and trailhead. Bicycles and foot traffic associated with increased visitation would also have adverse impacts on soils. When the incremental impacts from alternative 4 are combined with the impacts from reasonably foreseeable actions, the overall cumulative impact on soils would be adverse. The primary driver of adverse cumulative impacts would be the additional road development projects, which would likely disturb a larger area of soils in the project area.

SURFACE WATERS

AFFECTED ENVIRONMENT

The 425-acre project area is within the Lower French Broad River (06010107) hydrologic unit code (HUC)-8 watershed (509,776 acres). Surface water resources in the project area include perennial and intermittent streams, and ephemeral drainages—3.2 miles of streams/drainages (1.5 miles of perennial, 0.7 miles of intermittent, and 1.0 mile of ephemeral drainages) (figure 13). In addition, the project area includes approximately 7 acres of wetlands; potential impacts on wetlands are analyzed in the statement of findings available in appendix F. Ephemeral drainages flow for brief periods as a direct result of precipitation, while intermittent streams flow based on seasonal changes in runoff. Cove Creek is a major perennial stream (i.e., flows year-round) in the project area. The creek meanders through thick alluvial soils along its floodplain and has slumping banks and a silty bottom in most places. The smaller tributaries' headwaters to Cove Creek lie mostly at springs and seeps in the forested slopes above Wears Valley. Major tributaries to Cove Creek are Machine Branch, Sugar Camp Branch, and Rymel Branch. Overall, streamflow patterns in Wears Valley are seasonal with low or no flow in summer and fall, low to moderate base flow in winter, and occasional winter and summer peaks associated with storm events. All the stream channels that drain from the project area ultimately flow into the West Prong Little Pigeon River at the north end of Pigeon Forge, Tennessee (NPS 1994).

TDEC manages water quality in the project area under the criteria standards, antidegradation statement, and use classifications found in chapters 1200-4-3, 0400-40-03, and 0400-40-04 of the General Water Quality Criteria. Designated use classifications for surface waters in the project area include domestic and industrial water supply, fish and aquatic life, recreation, livestock watering and wildlife, and irrigation (USEPA 2020). In addition, TDEC defines surface waters other than wet weather conveyances (i.e., ephemeral drainages) as Exceptional Tennessee Waters if they are located within certain areas, including state or national parks, wildlife refuges, forests, wilderness areas, or natural areas (TDEC 2019). New or increased discharges to Exceptional Tennessee Waters that would cause degradation of any available parameter above the level of de minimis (i.e., too minor to merit consideration) would only be authorized if the applicant has demonstrated to TDEC that there are no practicable alternatives to prevent or lessen degradation associated with the proposed activity (TDEC 2019). Sites that contain or are adjacent to a receiving stream designated as Exceptional Tennessee Waters also require a 60-foot natural riparian buffer zone be preserved to the maximum extent practicable (TDEC 2019).

The main sources of water quality degradation in the project area are potentially pathogenic bacteria and nutrient loading from nonpoint sources associated with existing agriculture, residential septic systems, and stormwater runoff (NPS 1994). Sediment loading from erosion and degradation associated with natural processes, agriculture (grazing), land development and disturbance, stream channel alteration, and stormwater runoff also affect existing surface waters. Field observation data from July 2019 (table 6) shows that water quality levels in Cove Creek are within the state criteria standards for dissolved oxygen, temperature, and pH (TDEC 2020a). For turbidity, TDEC specifies there shall be no turbidity or color in amounts or characteristics that cannot be reduced to acceptable concentrations by conventional water treatment processes. Turbidity levels in Wears Valley streams vary from lower levels in headwater streams to higher amounts in downstream areas of Cove Creek (TDEC 2020a).

TABLE 6. 2019 COVE CREEK WATER QUALITY DATA

Characteristic Name	2019 Level	Fish and Aquatic Life Criteria	Recreation Criteria	Irrigation Criteria	Livestock Watering and Wildlife Criteria
Dissolved Oxygen	9.26 milligrams per liter (mg/l)	not less than 5.0 mg/l	sufficient dissolved oxygen present to prevent odors and other offensive conditions	sufficient dissolved oxygen present to prevent odors and other offensive conditions	sufficient dissolved oxygen present to prevent odors and other offensive conditions
Temperature	22.19 degrees Celsius	not exceed 30.5 degrees Celsius	not exceed 30.5 degrees Celsius	shall not interfere with its use for irrigation	shall not interfere with its use for livestock watering and wildlife
pH	8.04	not outside 6.0 to 9.0	not outside 6.0 to 9.0	not outside 6.0 to 9.0	not outside 6.0 to 9.0

Source: TDEC 2020a; USEPA 2020

Overall, stream conditions in Wears Valley are good for fish and aquatic life, recreation, livestock watering and wildlife, and irrigation, but they are impaired to some degree and therefore, do not support all designated uses (TDEC 2020b). As required by Section 303(d) of the Clean Water Act, the state identifies surface waters that are not meeting their designated uses or are expected to exceed water quality standards in the next two years and need additional pollution controls. Downstream of the project area, Cove Creek is included on the 2020 303(d) list for *E. coli*, due to shoreline grazing and residential septic systems, and total maximum daily load priority is high (TDEC 2020b).

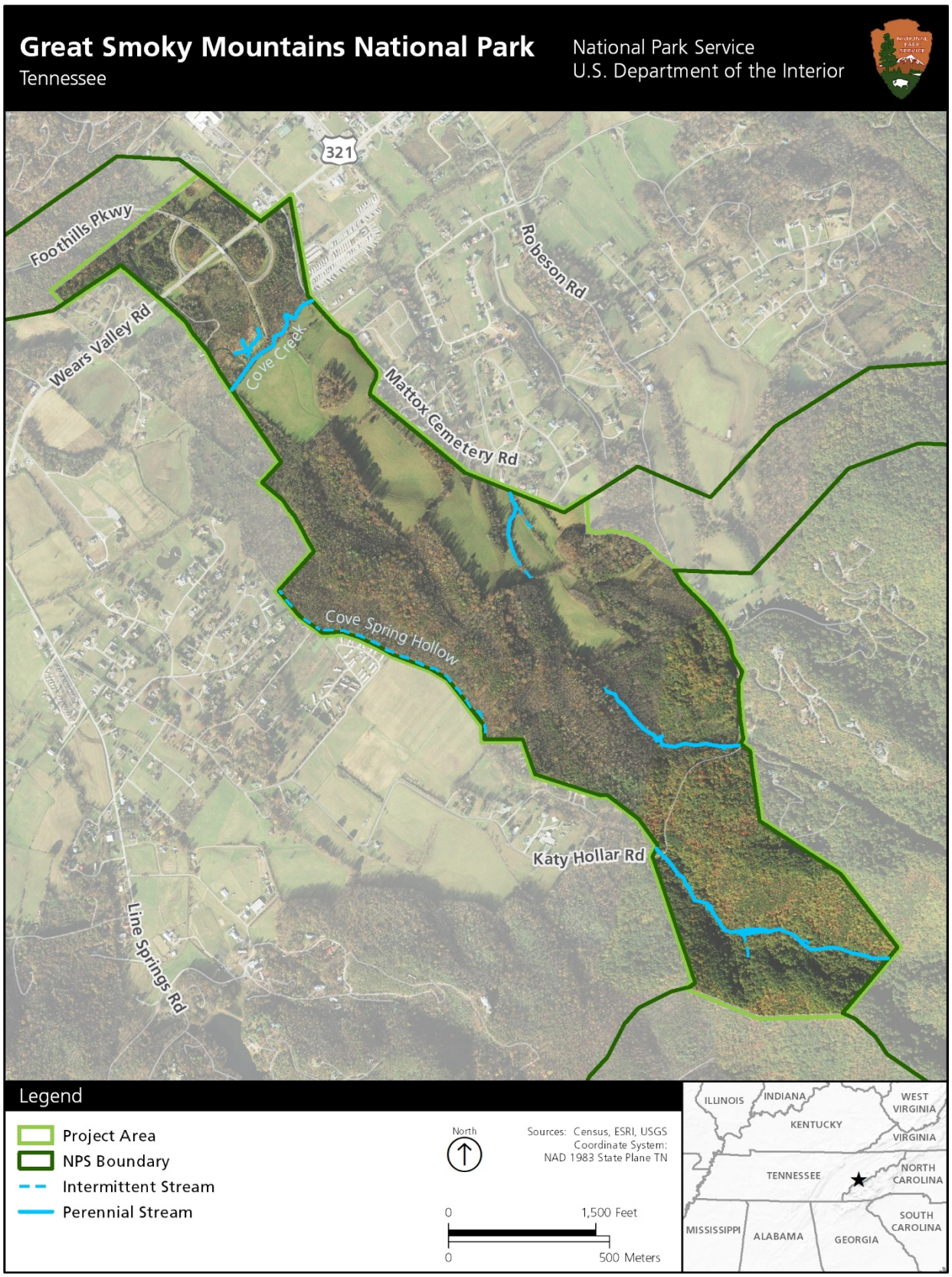


FIGURE 13. STREAMS IN THE PROJECT AREA

ENVIRONMENTAL CONSEQUENCES

Alternative 1—No Action

Under the no action alternative, there would be no change to the use of the project area. The open fields would continue to be used for hay production (approximately 66 acres) under a special use permit. Permit conditions, including restrictions on tilling, would continue to protect surface waters in the project area.

Alternative 2

Increased turbidity and sedimentation to downstream areas from the construction of the mountain bike trail system, access road, and trailheads could affect surface waters in the project area. As noted in the "Soils" section, alternative 2 would disturb 22.1 acres of soils, which could increase sedimentation to streams. A sediment and erosion control plan and requirements of a NPDES permit would minimize these impacts. Under alternative 2, the mountain bike trail system would require four perennial stream channel water crossings and a vehicular bridge over Cove Creek. Construction activities would include clearing and grading for the trail system and constructing boardwalks, wooden deck ladder bridges for perennial streams, or boulder causeways over drainage channels. Construction activities at water crossings could result in short-term increases of downstream turbidity levels from localized sediment disturbance. Trail design would require the construction of steel or wooden elevated structures to avoid and minimize disturbances, which could result in additional short-term impacts, including temporary partial flow diversions during construction; however, these structures would reduce the potential for long-term impacts, described below.

The incorporation of mitigation measures (e.g., sedimentation barriers) at water crossing sites throughout the construction process would minimize sediment releases in nearby surface waters, reducing potential impacts. Revegetating disturbed areas following construction would reduce the erosion potential of exposed soils; beginning and completing project construction activities during low-flow periods would further limit sediment releases into surface water resources. Construction activities would also require the use of petroleum and other chemicals. Inadvertent spills or leaks of petroleum or other chemicals associated with construction equipment could enter surface waters and degrade water quality. However, activities would adhere to an appropriate spill prevention control and countermeasures plan.

Operation of the mountain bike trail system could result in long-term sedimentation and water quality impacts to surface waters. Visitor use of the trails could widen trail surfaces, which would increase the potential for soil erosion and sediment transport to surface waters. The addition of 5.6 acres of new impervious areas and permanent loss of forest vegetation cover (13.3 acres) would lead to increased surface water runoff from the project area, which could increase pollutant loadings in streams. Buffers between stream channels and the proposed access road and trailhead would limit the overall impact of new impervious areas on the project area watershed; however, the increased storm runoff would be long term and have small, localized impacts.

The trail system would be designed to maintain an average 60-foot buffer away from streams, reducing the potential for surface water impacts. Elevated structures at perennial water crossings would use a low-impact approach, likely relying on a pier support system to provide an elevated trailway and/or bridge structure where terrain is more ravine-like to further reduce potential impacts. Some areas prone to moisture, such as ephemeral drainages, could include an at-grade trail reinforcement strategy, such as a slightly elevated rock-armored trail surface paired with drainage pipes to allow peripheral surface drainage to escape. Surface water impacts at trail water crossings would be further minimized by using narrow crossing locations to minimize disturbance to the extent practicable. To minimize increased sedimentation into surface waters, sustainable design concepts would be used to quickly eliminate water from the trail system after a rain event, which would reduce the potential for standing water and soil erosion and subsequent increased sedimentation. Routine trail and road maintenance would also minimize erosion issues associated with visitor use and natural processes.

In addition to use of the trails, alternative 2 would include a subsurface sewage disposal system at each trailhead to treat wastewater from the restrooms. The specific type of treatment system and size of the associated drain fields would be defined during the project design process based on site-specific soil and geotechnical surveys in consultation with TDEC. Assuming a conventional septic system is appropriate for the site, the drain fields would be approximately 5,000 square feet (0.11 acres). The septic fields would be situated near the developed trailheads in open, non-forested areas and outside floodplains and buffers for wetlands.

Overall, the project's construction and operation under alternative 2 would result in short-term (localized sedimentation during construction) and long-term (stormwater runoff from new impervious areas), adverse impacts on water resources in Wears Valley. The project stormwater plan and erosion control plan would include applicable TDEC stormwater construction permit conditions (i.e., NPDES regulations), and the detailed design of the project would incorporate specific stormwater control measures that could include rain gardens, infiltration systems, and bioswales (TDEC 2020c). The trail system would be designed to quickly eliminate water from the trails. This design, combined with the buffers from surface waters and siting of the septic systems, would maintain surface water quality in the project area during operation similar to the existing water quality conditions presented in table 5. Alternative 2 would not likely result in water quality levels outside the limits of the designated uses for surfaces water resources in Wears Valley.

Cumulative Impacts. Past development of Parkway Section 8E and continued increased residential development, including the increase in septic systems, in Wears Valley have removed vegetation and soil outside the project area, resulting in short-term, adverse impacts on water resources from disturbance and pollutant loading. In addition, new paved areas, including the potential development of Parkway Section 8D would increase the amount of impervious area in Wears Valley and contribute to additional stormwater runoff in certain areas.

Alternative 2 would contribute adverse impacts on surface waters in the planning area from sedimentation from trails and stormwater runoff from new impervious areas. When the incremental impacts from alternative 2 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on water resources would be adverse, with the incremental impacts of alternative 2 contributing limited to no impacts. The primary driver of adverse cumulative impacts would continue to be actions related to agriculture (grazing) and on-site residential septic disposal in the vicinity of the project area.

Alternative 3—NPS Preferred Alternative

Impacts on surface waters under alternative 3 would be similar to those described under alternative 2. Under alternative 3, the mountain bike trail system would cross the same number of stream channels as alternative 2, but the proposed access road length would increase to 0.93 miles and total disturbance would be 25.2 acres. While the access road would result in additional impervious surface, this alternative would only include one trailhead. As a result, total impervious surface would be 5.7 acres, 0.1 acre more than alternative 2. The addition of a pedestrian trail and the location of the trailhead would also increase the total acres of forest removal by approximately 1 acre to 14.3 acres.

Impacts related to operations and maintenance of the mountain bike trail system, access road, and trailhead, would be similar as those described for alternative 2. However, because alternative 3 would include only one trailhead located at the end of the proposed access road, only one septic system would be required. The required septic field at the trailhead under alternative 3 would not be located near (<150 feet) Cove Creek, which would minimize the potential for the lateral transfer of septic runoff into the stream described under alternative 2.

Overall, alternative 3 would result in similar to slightly greater impacts on surface waters compared to alternative 2 because of the slight increase in impervious surface (stormwater runoff) and additional forest

clearing. While alternative 3 would result in approximately 3 acres of additional disturbance in the project area, primarily from the construction of pedestrian trails, the amount of new impervious surface would be 0.1 acre more than alternative 2. Impacts from stormwater runoff under alternative 3 would be long term, the same as described for alternative 2. Impacts on surface waters from pervious surface under alternative 3 would result in the same type of impacts described for alternative 2, but these impacts would be greater because of the additional acres associated with the trail. In addition, approximately 2.5 acres of additional temporary disturbance would occur from cut and fill associated with the longer roadway. The increase in disturbance and the mountain bike trail system's footprint could result in increased sedimentation to downstream areas. However, like alternative 2, construction mitigation measures would minimize sedimentation, and impacts would be short term and likely localized to construction areas. Also like alternative 2, trail design, surface waters buffers, and the siting of the septic system would ensure surface water quality in the project area during operation would remain similar to the existing water quality conditions presented in table 6. Alternative 3 would not likely result in water quality levels outside the limits of the designated uses for surfaces water resources in Wears Valley.

Cumulative Impacts. Impacts on surface waters from cumulative projects would be the same as those described for alternative 2. Alternative 3 would contribute adverse impacts on surface waters from increased visitation to the area, sedimentation from trails, and stormwater runoff from new impervious areas. When the incremental impacts from alternative 3 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on water resources would continue to be adverse, with the incremental impacts of alternative 3 contributing limited to no impacts.

Alternative 4

Impacts on surface waters under alternative 4 would be similar to those described under alternatives 2 and 3, but to a smaller degree because of the alternative's smaller footprint and area of disturbance (11.6 acres). Under alternative 4, the mountain bike trail system would cross three perennial stream channel water crossings and one intermittent stream channel water crossing, which would reduce the intensity of impacts on surface waters from the trail system compared with alternatives 2 and 3. Additionally, the proposed access road would be 0.32-miles and would still require one crossing over Cove Creek. With only one trailhead and a shorter access road, total impervious surface would be 2.2 acres, limiting the amount of stormwater runoff compared with alternative 2. The smaller footprint of the trail system would also limit forest clearing to 6.4 acres.

Impacts related to operations and maintenance of the mountain bike trail system, access road, and trailhead would be similar as those described for alternative 2. Alternative 4 would place one septic field relatively near (<150 feet) Cove Creek, which could cause lateral transfer of septic runoff (i.e., nutrients, *E. coli*, fecal coliform) to the stream. However, the septic system would be designed to prevent adverse effects on water quality in Cove Creek, as described under alternative 2.

Overall, impacts on surface waters related to alternative 4 would be similar to those described for alternative 2 but with less intensity because this alternative would include less impervious surface (stormwater runoff) and require less forest clearing. Impacts from stormwater runoff under alternative 4 would be long term, the same as described for alternative 2. The increase in disturbance and the mountain bike trail system's footprint could result in increased sedimentation to downstream areas. However, like alternative 2, construction mitigation measures would minimize sedimentation, and impacts would be short term and likely localized to construction areas. Like alternative 2, trail design, surface water buffers, and siting of the septic system would ensure surface water quality in the project area during operation would remain similar to the existing water quality conditions presented in table 5. Alternative 4 would not likely result in water quality levels outside the limits of the designated uses for surfaces water resources in Wears Valley.

Cumulative Impacts. Impacts on surface waters from cumulative projects would be the same as those described for alternative 2. Alternative 4 would contribute adverse impacts on surface waters from

increased visitation to the area, sedimentation from trails, and stormwater runoff from new impervious areas. When the incremental impacts from alternative 4 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on water resources would continue to be adverse, with the incremental impacts of alternative 4 contributing limited to no impacts.

VEGETATION

AFFECTED ENVIRONMENT

Approximately 74% of the 425-acre project area consists of forest cover, 21% is composed of open field, and 2% is composed of wetlands. As noted in chapter 2, the open fields are currently maintained by haying under a special use permit. The remaining 3% of the project area is developed land, including the previously graded portion of Parkway Section 8D and developed infrastructure, such as Katy Hollar Road. Land cover categories in the project area were identified using 2016 National Land Cover Database spatial data with appropriate modifications based on field observations. Figure 2 shows the distribution of forests and open fields across the project area.

Forests within the project area fall into three major types: pine/oak, oak/hickory, and successional. Forests in the project area have an average overall canopy closure of 75%–95%, with a low to medium density of shrubs in the understory. Forest stands are composed primarily of trees between 9 and 15-inches diameter at breast height (NPS 2020a).

Oak/hickory forest is the most common forest type in the Park, covering approximately 31% of the total forest cover (Jenkins 2007). Specific to the project area, oak/hickory forests are variable, ranging from the drier chestnut oak subxeric ridge forests that co-occur with pine/oak, to the wetter and much more diverse rich low-elevation Appalachian oak-hickory forests found on the lower slopes of the project area over Jonesboro limestone geology. Overall, these forests are dominated by oak species (scarlet [*Quercus coccinea*], black [*Quercus velutina*], chestnut [*Quercus montana*] eastern white [*Quercus alba*], northern red [*Quercus rubra*], and chinkapin [*Q. muehlenbergii*]). Hickory (*Carya*) species, red maple (*Acer rubrum*), white ash (*Fraxinus Americana*), and a variety of other deciduous hardwoods co-dominate at times. The understory is dense with ericaceous shrubs (mountain laurel [*Kalmia latifolia*], rhododendron [*Rhododendron maximum*], huckleberries [*Gaylussacia spp.*], and blueberries [*Vaccinium spp.*]) where these forests occur on dry ridgetops. The understory is sparser and more diverse in more mesic (moderately moist) situations lower on the slope. The herbaceous layer in the mesic areas over limestone can be diverse, with baneberries (*Actaea spp.*), mayapple (*Podophyllum peltatum*), and stoneroot (*Collinsonia canadensis*) being common species.

Pine/oak forests occur on the more exposed and drier ridgelines in the project area, including the southern project boundary near Little Brier Gap and on top of knobs in the lower valley. Pine/oak forests are generally a mixed forest with Virginia pine (*Pinus virginiana*), pitch pine (*Pinus rigida*), Table Mountain pine (*Pinus pungens*), scarlet oak, black oak, and chestnut oak common in the canopy. The understory of these forests is generally dense with common shrubs like mountain laurel, greenbriers (*Smilax spp.*), huckleberries, and blueberries. The herbaceous layer is sparse is most places.

Successional stands within the project area are defined by species assemblages that have returned after intensive human disturbance, such as logging, farming, or settlement. These stands generally lack oak and hickory species and are instead dominated by ruderal (early colonizing), fast growing species. The project area contains three types of successional forests: successional Virginia pine forests, successional tuliptree forests, and successional mixed hardwoods. Successional mixed hardwoods can include a wide range of ruderal species, such as tuliptree (*Liriodendron tulipifera*), black gum (*Nyssa sylvatica*), Fraser magnolia (*Magnolia fraseri*), sourwood (*Oxydendron arboreum*), and sweetgum (*Liquidambar styraciflua*). Successional forest can vary widely in species assemblage and diversity based on slope position and land use history, with pine-dominated stands generally being species-poor and hardwood-dominated stands

having more diversity. Where these stands occur over limestone, species diversity can be quite high in the understory and herbaceous layer.

No federally or state listed threatened or endangered plant species are found within the project area. The US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation tool identified spreading avens (*Geum radiatum*) as the only federally listed plant species identified as potentially occurring in the project area. This plant occurs in a highly specialized habitat of high-elevation crevices (>4,300 feet) on northwest-facing cliffs. The project area lacks suitable habitat, and the one population known to exist in the Park occurs outside the project area (NPS 2020a).

Twenty-one non-native invasive plant species occur in the project area. Most of these infestations are located in the northern and central portions of the project area (figure 14). High infestations of European privet (*Ligustrum vulgare*), Japanese honeysuckle (*Lonicera japonica*), Nepalese browntop (*Microstegium vimineum*), reed canary grass (*Phalaris arundinacea*), and multiflora rose (*Rosa multiflora*) are also found in the project area (NPS 2020a).

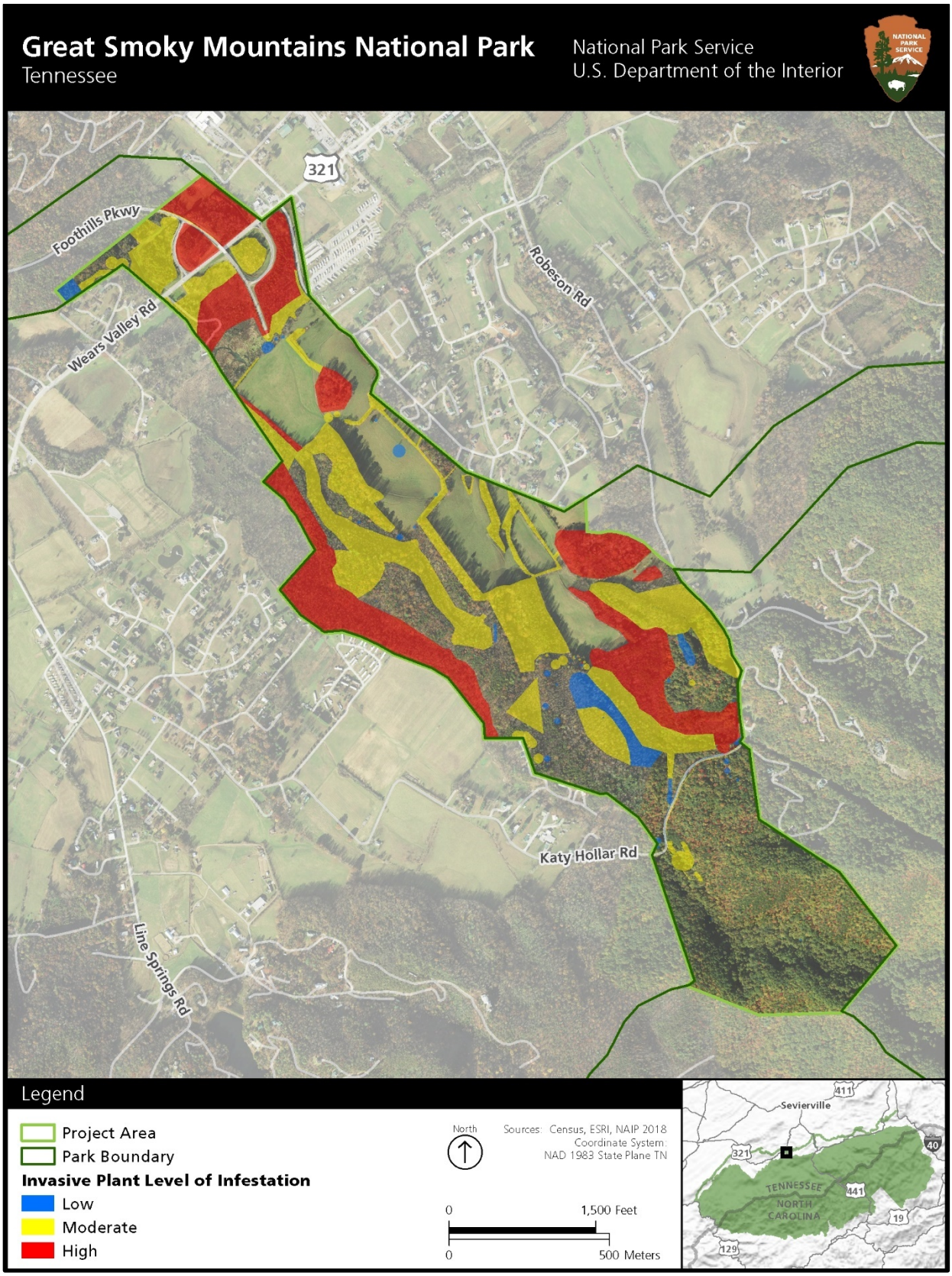


FIGURE 14. LEVEL OF INFESTATION BY NON-NATIVE INVASIVE PLANT SPECIES

ENVIRONMENTAL CONSEQUENCES

Alternative 1—No Action

Under the no action alternative, there would be no change to the use of the project area. The open fields would continue to be used for hay production (approximately 66 acres) under a special use permit. Therefore, no impacts on vegetation are anticipated. Vegetation in the project area would continue to be influenced by existing agriculture and limited visitor use.

Alternative 2

Under alternative 2, construction of the mountain bike trail system, access road, and trailheads would require approximately 21.2 acres of total vegetation removal and would adversely affect vegetation in the project area. Table 7 provides the acres of impact by land cover type.

Of the total disturbance, 13.3 acres of forest removal, most of this acreage (9.6 acres) would be for trail construction, and the trail surface would be maintained unvegetated. As described in chapter 2, the 9.6 acres assumes a 4-foot vegetation clearing for the easy trails, 6 feet for moderate trails, and 10 feet for advanced trails. In these locations, the disturbed area outside the trail surface would be revegetated; however, existing trees or ground vegetation would be disturbed during construction. Affected tree species would be primarily in areas where red oak, chestnut oak, and tulip tree are dominant. The removal of large-diameter trees would be avoided wherever possible, especially for the trails, where the exact trail alignment could be modified during construction to avoid large-diameter trees to reduce the loss of forest cover. In the area of the south trailhead, the forest is dominated by white oak, tulip tree, and red maple, and diameter at breast height averages 30 inches. An old roadbed, containing early successional vegetation, exists approximately 30 feet from the tree line. Other tree species observed in the project area were red oak, dogwood (*Cornus florida)*, black locust (*Robinia pseudoacacia*), black gum, red bud (*Cercis canadensis*), sassafras (*Sasafras albidum*), eastern hemlock (*Tsuga canadensis*), beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), and black walnut (*Juglans nigra*). If alternative 2 were selected for implementation, the exact location of this trailhead would be examined to avoid impacts to large-diameter trees to the extent possible.

TABLE 7. IMPACTS ON VEGETATION–ALTERNATIVE 2

Land Cover/Type of Impact	Acres	Percent of Land Cover in Project Area
Forest - Temporary	2.1	0.7%
Forest - Permanent	11.2	3.5%
Forest - Total	**13.3**	**4.2%**
Open Field - Temporary	2.5	2.7%
Open Field - Permanent	5.4	6.1%
Open Field - Total	**7.9**	**8.8%**

While alternative 2 would remove 13.3 acres of forest cover, this acreage would account for approximately 4.2% of the total forest cover in the project area. Forest removal associated with the mountain bike trail system would occur in narrow corridors (4- to 10-feet wide). A portion of these areas would be revegetated after construction; however, to maintain a safety zone around the trail system, the area would not be revegetated as forest cover. While ground cover and shrubs would return, trees would not grow in the safety zone and would constitute a permanent change to forest cover in these locations. As a result, the forest canopy may become more open due to selective removal of trees, but the trail corridor would be maintained with native groundcover and shrubs. Alternative 2 would affect 7.9 acres of open

fields, which accounts for 8.8% of the total open fields in the project area. Temporarily disturbed areas would be reseeded after construction, resulting in permanent impacts on 5.4 acres of open field, and the open field setting would be maintained through continued haying or annual mowing.

Non-native invasive plants, including those with high levels of infestation, such as European privet, Japanese honeysuckle, Nepalese browntop, reed canary grass, and multiflora rose, occur in areas that would be disturbed during project construction, which could increase their spread in open fields in the central portion and the forests in the southern portion of the project area. Exposed soils provide favorable conditions for seed germination that could facilitate the spread of these non-native invasive plants. Invasive species can compete with native species and alter the composition of vegetation species over the long term.

Visitor use of new trails could also result in the spread of non-native invasive plants. As demonstrated in figure 14, few invasive species grow in the portion of the project area south of Katy Hollar Road. Construction and use of mountain bike trails in this area would likely spread invasive species here. However, the mitigation measures detailed in chapter 2 would be followed to avoid the spread of non-native invasive plants in areas disturbed by construction activities. For example, ground-disturbing activities would require pre-construction invasive plant treatment and removal and post-construction monitoring, and users would be encouraged to wash their bikes prior to using the trail system. Also, disturbance to native plant communities would be minimized, where possible. With such measures in place, alternative 2 would provide an opportunity to remove non-native invasive plants in the project area before ground-disturbing activities, and following construction, to restore healthy plant communities in accordance with the project-specific restoration plan. Upon completion of construction, temporarily disturbed areas would be revegetated to avoid and minimize the spread of non-native invasive plants and prevent spread into nearby areas of the Park.

Additional long-term, adverse impacts on vegetation could occur from visitor trampling or creation of social (i.e., informal) trails not designated for foot or bicycle traffic. Visitor education via signage and implementation of mitigation measures and visitor use management strategies, including the potential creation of physical barriers consisting of native materials to prevent trail widening and discourage social trail use, would minimize the creation of social trails and the widening or braiding of constructed trails.

Overall, alternative 2 would maintain a mix of forest cover and open fields. Open fields would continue to be managed by haying under a special use permit or mowing to prevent conversion to forest through ecological succession, while natural processes would predominate in forests. Alternative 2 would result in direct, short- and long-term, adverse impacts from the construction of road surfaces, trailheads, mountain bike trails, and the potential spread of non-native invasive species. In the context of the surrounding landscape, species composition in the project area would not change under alternative 2 but would slightly reduce the tree canopy near trailheads.

Cumulative Impacts. Past development of Parkway Section 8E and continued increased residential development in Wears Valley have disturbed or removed vegetation outside the project area, resulting in long-term, adverse impacts on vegetation. Construction of the final portion of Section 8E removed or altered approximately 12 acres of forest cover within the last 10 years. In addition, new construction, including the potential development of Parkway Section 8D could remove additional acres of forest cover in and around the project area. These projects have or would contribute to the removal of additional forest cover and result in long-term, adverse impacts.

Alternative 2 would contribute an additional 22.3 acres of adverse impacts on vegetation in the project area from the conversion of native vegetation to a mountain bike trail system, access road, and trailheads. When the incremental impacts from alternative 2 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on vegetation would be adverse. The primary driver of adverse cumulative impacts would continue to be actions related to residential and roadway development outside the project area.

Alternative 3—NPS Preferred Alternative

Like alternative 2, alternative 3 would affect vegetation in the project area during construction of the mountain bike trail system, access road, and trailhead. However, impacts on vegetation would be greater under alternative 3 because more vegetation would be removed during construction or converted to impervious surfaces. Construction of alternative 3 would require 24.4 acres of vegetation removal.

Impacts on vegetation would be the same as those described for alternative 2, but to a greater extent. Table 8 provides the acres of impact by land cover type. Approximately 14.3 acres of forest would be cleared—1.0 acres more than under alternative 2. Approximately 9.9 acres of open fields would be removed—2.0 acres more than under alternative 2. However, approximately half of open field removal (4.8 acres) would be from temporary disturbance, which would be revegetated in accordance with the project-specific restoration plan. Temporarily disturbed areas would be reseeded after construction, and the open field setting would be maintained through continued haying or annual mowing. Under alternative 3, the trail would be in the same general vicinity as alternative 2 and is be anticipated to affect similar species. Large-diameter trees would be avoided to the extent possible. The mitigation measures detailed in chapter 2 would be followed to avoid the spread of non-native invasive plants and to ensure that native vegetation is adequately reclaimed in areas disturbed by construction activities.

Impacts from operation and maintenance of the trails including the potential spread of invasive species and trampling would be the same as described under alternative 2.

TABLE 8. IMPACTS ON VEGETATION–ALTERNATIVE 3

Land Cover/Type of Impact	Acres	Percent of Land Cover in Project Area
Forest - Temporary	2.4	0.8%
Forest - Permanent	11.9	3.8%
Forest - Total	**14.3**	**4.6%**
Open Field - Temporary	4.8	5.3%
Open Field - Permanent	5.1	5.8%
Open Field - Total	**9.9**	**11.1%**

While 14.3 acres of forest cover would be removed, this acreage would account for approximately 4.6% of the total forest cover in the project area. While 5.1 acres of open fields would be permanently affected under alternative 3, this acreage would account for less than 8% of the total open fields in the project area.

Overall, alternative 3 would result in direct, short- and long-term, adverse impacts from the removal of forest and open field land cover and from the potential spread of non-native invasive species. In the context of the surrounding landscape, species composition in the project area would not change under alternative 3 but would slightly reduce the tree canopy near the trailhead.

Cumulative Impacts. Impacts on vegetation from other actions would be the same as those described for alternative 2. Alternative 3 would contribute 24.2 acres of adverse impacts on vegetation in the project area from conversion of native vegetation to a mountain bike trail system, access road, and trailhead. When the incremental impacts from alternative 3 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on vegetation would be adverse. The primary driver of adverse cumulative impacts would continue to be actions related to residential roadway development outside the project area.

Alternative 4

Alternative 4 would have the same type of impacts on vegetation as described under alternative 2, but to a lesser extent because alternative 4 would have a much smaller footprint. Table 9 provides the acres of impact by land cover type. Impacts on vegetation would be less intense than those described for alternatives 2 and 3 because alternative 4 would remove approximately half the vegetation as alternatives 2 and 3, particularly in the forested areas in the southern portion of the project area. Alternative 4 would require 10.6 acres of vegetation removal during construction.

No permanent forest removal would be required for the trailhead under alternative 4, but 0.3 acres would be temporarily removed by earthmoving activities. Approximately 4.2 acres of open fields would be affected; all but 0.4 acres would be permanently removed. Alternative 4 would better protect the portion of the project area south of Katy Hollar Road from the potential spread of invasive species because no construction or trail development would occur in this area.

TABLE 9. IMPACTS ON VEGETATION–ALTERNATIVE 4

Land Cover/Type of Impact	Acres	Percent of Land Cover in Project Area
Forest - Temporary	0.3	0.1%
Forest - Permanent	6.1	2.0%
Forest - Total	**6.4**	**2.1%**
Open Field - Temporary	0.4	0.5%
Open Field - Permanent	3.8	4.2%
Open Field - Total	**4.2**	**4.7%**

While 6.4 acres of forest cover would be removed, this acreage would account for 2.1% of the total forest cover in the project area. Most of this acreage (6.1 acres) would be related to the mountain bike trail system, which would result in narrow corridors of forest removal and a potentially more open tree canopy, as described under alternative 2. Approximately 4.2 acres of open fields would be affected under alternative 4, which would account for approximately 4.7% of the total open fields in the project area. Where temporary impacts occur, the area would be revegetated as open field and maintained through continued haying or annual mowing.

Similar to alternatives 2 and 3, additional mitigation measures detailed in chapter 2 would be followed to avoid the spread of non-native invasive plants and to ensure that native vegetation is adequately reclaimed in areas disturbed by construction activities.

Overall, alternative 4 would result in direct, short- and long-term, adverse impacts from the removal of forest and open field land over and from the potential spread of non-native invasive species. However, direct long-term, beneficial impacts on vegetation would also occur from removal of non-native invasive vegetation, revegetation, and maintaining a mix of open fields and forests. In the context of the surrounding landscape, species composition in the project area would not change under alternative 3, but would slightly reduce the tree canopy near the trailhead.

Cumulative Impacts. Impacts on vegetation from other actions would be the same as those described for alternative 2. Alternative 4 would contribute 10.6 acres of adverse impacts on vegetation in the project area from conversion of native vegetation to a mountain bike trail system, access road, and trailhead. When the incremental impacts from alternative 4 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on vegetation would be adverse. The primary driver of adverse cumulative impacts would continue to be actions related to residential and roadway development outside the project area.

VISITOR USE AND EXPERIENCE

AFFECTED ENVIRONMENT

The Park is one of the most visited park units in the national park system with more than 10 million annual visitors since 2014 and 12.5 million visitors in 2019 (NPS 2020b). As a result of high visitation, the Park experiences congestion and crowding, especially on popular trails and visitor areas, like Cades Cove.

Biking is a regular activity in the Park, but detailed data on bike use are limited. Data collection for bike use is only collected for the Cades Cove Loop Road during vehicle-free mornings (Wednesdays and Saturdays), as described under the cumulative project descriptions. The number of visitors biking in this area ranged from 16,000 to 21,000 per season from 2015 to 2019; however, this high level of participation in biking does not occur elsewhere in the Park (NPS 2020c). While Parkwide statistics for bike use do not exist, the Cades Cove data indicate that biking is a popular activity and suggest that overall bike use in the Park has increased over time. It is also reasonable to assume that bike use is increasing Parkwide based on the upward trend in annual visitation. Biking is authorized on approximately 8 miles of trails within the Park and on all Park roads. Within the Park road network, 40 miles of roads that are seasonally closed to motor vehicles remain open to bicycle use year-round.

Visitor opportunities in the project area include wildlife watching, photography, and other passive recreational activities. The project area does not contain developed visitor services such as parking, restrooms, or designated trails; however, the nearly 5-acre wetland located near the intersection of Parkway Sections 8E and 8D as well as the open fields are used for birding.

Portions of two popular hiking trails are adjacent to the southern end of the project area. The Little Brier Gap Trail is approximately 1.4-miles long and connects from Little Greenbrier School to Little Brier Gap and is a popular route for accessing the Walker Sisters Farmstead. The second trail, Little Greenbrier Trail, can be accessed from the trailhead located on Wear Cove Gap Road at the Park boundary. The trail also leads to Chinquapin Ridge outside the project area and offers views into Wears Valley.

ENVIRONMENTAL CONSEQUENCES

Alternative 1—No Action

Under the no action alternative, no changes would be made, and the project area would continue to provide passive recreational opportunities.

Alternative 2

Under alternative 2, Park visitors would experience beneficial impacts from the addition of a new recreation type. The development of the mountain bike system could increase visitation, but it may also contribute to distributing visitation from congested areas in the Park, such as Cades Cove, which could reduce visitation pressure in other areas of the Park. To calculate estimated visitation for the mountain bike trail system this analysis uses the following assumptions:

- All periods assume 4 hours per visitor trip and 12-hour visitor days, or three full cycles of the PAOT capacity provided in chapter 2
- 100% capacity for weekends during the summer peak visitation period (3 months)
- 50% capacity for weekdays during the summer peak visitation period (3 months)
- 50% capacity for weekends during the shoulder season (6 months)
- 25% capacity for weekdays during the shoulder season (6 months)
- 25% capacity for both weekends and weekdays during the off-peak visitation period (3 months)

Using these assumptions and the PAOT trail capacity estimate for alternative 2, the estimated annual visitation would be approximately 81,000 visitors. This number includes both existing Park visitors and new visitors, so it is unknown what the total increase to overall Park visitation would be; however, it would be small compared to the overall 12.5 million annual visitors. To manage congestion, the Park would implement the management strategies and mitigation measures included in appendix B, including visitor dispersal and parking enforcement. If crowding and congestion continued, NPS could consider implementing a reservation system or increasing trail capacity by expanding the mountain bike trail system in adjacent portions of the Section 8D corridor under a separate NEPA process.

Under alternative 2, the trail system would be designated for mountain bike use to minimize conflicts between cyclists and pedestrians. The trail system would include similar lengths of easy, moderate, and advanced trails lengths, which would allow riders of all skill levels to enjoy the trail system. The trail system would also include open field and forested trails for a diversity of experience. The advanced trail section would cross Katy Hollar Road in two locations. While Katy Hollar Road is not a busy thoroughfare, the trail crossings could present safety concerns given the line-of-sight constraints based on topography and turns in the road. Mountain bikers would be asked to dismount and walk their bikes across the road after confirming no vehicles are present, which would reduce the potential for safety conflicts. There would also be bike crossing signs for vehicles on Katy Hollar Road.

Visitors using the hiking trails adjacent to the project area may hear noise associated with the mountain bike trail users, which could result in adverse impacts on these users compared with current conditions. These impacts would be most noticeable during construction and during operation at Little Brier Gap where the existing Park trails would be closest to the proposed mountain bike trail system. In this location, steep topography would keep the trails physically and visually separate, which would deter or prevent mountain bikers from accessing the existing trails. This analysis assumes that all visitors obey the rules and regulations of the Park and stay on the appropriately designated trail.

Construction of the access road and bridge could adversely affect the current visitor experience for birding in the area in the short term during the construction period when the area would likely be closed and in the long term from the presence of the new bridge, vehicles, and trails. Additionally, birders currently use the existing roadbed adjacent to the wetland as a platform for viewing. This opportunity would no longer exist under alternative 2 because the roadbed would be an active roadway.

Overall, alternative 2 would result in long-term, beneficial impacts on visitors who desire a purpose-built mountain bike trail system. Short- and long-term, adverse impacts on birders and hikers who currently use the project area and surrounding trail network would experience additional auditory intrusions compared to current conditions.

Cumulative Impacts. Current and future projects with the potential to contribute cumulative impacts on visitor use and experience include the existing vehicle-free pilot study at Cades Cove and the potential future development of Parkway Section 8D, a proposed Cocke County mountain bike trail system, the Vee Hollow Mountain Bike Trail System, the Metcalf Bottoms Access Improvements, and the Gatlinburg Spur Greenway. The Cades Cove pilot study, Cocke County's mountain bike trail system, and Gatlinburg Spur Greenway project would provide additional opportunities for visitors to experience the Park and general Park vicinity by bicycle and outside their vehicles, which would improve visitor experience. The Gatlinburg Spur Greenway would potentially develop a trail from Pigeon Forge to Gatlinburg, enabling visitors to get around more easily without a vehicle. Look Rock Campground rehabilitation would reopen a visitor use area along the Parkway, which would benefit Parkway users. Parkway Section 8D and the Metcalf Bottoms Access Improvement projects could reduce congestion pressures on existing roadways or entrances and provide safer access to the Park. Parkway Section 8D would complete the connection between the Gatlinburg Spur and the Parkway to the west, while the access improvements could improve access and circulation issues along Wear Cove Gap Road into Metcalf Bottoms. All cumulative projects are intended to have long-term, beneficial impacts on visitor use and experience. Project-specific

analyses, which are not available at this time, would be required to determine how each of these projects would affect overall Park visitation.

Alternative 2 would have beneficial impacts on visitor use and experience from the development of a new recreational opportunity in the Park, but it would also adversely affect the current birding experience. When the incremental impacts from alternative 2 are combined with the impacts from present and reasonably foreseeable actions, the overall cumulative impact on visitor use and experience would be beneficial with the incremental impacts of alternative 2 contributing noticeable beneficial impacts.

Alternative 3—NPS Preferred Alternative

Impacts on visitor use and experience under alternative 3 would be similar to those described under alternative 2; however, alternative 3 would include a designated pedestrian trail that would increase the total miles of trails. Alternative 3 would also maintain both open field and forested trails as well as a variety of trails for varying skill levels and user types but would provide additional miles of easy trails for beginners. Alternative 3 would provide one trailhead location with the same amenities and potential for a concessions/bike rental space as described under alternative 2, which would benefit all users of the trail system. Using the same assumption under alternative 2, estimated annual visitation would be approximately 75,000 under alternative 3. The same congestion management strategies would be used under alternative 3.

Adverse impacts on visitor use and experience would be the same as described under alternative 2. Overall, alternative 3 would result in long-term, beneficial impacts on visitors who desire a purpose-built mountain bike trail system and would have short- and long-term, adverse impacts on birders and hikers who currently use the project area and the surrounding trail network. There would be additional beneficial impacts under alternative 3 from the addition of a pedestrian-only trail, which would provide additional visitor uses in the project area.

Cumulative Impacts. Impacts on visitor use and experience from cumulative projects would be the same as those described for alternative 2. Alternative 3 would contribute both beneficial and adverse impacts on visitor use and experience from the development of a new recreational opportunity in the Park, but it would also adversely affect the current birding experience. When the incremental impacts from alternative 3 are combined with the impacts from present and reasonably foreseeable actions, the overall cumulative impact on visitor use and experience would be beneficial with the incremental impacts of alternative 3 contributing noticeable beneficial impacts.

Alternative 4

Impacts on visitor use and experience under alternative 4 would be similar to those described under alternative 3; however, alternative 4 would not include any trails in the portion of the project area with the steepest topography, which would limit the advanced trail miles and reduce the mountain bike trail capacity relative to alternatives 2 and 3. Alternative 4 would still provide a variety of trails for varying skill levels, but these trails would have a smaller footprint and would not cross Katy Hollar Road, thereby eliminating the potential safety concern identified under alternatives 2 and 3. Similar to alternative 3, alternative 4 would provide one trailhead location for both mountain bike and hiker trails, which would benefit visitor experience in the project area. Alternative 4 would include similar amenities described under alternative 2 but would not include the potential for concessions/bike rental space. Using the same assumption under alternative 2, estimated annual visitation would be approximately 54,000 under alternative 4. The same congestion management strategies would be used under alternative 4.

Because no mountain bike trails would be located near Little Brier Gap, hikers on the existing trails in the Park would not experience adverse effects during construction or operation of the trail system. Overall, alternative 4 would result in long-term, beneficial impacts on visitors who desire a purpose-built mountain bike trail system but would also result in short- and long-term, adverse impacts on birders who currently use the project area.

Cumulative Impacts. Impacts on visitor use and experience from cumulative projects would be the same as those described for alternative 2. Alternative 4 would contribute both beneficial and adverse impacts on visitor use and experience from the development of a new recreational opportunity in the Park, but it would adversely affect the current birding experience. When the incremental impacts from alternative 4 are combined with the impacts from present and reasonably foreseeable actions, the overall cumulative impact on visitor use and experience would be beneficial with the incremental impacts of alternative 4 contributing noticeable beneficial impacts.

WILDLIFE, INCLUDING THREATENED AND ENDANGERED SPECIES

AFFECTED ENVIRONMENT

The project area contains a diversity of wildlife species and habitats. However, for the purposes of this EA, discussion of wildlife focuses on three groups of species that could be affected under the action alternatives: birds, bats, and black bears. Wildlife habitats in the project area include pine/oak, oak/hickory, and successional forest; open fields; and wetlands and riparian habitats. Deciduous forest makes up approximately half of the project area.

Birds

The project area provides habitat that supports a diversity of avian species. An estimated 240 species of birds have been documented in the Park; approximately half those species also breed in the Park (NPS 2019a). A list of the birds that may occur in the project area, based on confirmed and accepted occurrences in the NPSpecies database (NPS 2019b), is provided in appendix G. Approximately half (118) of these species are very likely to occur in the project area based on point surveys or eBird (2020) occurrences. Of these 118 species, 106 species are either resident or known to breed in the Park and 12 are found only during migration. Point-count surveys in June 2020 documented 65 bird species within an area that extended beyond the project area into the Metcalf Bottoms section of the Park; therefore, all 65 species may not occur in the project area. The eBird (2020) database documents 110 bird species, including 54 species not found during the point-count surveys. Appendix G also provides the relative abundance, breeding/residence status, preferred habitat types(s), and any special status of each bird species.

Around 60 bird species are year-round residents in the Park, including red-tailed hawk (*Buteo jamaicensis*), barred owl (*Strix varia*), wild turkey (*Meleagris gallopavo*), dark-eyed junco (*Junco hyemalis*), and Carolina chickadee (*Poecile carolinensis*). Many birds use Wears Valley as an important stopover and foraging area during their semiannual migration (NPS 2019a).

No bird species listed as threatened or endangered under the Endangered Species Act (ESA) or by the State of Tennessee have been documented in the project area based on point-count surveys or eBird (2020) occurrences. Two observed species, wood thrush (*Hylocichla mustelina*) and Swainson's warbler (*Limnothlypis swainsonii*) are listed as State Wildlife in Need of Management as stated in the Rules and Regulations for In Need of Management, Threatened, and Endangered Species (Chapter 1660-01-32.03) of the Rules of the Tennessee Wildlife Resources Agency (TWRA). In addition, the USFWS Division of Migratory Bird Management in the Appalachian Mountains region lists the following species, which have been documented in the project area, as Birds of Conservation Concern (BCC): wood thrush, Swainson's warbler, bald eagle (*Haliaeetus leucocephalus*), black-billed cuckoo (*Coccyzus erythropthalmus*), eastern whip-poor-will (*Antrostomus vociferus*), Louisiana waterthrush (*Parkesia motacilla*), red-headed woodpecker (*Melanerpes erythrocephalus*), worm-eating warbler (*Helmitheros vermivorum*), and yellow-bellied sapsucker (*Sphyrapicus varius*) (USFWS 2008a, 2020b). The preferred habitat and seasonality of these nine species are discussed below. Several other birds listed as either State Wildlife in Need of Management or BCC could occur in the project area but were not documented by point-count surveys or eBird (2020) occurrences (see appendix G).

Bald Eagle. The bald eagle was delisted from the federal ESA in 2007. It was listed as a BCC in 2008 (USFWS 2008a) but is not currently considered a BCC (USFWS 2020). The species has been documented within the project area (eBird 2020) and warrants attention because it is protected under the Bald and Golden Eagle Protection Eagle Act. Bald eagle breeding habitat includes areas close to lakes and rivers or other bodies of water that provide their primary food sources of fish and waterfowl. Nesting adults stay in Tennessee year-round, while other wintering bald eagles begin arriving in Tennessee to forage and roost on ice-free lakes and large rivers through mid-February. In the southeastern US, bald eagle courtship and nest building begins in the fall but can continue through winter; egg laying and incubation is from mid-October through March and peaks in late February; eggs hatch as early as mid-November, and rearing young occurs through April; fledging young occurs from early February through May, and young birds usually remain near the nest for several weeks (USFWS 2007a). The project area does not contain nesting habitat for bald eagles, but suitable foraging habitat is found in the regional vicinity, and bald eagles could periodically occur in Wears Valley. The nearest known bald eagle nest is approximately 7 miles southwest of the project area along the Little River in Townsend, Blount County.

Black-billed Cuckoo. The black-billed cuckoo, a USFWS BCC (2020b), has been documented in Wears Valley by eBird (2020) occurrences. Black-billed cuckoos inhabit deciduous forests and thickets, mainly at higher elevations during their breeding season in the Appalachian Mountains. They are a forest interior species, preferring large tracts of wooded areas. Their breeding season is from April to August.

Wood Thrush. The wood thrush, a USFWS BCC (2008, 2020b) and state species in need of management, has been documented in the project area by point-count surveys and eBird (2020) occurrences. In their breeding range, wood thrush prefer well-developed, mesic deciduous and mixed forests, often with a moderate sub-canopy and shrub density, fairly open forest floor, moist soil, and decaying leaf litter layer. Wood thrush are more likely to occur in extensive forests but may nest in 1-hectare fragments and semi-wooded residential areas and parks. Common tree species in occupied forests include American beech, sweet gum (*Liquidambar styraciflua*), red maple, black gum, eastern hemlock, flowering dogwood, American hornbeam (*Carpinus caroliniana*), oaks (*Quercus* spp.), and pines (*Pinus* spp.) (Evans et al. 2020). Wood thrush nest from early May to mid-August in the Park (NPS 2020d).

Swainson's Warbler. The Swainson's warbler, a USFWS BCC (2008) and state species in need of management, has been documented in the project area by point-count surveys. In their breeding range, Swainson's warblers occupy two habitat types in the Appalachian Mountains. One community type is dominated by rhododendron, mountain laurel, eastern hemlock, and American holly (*Ilex opaca*). The second community type includes mature mountain ravine hardwoods that contain species such as tulip tree (*Liriodendron tulipifera*), oaks, and maple (*Acer* spp.) associations with understories of spicebush (*Lindera benzoin*) and greenbrier (Anich et al. 2020). Swainson's warblers nest from early May to early August in the Park (NPS 2020d).

Eastern Whip-poor-will. The eastern whip-poor-will, a USFWS BCC (2008, 2020b), has been documented in the project area by point-count surveys and eBird (2020) occurrences. Eastern whip-poor-wills prefer dry deciduous or mixed forests with little or no underbrush throughout most of their range. The openness of the forest understory is a key characteristic of preferred habitat for this species. Eastern whip-poor-wills nest from late April to mid-August in the Park (NPS 2020d).

Louisiana Waterthrush. The Louisiana waterthrush, a USFWS BCC (2008), has been documented in the project area by point-count surveys and eBird (2020) occurrences. In their breeding range, Louisiana waterthrush occur along medium to high-gradient, clear, perennial streams that flow through closed-canopy, deciduous or mixed-evergreen forests on sloped terrain (Mattsson et al. 2020). Louisiana waterthrush nest from mid-April to mid-July in the Park (NPS 2020d).

Red-headed Woodpecker. The red-headed woodpecker, a USFWS BCC (2008, 2020b), has been documented in the project area by point-count surveys and eBird (2020) occurrences. Red-headed woodpeckers inhabit a variety of habitats containing trees, typically with an open understory and dead

limbs or snags for nesting cavities. Preferred breeding habitat includes deciduous woodlands, especially with beech or oak trees, river bottoms, open woods, groves of dead and dying trees, orchards, parks, golf courses, open agricultural fields, grasslands with scattered trees, forest edges, and roadsides (Frei et al. 2020). Red-headed woodpeckers nest from early May to late July in the Park (NPS 2020d).

Worm-eating Warbler. The worm-eating warbler, a USFWS BCC (2008), has been documented in the project area by point-count surveys. In their breeding range, worm-eating warblers inhabit large tracts of mature deciduous or mixed deciduous-coniferous forest that overlap with hillsides and smaller patches of shrubs, including mountain laurel and rhododendron. Worm-eating warblers are considered a forest interior species and are uncommon in small forest patches within fragmented forest landscapes (Vitz, Hanners, and Patton 2020). Worm-eating warblers nest from early mid-May to late July in the Park (NPS 2020d).

Yellow-bellied Sapsucker. The yellow-bellied sapsucker, a USFWS BCC (2008, 2020b), has been documented in the project area by point-count surveys and eBird (2020) occurrences. Yellow-bellied sapsuckers prefer late successional mixed-pine hardwoods as optimal habitat. They are common in lower elevation forests in Tennessee during the non-breeding season but are one of the rarest breeding birds in the state because they are restricted to high-elevation forests in the project vicinity. Breeding season records exist for Cove Mountain and Roundtop Trail (late May 1997), so this species could breed in the project area. The number of breeding pairs of the yellow-bellied sapsucker has declined in recent years and there have been few recent breeding season records (TWRA 2020).

Bats

Woodland, riparian, and grassland habitats in the project area provide roosting and foraging opportunities for several species of bats. The project area does not contain any known hibernacula (caves where bats winter in large colonies); however, hibernacula occur throughout the region, including elsewhere in the Park. Several species of bats in the eastern United States have experienced severe population declines as a result of white-nose syndrome (WNS), a fungal disease that is highly contagious among many bat species.

Acoustic surveys conducted in in August 2020 confirmed the presence of northern long-eared bat (*Myotis septentrionalis*), tricolored bat (*Perimyotis subflavus*), big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Aeorestes cinereus*), evening bat (*Nycticeius humeralis*), and silver-haired bat (*Lasionycteris noctivagans*) (NPS 2020d). Other bats that are known to occur or could occur in the project area include Indiana bat (*Myotis sodalis*), little brown bat (*Myotis lucifugus*), Rafinesque's big-eared bat (*Corynorhinus rafinesquii*), and eastern small-footed bat (*Myotis leibii*). Acoustic surveys detected probable absence for the gray bat (*Myotis grisescens*) in the project area.

Two bat species that have been documented or are likely to occur in the project area are listed as endangered or threatened under the ESA, and two other species are currently under review for listing. These species and their statuses are shown in table 10. Their habitat preferences and occurrence in the project area are discussed below.

TABLE 10. ESA-LISTED BATS IN THE PROJECT AREA

Common Name	Scientific Name	Status
Indiana bat	*Myotis sodalis*	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Threatened
Little brown bat	*Myotis lucifugus*	Under Review
Tricolored bat	*Perimyotis subflavus*	Under Review

Indiana Bat. During winter, large colonies of Indiana bats hibernate in caves or abandoned mines known as hibernacula. Although there are no hibernacula in the project area, the Park contains five known Indiana bat hibernacula, and another is located approximately 0.25 miles outside the Park. The project area is located within the designated swarming area for White Oak Blowhole, a Priority 1 cave and designated critical habitat for Indiana bat. Priority 1 hibernacula are those that have a current and/or historically observed winter population of 10,000 or more Indiana bats (USFWS 2007b). This site is part of the Great Smoky Mountains Conservation Focus Area for Indiana bat and northern long-eared bat (USFWS 2017). Indiana bats have not been documented in the abandoned mine complexes within the Park.

The project area and most of the Park below 4,500 feet elevation is considered suitable summer habitat for Indiana bats. Acoustic surveys conducted in and near the project area in August 2020 did not detect the presence of Indiana bats. However, the Park's geographic information system (GIS) database has records for two Indiana bat roost trees identified in 2012 about 0.6 miles outside the project area, and an Indiana bat was captured in a mist nest about 1 mile outside the action area in 2012. Based on these records, forests in the project area are considered non-maternity habitat for the Indiana bat. Non-maternity habitat refers to suitable summer habitat used by non-reproductive adult females and/or males. For Indiana bats, the known habitat buffer around a non-maternity record (i.e., mist net or roost tree) is 2.5 miles (USFWS 2017).

Northern Long-eared Bat. Northern long-eared bat has similar habitat requirements as Indiana bat. Like Indiana bats, northern long-eared bats hibernate in caves or mines during winter and migrate to roosting habitats during spring. Although there are no hibernacula in the project area, the Park contains six known northern long-eared bat hibernacula, and another is located approximately 0.25 miles outside the Park. Northern long-eared bats have not been documented in the abandoned mine complexes within the Park.

Summer roosting and foraging habitat for northern long-eared bat is the same as that of Indiana bat, described above (USFWS 2015). Twenty-five northern long-eared bats have been documented within 5 miles of the project area since 1999. The project area is located within the summer maternity buffer for northern long-eared bat. The project area is also located within the WNS zone; the zone includes all counties that contain or are located within 150 miles of documented cases of WNS or documented presence of the fungus that causes WNS (USFWS 2020b). WNS has had serious impacts on the northern long-eared bat population.

Little Brown Bat. The habitat requirements of little brown bat are similar to those of Indiana bat and northern long-eared bat, as described above. Although the project area does not contain any hibernacula, the Park contains seven known little brown bat hibernacula, and another is located approximately 0.25 miles outside the Park. Little brown bats have also been documented at one abandoned mine complex in the Park. Additionally, 45 little brown bats have been documented within 5 miles of the project area since 1999, although only two have been recorded since 2010.

Tricolored Bat. The life history characteristics and habitat requirements of little brown bat and tricolored bat are similar to those of the bat species described above. The primary characteristic that distinguishes tricolored bat from other bat species is that it frequently roosts in live trees during summer months, rather than snags (TWRA 2015).

Although the project area does not contain any hibernacula, the Park contains seven known tricolored bat hibernacula and two more are located approximately 0.25 miles outside the Park. Tricolored bats have not been documented in the abandoned mine complexes within the Park. Additionally, four live tricolored bats have been documented within 5 miles of the project area since 1999 according to the Park's GIS database. Three dead bats were also documented during this time.

Bears

Black bears (*Ursus americanus*) are common throughout the Park and occur at all elevations; they are not a threatened or endangered species. Though populations vary, the Park's bear population is estimated to be around 1,900 individuals (NPS pers. comm. 2020e). Black bears are most active during early morning and late evening hours in spring and summer and typically den during the winter. Cubs are usually born in January or February (NPS 2017). The combination of high human use and a large number of bears creates a situation where human-bear conflicts can occur. Human-bear conflicts occur each year at the Park and documented conflicts have occurred adjacent to the project area at the Metcalf Bottoms picnic area. The objective for managing bears in the Park is to manage visitors, concessioners, and employees in a manner that allows bears to live naturally and provide for safe visitor use (NPS 2002).

ENVIRONMENTAL CONSEQUENCES

Alternative 1—No Action

Under the no action alternative, there would be no change to the use of the project area. The open fields would continue to be used for hay production (approximately 66 acres) under a special use permit. Haying would continue to provide the same amount of open field that currently helps support the diversity of habitat types in the project area. Because the habitats types would continue to be available in the current acres, there would be no impacts on birds, bats, or bears.

Alternative 2

Birds. Potential stressors associated with alternative 2 that may affect birds include construction, habitat alteration, and visitor use (operation).

Construction—Construction of alternative 2 would require 21.4 acres of habitat disturbance. Because birds are highly mobile, they could avoid the area during construction, so direct impacts that could cause bird injury or mortality are unlikely. As noted in the mitigation measures, because tree removal would only occur outside the nesting season, from November 15 through March 31, construction would be unlikely to disturb or destroy bird nests, a direct impact that would mostly be limited to open fields (7.9 acres). Indirect impacts to birds during construction could include birds avoiding the project area to reduce their exposure to risks associated with project personnel, chainsaws, and heavy machinery. Adverse impacts on birds and bird habitat from project construction would be temporary, lasting only during construction. Approximately 5 acres of temporary habitat disturbance from earthmoving activities would be revegetated and rehabilitated following construction activities.

Noise from construction activities would temporarily affect all bird species in the project area. Impacts from habitat alteration are discussed below. Construction activities at the site would mostly impact common bird species, including the American crow (*Corvus brachyrhynchos*), American goldfinch (*Spinus tristis*), American robin (*Turdus migratorius*), Carolina chickadee, Carolina wren (*Thryothorus ludovicianus*), blue jay (*Cyanocitta cristata*), eastern bluebird (*Sialia sialis*), ruby-throated hummingbird (*Archilochus colubris*), northern cardinal (*Cardinalis cardinalis*), northern mockingbird (*Mimus polyglottos*), and mourning dove (*Zenaida macroura*). These species are generally adaptable to human development and are anticipated to relocate within or near the project area.

Under alternative 2, construction would also occur adjacent to a large wetland and riparian area, and noise would likely disturb birds in those location. Bird species likely to nest in water/wetland habitats include, but are not limited to, Acadian flycatcher (*Empidonax virescens*), northern parula (*Setophaga Americana*), Swainson's warbler, swamp sparrow (*Melospiza georgiana*), and Louisiana waterthrush. Because of the limited extent of these habitats in the project area, birds within water/wetland habitats would experience limited impacts, including the Swainson's warbler, a USFWS BCC (2008) and state species in need of management. Similarly, bald eagles have only occasionally been observed in Wears

Valley and because there is limited foraging and roosting habitat, construction would be unlikely to affect them. Over the short term, the overall abundance of bird species in water/wetland habitats could decrease slightly during construction, but no long-term, population-level impacts are expected.

Habitat Alteration—Alternative 2 would alter vegetation and modify soil surfaces, which could reduce nesting and foraging habitat for birds. Long-term impacts on birds and bird habitat would occur from the permanent loss of 11.2 acres of forest habitat. Temporary impacts from earthmoving activities would affect an additional 2.1 acres that would be converted to early successional habitat and regrow into treed areas. Bird species potentially directly impacted by forest habitat loss include, but are not limited to, abundant species such as the black-throated green warbler (*Setophaga virens*), blue-headed vireo (*Vireo solitarius*), and ovenbird (*Seiurus aurocapilla*). Common forest species that could be affected include blue-gray gnatcatcher, (*Polioptila caerulea)*, eastern phoebe (*Sayornis phoebe*), eastern wood pewee (*Contopus virens*), golden-crowned kinglet (*Regulus satrapa*), hooded warbler (*Setophaga citrina*), magnolia warbler (*Setophaga magnolia*), rose-breasted grosbeak (*Pheucticus ludovicianus*), and scarlet tanager (*Piranga olivacea*). Special status forest-dependent birds like the red-headed woodpecker and yellow-bellied sapsucker could be affected if snags were removed during project construction; however, this is unlikely, and both species prefer open woodlands and forest edges that would be created by the project. Individual birds of species that require specific habitats or relatively large areas of undisturbed habitat could potentially decline from areas that would be fragmented by the access road, trailheads, and trails; however, overall impacts on forest birds would be relatively minor, and populations are not expected to decline because of the availability of suitable habitat nearby. While around 13.3 acres of forested habitat would be disturbed, the project would directly affect about 5% of the available forested habitat in the project area, and nearly 300 acres of forested habitat would remain. Forest habitat alteration is not expected to result in population-level impacts or changes in the types of bird species using the project area.

Additionally, 7.9 acres of open field would be disturbed, of which 2.5 acres would be temporarily disturbed and revegetated to open field habitat following construction. Open field habitat loss would affect common bird species such as field sparrow (*Spizella pusilla)*, eastern towhee (*Pipilo erythrophthalmus)*, and indigo bunting (*Passerina cyanea)*, as well as uncommon species such as the eastern meadowlark (*Sturnella magna*) and American pipit (*Anthus rubescens*).

Project roads, trails, parking lots, and trailheads would fragment habitat and create edges that may cause changes in the bird community by dissecting habitats into smaller patches. Increased sunlight, temperature extremes, wind exposure, and reduced humidity could alter forest habitats, which would influence vegetation structure and food availability for birds. Such changes may create edge habitats that are unsuitable for some "forest interior" bird species. Furthermore, predation risk and brood parasitism for birds nesting near edges could increase. Birds vulnerable to forest fragmentation, like the worm-eating warbler, hooded warbler, wood thrush, and black-billed cuckoo would be most susceptible such impacts. However, the majority (9.6 acres) of the disturbed forest habitat would be for 4- to 10-foot-wide trails, a narrow width at which fragmentation and edge effects are not expected to have population-level effects on birds. Habitat alteration is not expected to negatively affect the wood thrush, a USFWS BCC (2008, 2020b) and state species in need of management.

Visitor Use—More than 400 acres in the project area would remain in its current condition and would continue to provide habitat for birds. However, mountain biking and other visitor uses in the project area could have long-term impacts on individual birds by temporarily disturbing and displacing individuals from their territories. The presence of trails and use by mountain bikers could alter species composition, disrupt nesting, or disturb foraging birds directly adjacent to the trails. Species that nest or forage on the ground have been reported to have the greatest response to the presence of recreationists, when compared to birds foraging or nesting higher in the canopy (Thompson 2015). For example, the eastern whip-poor-will, a USFWS BCC, often abandon and move to new sites after repeated disturbance (Cink et al. 2020). Additionally, the existence and recreational use of mountain bike trails and the access road could affect

grassland birds in the form of reduced density, territoriality, nesting, and nest success (Miller, Knight, and Miller 1998; Sutter, Davis, and Duncan 2000; Yoo and Koper 2017). Miller et al. (1998) found that generalist species such as American robins were more common along trails, but nests for other species were less likely to occur along trails and were more susceptible to predation in areas proximal to trails. For species sensitive to trails, the zone of influence was reportedly about 250 feet and up to 330 feet for the most sensitive species. The level of visitor use anticipated within the project area could affect some individual birds but is unlikely to negatively affect their populations, including species of concern like the eastern whip-poor-will. Additionally, certain bird species are positively associated with forest edges and prefer to nest along roads and trails; these species would benefit under alternative 2. Birds commonly found in edge habitats include wild turkey, Carolina wren, great crested flycatcher (*Myiarchus crinitus)*, chestnut-sided warbler (*Setophaga pensylvanica)*, white-eyed vireo (*Vireo griseus)*, blue-gray gnatcatcher, brown thrasher (*Toxostoma rufum)*, blue-winged warbler (*Vermivora pinus)*, prairie warbler (*Setophaga discolor)*, common yellowthroat (*Geothlypis trichas)*, yellow-breasted chat (*Icteria virens)*, indigo bunting, eastern towhee, field sparrow, song sparrow (*Melospiza melodia)*, and orchard oriole (*Icterus spurius)*.

Overall, alternative 2 would permanently convert 17.1 acres of natural wildlife habitat to impervious surface or trail, which would result in long-term changes in bird habitat. Over the short term, a local decrease in bird abundance is expected as a result of displacement during construction and ground disturbance over 22.3 acres. Although bird habitat in the project area would be degraded to some degree over the long term based on a departure from natural conditions, the affected habitat represents approximately 5% of the overall project area. As a result, alternative 2 is not expected to result in bird population-level impacts or changes in the composition of bird species using the project area because the affected habitats represent a small portion of the project area and are common throughout much the Park.

Bats. Under alternative 2, 13.3 acres of tree removal would be required for construction. While large-diameter trees would be avoided to the extent possible, construction would likely include the removal of some trees greater than 5 inches diameter at breast height that provide summer roosting habitat for bats, including the federally listed Indiana and northern long-eared bat. To minimize impacts on roosting bats, and in accordance with the 4(d) rule for northern long-eared bats, tree clearing would be conducted from November 15 to March 31 when bats are hibernating, making injury or mortality to bats during tree removal highly unlikely. Removal of suitable roosting trees would be avoided wherever possible (e.g., slight rerouting of the mountain bike trail during construction) further limiting impacts on roosting habitat; however, permanent removal of up to 11.2 acres of forested habitat would represent a permanent loss of suitable summer habitat for bats, permanent loss of fall swarming habitat and non-maternity habitat for the Indiana bat, and permanent loss of maternity habitat for the northern long-eared bat. This would amount to 3.6% of the total forested habitat in the project area and less than 0.01% of forested habitat in the Park. Alternative 2 would also affect approximately 7.9 acres of grassland/pasture habitat of which 5.4 acres would be permanent. This would represent 6.1% of the total grassland/pasture habitat in the project area. Given the small amount of habitat that would be lost relative to the amount of available foraging habitat in the project area and the Park, no population-level effects or changes to species composition in the project area are expected.

Additionally, any construction activities that occur during the summer could adversely affect roosting bats because of noise and human disturbance in the project area. Significant changes in noise levels or visual disturbance in an area can result in temporary or permanent alteration of bat behaviors; however, these activities would occur during the daytime, when bats are normally roosting.

While construction impacts would be temporary, disturbances to roosting bats associated with maintenance activities and noise associated with increased visitor use (e.g., vehicle traffic, mountain bikers) would continue to affect bats over the long term. The trail system is expected to experience most use during the daytime, when bats are normally roosting, which may limit disturbances to bats. However, the trails would remain open 24 hours, so some visitor use could occur at night when bats are active.

There would also be noise and visual disturbances associated with the access road and parking areas. Studies have shown that bats tend to avoid areas with high levels of noise and visual disturbance, such as transportation corridors, but other studies have found that bats may tolerate substantial levels of noise and visual disturbance and did not document noticeable shifts in behavioral patterns or roosting site selection (USFWS 2008b). Studies have also found that bats appear to become habituated to ongoing noise and visual disturbances, suggesting that impacts decrease over time following construction of a new project (USFWS 2002). Overall, noise or visual disturbance from visitor use of the trail system is initially anticipated to result in behavioral responses to these stressors, but bats would likely become habituated to visitor use of the trail system over the long term.

Available Parkwide data suggest that Indiana and northern long-eared bats typically do not roost within 100 feet of roads. If noise and visual disturbances cause bats to avoid the access road and parking areas by 100 feet, the amount of suitable forested habitat for roosting bats would be reduced by 11.7 acres. However, no population-level effects or changes to species composition in the project area are expected. A biological evaluation was prepared in accordance with section 7 of the ESA. Consultation with USFWS is ongoing and will be documented in the decision document for this EA.

Overall, alternative 2 would result in direct and indirect, short- and long-term, adverse impacts bats, including the federally listed Indiana and northern long-eared bat, from the permanent removal of up to 11.2 acres of forested habitat in the project area, noise associated with construction and maintenance activities, and increased visitor use that could affect suitable habitat on an additional 11.7 acres. While there would be a slight reduction in available habitat, it is not anticipated that the reduction would affect bat populations or species composition in the project area. Similarly, impacts from noise and increased human presence in the project area are not anticipated to affect bats at the population level or alter species composition.

Bears. Alternative 2 would result in adverse impacts to bears from increased visitor use and human presence in the project area and loss of forested habitat and travel corridors. Removing 13.3 acres of forested habitat would reduce the amount of habitat available for bears. The majority (9.6 acres) of forest removal would be for trails, which would not noticeably alter forested habitat for bears; however, establishing trails could disrupt established travel corridors. The slight reduction of forested habitat under alternative 2 is not expected to affect the bear population in the project area, and bears would likely establish alternate travel corridors if disruptions occur. Construction activities are not expected to affect bears because they would likely avoid these areas during construction. Additionally, construction and maintenance activities would occur during the day when bears are typically less active. Placing bear-proof dumpsters at construction sites would further minimize the likelihood of impacts to bears during construction.

Food and garbage left behind on trails and in picnic areas attracts bears and can adversely affect health and survival or lead to human-bear conflicts. When bears become accustomed to scavenging leftover human food and garbage, their behavior changes and they lose their instinctive fear of humans. Over time, these bears may begin approaching people in search of food and may become more unpredictable and dangerous. They may also teach this behavior to other bears. Because this poses a safety risk to Park visitors, it is often necessary to capture and relocate or euthanize these bears (NPS 2017). From 2009 to 2019, between 1 and 10 bears were euthanized each year in the Park (Stiver and Williamson 2020). Additionally, while black bears can live 12–15 years or more, bears that have had access to human foods and garbage have a life expectancy of half that time (NPS 2017). The development of a new visitor use area in the Park could increase the potential for bears to adapt to the presence of humans and adopt these behaviors. Under alternative 2, picnic areas would be established at each of the two trailheads.

The Park currently implements management practices to minimize the risk of human-bear conflicts, including placing bear-proof dumpsters in campgrounds and picnic areas, implementing food storage regulations for Park visitors, and closing of some picnic areas early during summer months so these areas

can be thoroughly cleaned before dark, and any food scraps or trash left by careless visitors can be removed (NPS 2017). These measures would be implemented in the project area under alternative 2 and would limit the risk of human-bear conflicts. Other measures that would be implemented to avoid human-bear conflicts are listed under "Mitigation Measures" in chapter 2. These measures would limit the potential for bears to be exposed to food and garbage by limiting areas where visitors would have food, implementing good housekeeping practices, and educating visitors on "leave-no-trace" practices.

Vehicle strikes are also a major source of bear mortality at the Park. From 2009 to 2019, vehicle strikes killed between 6 and 18 bears each year (Stiver and Williamson 2020). Although alternative 2 would facilitate additional vehicle traffic in the project area, it is not expected to result in a noticeable increase in bear mortalities from vehicle strikes because the access road would lead to trailheads that are not a throughway and would be located outside forested habitat and near existing developed areas. Vehicle traffic on the access road and trailheads would also be limited to low speeds, making it likely that vehicles would have sufficient time to avoid collisions with bears should they be present in the road.

Overall, alternative 2 would result in direct and indirect, long-term, adverse impacts on bears from the potential for bears to continue to adapt to the presence of humans because of increased human presence in the project area and loss of habitat and travel corridors. Ongoing management would continue to minimize the risk of human-bear conflicts. Population-level impacts are not anticipated.

Cumulative Impacts. Past development of Parkway Section 8E and continued increased residential development in Wears Valley have resulted in habitat loss and fragmentation outside the project area, which had adversely affected wildlife, including threatened and endangered species. Future actions, including the development of Parkway Section 8D could result in additional habitat loss or fragmentation and disturbances to wildlife.

Alternative 2 would contribute adverse impacts on wildlife in the project area from increased visitation to the area and some loss or modification of habitat, including tree removal. When the incremental impacts from alternative 2 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on wildlife would be adverse, with the incremental impacts of alternative 2 contributing slight impacts.

Alternative 3—NPS Preferred Alternative

Birds. Under alternative 3, the types of temporary direct and indirect impacts on birds would be similar to those described for alternative 2, but impacts would be greater because of the larger project footprint. Specifically, the access road would be approximately 0.28-miles longer and fragment an additional 12-acre patch of grassland that would be remain intact under alternative 2. Although a north trailhead would not be constructed, which would reduce impacts to grassland/pasture birds, the access road would still fragment grassland/pasture. The larger footprint of the trailhead under alternative 3 would be within forest habitat and would contribute to greater impacts on forest birds. Overall, alternative 3 would require the removal of 14.3 acres of forested habitat in the project area, which is 1.0 acre more than under alternative 2. Impacts on birds that prefer forest habitat would be the same as those described for alternative 2, but to a slightly greater extent.

Overall, alternative 3 would permanently convert 11.9 acres of natural wildlife habitat to impervious surface or trail, which would result in long-term changes in bird habitat. Over the short term, a local decrease in bird abundance is expected as a result of disturbance or displacement during construction across approximately 25.4 acres. Although bird habitat in the project area would be altered to some degree over the long term based on a departure from natural conditions, the impacted habitat represents approximately 4% of the overall project area. As a result, alternative 3 is not expected to result in bird population-level impacts or changes in the composition of bird species using the project area because the affected habitats represent a small portion of the project area and are common throughout much the Park.

Impacts on birds would be reduced through mitigation measures (see chapter 2) to avoid disturbance of nesting birds during project construction.

Bats. Impacts on bats and bat habitat under alternative 3 would be similar to those described for alternative 2, but impacts on roosting and foraging habitat would be slightly increased because of the location of the trailhead, length of the access road, and construction of a pedestrian trail in addition to mountain bike trails. Alternative 3 would result in the removal of approximately 14.3 acres of forested habitat of which 11.9 acres would be permanent. Alternative 3 would also result in the loss of approximately 9.9 acres of grassland/pasture habitat of which 5.2 acres would be permanent. The permanent loss of these habitats would represent less than 4% of forested habitat and less than 6% of open field habitat in the project area, respectively. Impacts on bats would be the same type of impact as described under alternative 2, but to a slightly greater extent with 0.7 additional acres of permanent tree removal. Winter tree clearing would limit impacts on bats as described under alternative 2.

Overall, alternative 3 would result in direct and indirect, short- and long-term, adverse impacts on bats, including the federally listed Indiana and northern long-eared bat, from the permanent removal of up to 11.9 acres of forested habitat in the project area, noise associated with construction and maintenance activities, and increased visitor use. While there would be a slight reduction in available habitat, it is not anticipated that the reduction would affect bat populations or species composition in the project area. Similarly, impacts from noise and increased human presence in the project area is not anticipated to affect bats at the population level or alter species composition.

Bears. The types of impacts on bears under alternative 3 would be the same as those described under alternative 2. Permanent loss of forested habitat would increase slightly under alternative 3 (11.9 acres, representing approximately 4% of the forested habitat in the project area) but is not expected to affect the bear population in the project area because of the large amount of nearby forested habitat that would remain available to bears. Alternative 3 would have slightly higher potential to disrupt bear travel corridors because more total miles of trail would be established. The potential for additional human-bear conflicts would be slightly reduced under alternative 3 because only one picnic area would be established. Ongoing management would continue to minimize the risk of human-bear conflicts. Population-level impacts are not anticipated.

Cumulative Impacts. Impacts on wildlife from cumulative actions would be the same as those described for alternative 2. Alternative 3 would contribute adverse impacts on wildlife from increased visitation to the area and some loss or modification of habitat, including limited tree removal. When the incremental impacts from alternative 3 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on wildlife would be adverse, with the incremental impacts of alternative 3 contributing slight impacts.

Alternative 4

Birds. Under alternative 4, the types of temporary direct and indirect impacts on birds would be the same as those described under alternative 2 but would occur to a lesser extent because of the smaller project footprint. Overall, the total disturbance under alternative 4 would be 11.8 acres. Impacts on forest birds would be less than alternative 2 because approximately 6.4 acres of forest habitat removal would be required. Likewise, impacts on grassland birds would be reduced relative to the other action alternatives because the access road and trailhead would only affect one grassland patch of approximately 2 acres, although the construction of trails would disturb 2.1 additional acres of grassland habitat. Impacts on birds would be the same as described under alternative 2, but to a lesser extent.

Overall, alternative 4 would permanently change approximately 10 acres of natural wildlife habitat to impervious surface or trail, which would result in long-term changes in bird habitat. Over the short term, a local decrease in bird abundance is expected from disturbance or displacement during construction. Although bird habitat in the project area would be degraded to some degree over the long term based on a

departure from natural conditions, the affected habitat represents approximately 3% of the overall project area. As a result, alternative 4 is not expected to result in bird population-level impacts or changes in the composition of bird species using the project area because the affected habitats represent a small portion of the project area and are common throughout much the Park. Impacts on birds would be reduced through mitigation measures (see chapter 2) to avoid disturbance of nesting birds during project construction.

Bats. Impacts on bats and bat habitats would be similar to those described for alternative 2; however, impacts on roosting and foraging habitat would be reduced because of the location of the trailhead, shorter length of the access road, and trail configurations. Alternative 4 would remove approximately 6.4 acres of forested habitat and would affect approximately 3.8 acres of grassland/pasture habitat. Impacts on bats would be the same type of impact described under alternative 2, but to a lesser extent with approximately half of the acres of tree removal. Winter tree clearing would limit impacts on bats as described under alternative 2. Impacts from the use of the mountain bike trail system would also be reduced because the forested habitat south of Katy Hollar Road would not be used as part of the trail system. The level of human presence in this location would remain the same as under existing conditions, which would further reduce impacts on bats compared to alternative 2.

Overall, alternative 4 would result in direct and indirect, short- and long-term, adverse impacts on bats, including the federally listed Indiana and northern long-eared bat, from the removal of up to 6.4 acres of forested habitat in the project area and noise associated with construction and maintenance activities. The removal of 6.4 acres of forested habitat represents less than 3% of the available forested habitat in the project area. While there would be a slight reduction in available habitat, it is not anticipated that the reduction would affect bat populations or species composition in the project area. Similarly, noise during construction and maintenance activities is not anticipated to affect bats at the population level or alter species composition.

Bears. The types of impacts on bears under alternative 4 would be the same as those described for alternative 2. Alternative 4 would be less likely to disrupt bear travel corridors because fewer total miles of trail would be established. Additionally, the potential for human-bear conflicts would be reduced slightly because there would be no trail infrastructure south of Katy Hollar Road. Like alternative 3, only one picnic area would be established under alternative 4. Ongoing management would continue to minimize the risk of human-bear conflicts. Population-level impacts are not anticipated.

Cumulative Impacts. Impacts on wildlife from cumulative actions would be the same as those described for alternative 2. Alternative 4 would contribute adverse impacts on wildlife from increased visitation to the area and some loss or modification of habitat, including limited tree removal. When the incremental impacts from alternative 4 are combined with the impacts from past, present, and reasonably foreseeable actions, the overall cumulative impact on wildlife would continue to be adverse, with the incremental impacts of alternative 4 contributing slight impacts.

KARST RESOURCES

AFFECTED ENVIRONMENT

Karst topography is a type of landscape where dissolving bedrock creates features such as sinkholes, sinking streams, caves, or springs. Karst is associated with soluble rock types such as limestone, marble, and gypsum. In general, a typical karst landscape forms when much of the water falling on the surface interacts with and enters the subsurface through cracks, fractures, and holes that have been dissolved into the bedrock (NPS 2018). Surface water interacts with soluble rock types to create breaks or openings in exposed surface rock that allow surface water to enter the ground and further erode soluble rock. This groundwater continues to travel below ground and eventually enters aquifers and/or discharges at springs, water supply wells, or streams.

In an undeveloped state, karst terrain produces about two-thirds less stormwater runoff than in non-karst regions (TDEC & UT 2014). As land is developed, paved surfaces, compacted soils, and alteration of grade and slope produce a greater rate and volume of runoff. Potential issues associated with development and increased runoff in karst landscapes include the following (TDEC & UT 2014):

- Runoff could be conveyed into a poorly defined surface drainage system that lacks the capacity to handle it.
- Runoff could increase the risk of new sinkhole formation (e.g., collapse or subsidence), particularly if runoff is allowed to pond in the landscape. The increased risk for sinkholes may apply to the development site or down-gradient areas receiving additional stormwater.
- Runoff could alter the existing groundwater recharge within the karst system. These changes could alter the hydrology of surface streams and diminish spring flows.
- Contaminants in polluted runoff, subsurface wastewater discharges, and spills could pass rapidly from the surface into groundwater in karst terrain. The strong interaction between surface runoff and groundwater could pose risks to drinking water quality and to water quality in springs and other surface waters.

Some karst features are underground (e.g., caves, subterranean streams, and karst aquifers), while others are commonly visible at the surface (e.g., sinkholes, springs, and sinking streams); however, in mantled karst settings, such surficial features may be covered or buried. Mantled karst is karst that is wholly or partly covered by a layer of soil above the bedrock, and these soils can cover air- or water-filled voids in the bedrock (Denton 2013). As a result of the soil cover, mantled karst may not be readily apparent at the surface. Examples of mantled karst features could include incipient sinkholes, underground caverns, large-diameter fissures, fractured rock, pinnacled rock, and voids. The karst terrain in Tennessee is distinct from some other regions (e.g., Florida) in that the bedrock is ancient; in some areas it is deeply buried by residual soils, while in others, it is at or near the surface (TDEC & UT 2014).

The project area is underlain by Jonesboro limestone, and known karst features exist in the general Wears Valley area. As a result, NPS conducted a desktop analysis and field investigations in 2021 to identify any surface karst features, potential karst features (referred to as karst-like features), and other features of interest in the project area (NPS 2022). These features are important to evaluate because they represent areas where surface water may enter the groundwater system in the project area. While water can potentially enter the bedrock in any location because of the permeability of the overlying soils and soluble nature of the Jonesboro limestone, these areas represent discrete locations where a greater volume of surface water may enter the groundwater system or where surface water infiltrating at a much greater rate may affect the groundwater system. These features are defined as follows for this Revised EA:

- Karst features include sinkholes, cave entrances, sinking streams, and springs that were confirmed through field investigation with definitive visual evidence such as an open sinkhole throat or an open cave entrance.
- Karst-like features include landscape elements where karst features likely exist beneath the surface (e.g., potential locations of mantled karst) but lack definitive visual evidence of an opening to the subsurface. As described below, karst-like features in the project area include closed depressions, a sinking stream, a pond, and a spring.
- Other features of interest are unlikely to be karst features but are important in understanding and considering existing stormwater runoff and groundwater patterns in the project area. As described below, other features of interest in the project area include ponds and an unidentified feature of interest.

The desktop analysis examined topography, soils, geology, surface drainage, and water resources to identify potential karst. Soils within the project area that are prone to sinkhole formation or soils that are

typically associated with alluvial fans that may be covering karst features include the Braddock, Steadman, and Talbott series, as displayed in figure 12 (in the "Soils" section, above). The Braddock soils series is present across 41% of the project area, while the Steadman and Talbot Rock Outcrop series includes 6% and less than 1% of the project area, respectively. Topography was analyzed using Digital Elevation Models to identify areas showing closed contours, depressions, disappearing drainage patterns, or shallow rock peaks that could represent typical topographic characteristics of karst features; these areas were deemed karst-like features. All karst-like features identified in this desktop analysis were further analyzed during field investigations.

Karst Features

The desktop review and field investigation did not identify any features open at the surface such as sinkhole throats or caves in the project area, which would be classified as karst features. However, some karst-like features and other features of interest were identified within the project area. Because these karst-like features are below the surface, they cannot be confirmed as karst features without geotechnical or geophysical analysis. For purposes of this EA, however, they are assumed to be karst features. These karst-like features and other features of interest are displayed in figure 15 and discussed below.

Karst-like Features

Two features were field-verified as being karst-like because they are closed depressions and are likely associated with mantled karst. The closed depressions—Laurel Ridge 1 and Laurel Ridge 2 (features 8 and 9, figure 15)—receive drainage from nearby ridgetops; this drainage is concentrated into a valley stream channel that connects the two closed depressions. Surface water flows through this channel when the drainage capacity of the closed depressions (i.e., when the infiltration capacity of the underlying soils) is exceeded. At times of high flow, surface water may fill and overflow these features as water is infiltrating the groundwater system. No open sinkhole throat or entry to the subsurface was found during field investigation for either of these two features.

Two additional features within the project area were also identified as karst-like during field investigations—Katy Hollar Pond 2 and a sinking stream along an unnamed tributary of Cove Creek. Field investigations noted that Katy Hollar Pond 2 (feature 11, figure 15) may be human-made or human-influenced but exhibits a sunken shape with concentric ledges that may be caused from sinkhole-type subsidence. This feature is currently saturated and acting as a point of groundwater infiltration. By capturing and holding water, this pond feature acts as a natural stormwater retention pond and point of concentrated groundwater infiltration. The sinking stream at the unnamed tributary of Cove Creek (feature 10, figure 15) is another feature that may be an expression of karst. This stream likely intersects a fracture or other opening in the bedrock that is covered by coarse cobbles and pebbles of the streambed, but the field investigation did not find definitive visual evidence of an opening to the subsurface so it was classified as karst-like.

NPS noted a previously recorded spring in the northwest corner of the project area (feature 2, figure 15). A detailed inspection of this area was not possible during the field investigation because of high water caused by a beaver dam. It is possible that additional springs occur in this area that could not be detected during the field investigation. Therefore, this feature is assumed to be karst-like.

Other Features of Interest - Ponds

Field investigations also noted several farm ponds/stormwater ponds in the project area that appear to be human-made or at least human-influenced (features 3 through 7, figure 15). These ponds appear to have well-saturated soils and are potential points of groundwater recharge. They were found to capture and retain water but were not assumed to be evidence of karst formation because they appeared to be formed from human activity rather than a result of dissolution.

Other Features of Interest - Undetermined Feature

One undetermined feature (feature 1, figure 15) was also identified through desktop analysis and investigated in the field. This feature may represent a spring or hand-dug well, but additional testing would be needed to determine if this is a surficial expression of karst or a human-made feature. While a hand-dug well is not a natural feature, it would still be an opening into the subsurface, may have a direct connection to the aquifer, and is considered in the analysis.

Mantled Karst

Because of the pervasive presence of soluble rock and soils associated with karst features, mantled karst may be present in the project area under residual and alluvial/colluvial soils. The Braddock series soils exhibit a grain-size grading and semi-cohesive texture that would allow them to naturally infill and cover these types of features.

Karst Features Adjacent to the Project Area

In addition to karst-like features in the project area, Stupkas Cave and several sinkholes are present about 0.5 miles northeast of the project area in the Section 8D corridor (not shown in figure 15). The project area is within the Cove Creek watershed with all surface water flowing downslope to the north into Cove Creek. The desktop analysis and field investigation conclude that surface water within the project area is unlikely to be hydrologically connected to Stupkas Cave. As a result, the action alternatives are not expected to affect the cave, groundwater in the cave, or cave biota, and cave resources are not discussed further in the analysis.

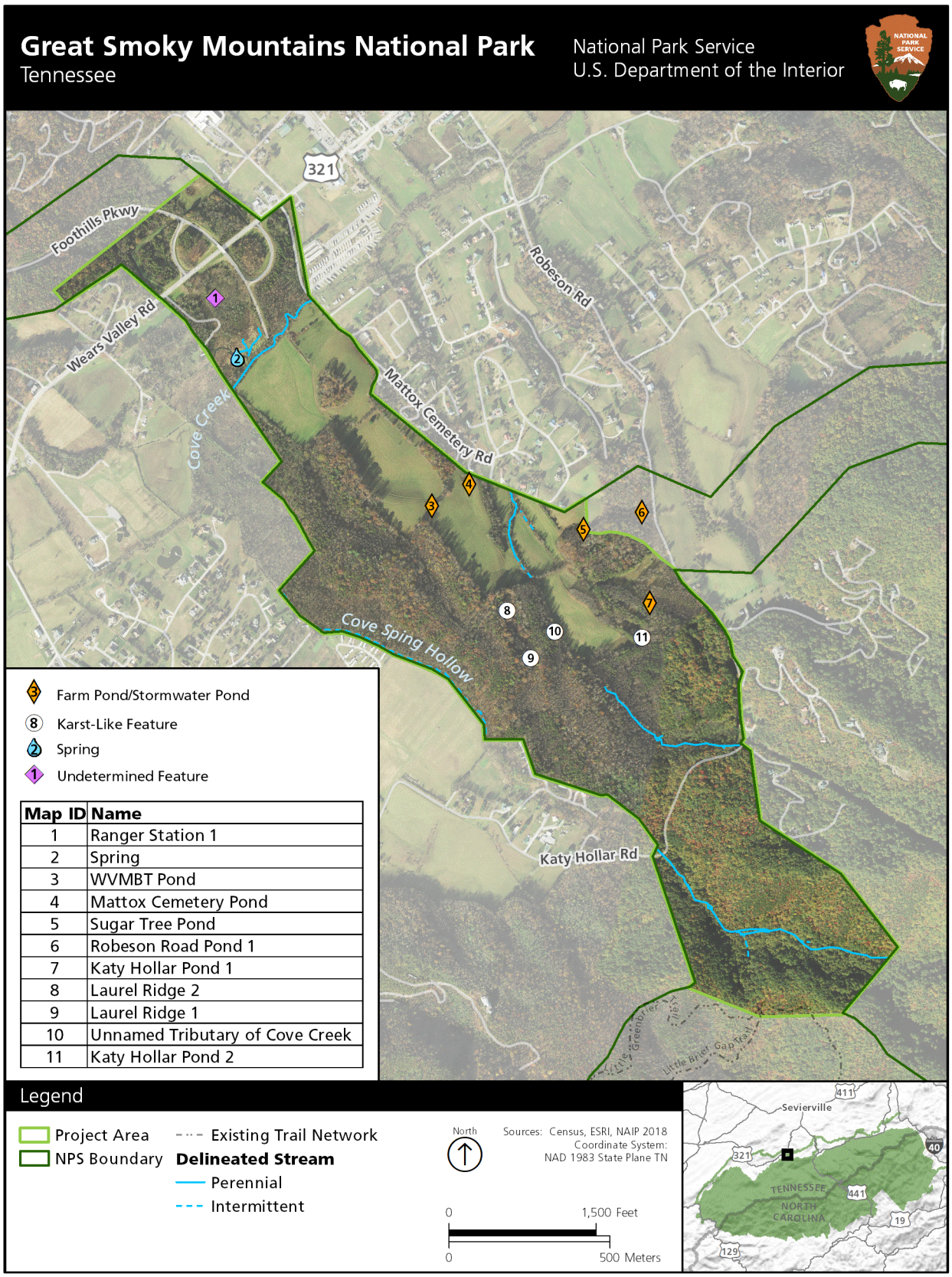


FIGURE 15. KARST-LIKE FEATURES AND FEATURES OF INTEREST

ENVIRONMENTAL CONSEQUENCES

Alternative 1—No Action

Under the no action alternative, there would be no change to the use of the project area. The existing hydrogeological processes that form karst features would not be altered.

Alternative 2

Under alternative 2, the existing landscape would be altered through the construction of unpaved trails, a road, bridge, parking areas, and two developed trailhead areas with septic systems. The total area of disturbance would be approximately 22.1 acres. Alternative 2 would result in the addition of approximately 5.6 acres of impervious surface in the project area, which represents about 1% of the total project area. Potential karst-related issues considered in the analysis include:

- Direct disturbance to karst-like features and other features of interest shown in figure 15, as well as subsurface features associated with mantled karst.
- Increases in the rate and volume of stormwater runoff, which could increase the potential for sinkhole formation.
- Introduction of contaminants in polluted runoff from impervious surfaces (roads, parking, and buildings), soil erosion, subsurface wastewater discharges, and spills, which could pass rapidly from the surface into groundwater in karst terrain with little or no filtration or modification.

Under alternative 2, one of the proposed trailheads would be located adjacent to and upgradient of an existing farm pond (feature 3, figure 15). In addition, three ponds are located near the preliminary bike trail alignment (features 4, 5, and 7, figure 15). Although these ponds are not natural karst features, they are points where surface water may enter the karst system and are considered features of interest based on the karst assessment (NPS 2022). As discussed in the "Mitigation Measures" section, direct disturbance to these ponds would be avoided during the design and construction process by establishing minimum 60-foot riparian buffers around them. No ground disturbance would occur within the established buffers during construction, and natural vegetation would be allowed to grow in the buffers. In addition, the access road, trailhead areas, and trails would be designed to minimize alteration of existing drainage into and out of these features.

Portions of the preliminary alignment of the bike trail system are adjacent to or in the vicinity of four karst-like features shown in figure 15. These karst-like features include two closed depressions—Laurel Ridge 1 and Laurel Ridge 2 (features 8 and 9), a sinking stream (feature 10), and Katy Hollar Pond 2 (feature 11). Direct disturbance to these karst-like features would be avoided during the design and construction process by establishing a buffer around them. The avoidance buffer size would be consistent with those established for water resources and based on the best professional judgement of technical specialists knowledgeable of the specific karst feature and local karst resources.

No ground disturbance would occur within established buffers during construction, and natural vegetation would be allowed to grow in the buffers. In addition, the access road, trailhead areas, and trails would be designed to minimize alteration of existing drainage into and out of these features.

The northern end of the access road would be about 400 feet from an undetermined feature (feature 1) and a spring (feature 2). As discussed in appendix F, the access road on the north side of Cove Creek and the bridge over Cove Creek would be designed and constructed to minimize impacts on wetlands and floodplains. The access road in this area would follow an existing unpaved, maintained roadbed that was built in the 1980s. Wetlands exist on either side of the existing roadbed, but construction would affect only about 21 square feet of wetlands. The bridge would span the 100-year floodplain of Cove Creek. Alternative 2 would not affect features 1 or 2 based on the presence of the existing roadbed, minimal new disturbance in this area, and distance to these features.

Subsurface features associated with mantled karst could be encountered during grading and excavation under alternative 2. If soil-filled voids or open conduits exist beneath the area of disturbance, the soil could begin to shift, and previously undetected sinkholes could begin to form upon removal of vegetation and topsoil. While mantled karst could occur throughout the project area, risk is higher south of Katy Hollar Road and in areas of highly cohesive soils (Denton 2013). Alternative 2 would alter approximately 11.8 acres of soils typically associated with karst, specifically the Braddock and Steadman series. The potential of encountering subsurface features is greatest during road, bridge, and trailhead area construction based on the extent and depth of excavation required. The potential of encountering subsurface features in trail construction is much lower because grading would be kept to a minimum, and the trails would only be 4 feet wide. As discussed in the "Mitigation Measures" section, additional geotechnical surveys (geophysical surveys and borings) would be conducted during the design process to determine the presence of underground karst features below the proposed road and trailhead areas prior to any ground disturbance associated with construction. Survey results would be used to modify the site plan as needed to avoid underground karst features and inform road, bridge, building, septic, and stormwater design. If the alternative is modified based on survey findings, NPS would determine if additional NEPA documentation is required and identify the appropriate level of documentation in accordance with CEQ regulations and the NPS NEPA Handbook (NPS 2016). NPS would not implement the action until any required additional NEPA review is complete.

Development proposed under alternative 2 has the potential to increase the rate and volume of stormwater runoff in the project area associated with the increase in impervious surface, compaction of soils, and alteration of grade and slope. As discussed in the "Affected Environment" section for karst resources, increased runoff in karst landscapes can increase risk of new sinkhole formation, change groundwater recharge, and increase the risk of groundwater and surface water contamination. Because disturbance under alternative 2 would be greater than 5,000 square feet, Section 438 of the Energy Independence and Security Act of 2007 requires that the project maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. As outlined in the "Mitigation Measures" section, stormwater management would be an integral part of project design and construction. A site-specific stormwater pollution prevention plan would be developed and implemented in accordance with the NPDES permit for construction activities for the project. Permanent stormwater management measures would be designed following karst-specific guidelines, including those found in *Appendix B - Stormwater Design Guidelines for Karst Terrain* of the *Tennessee Permanent Stormwater Management and Design Guidance Manual* (TDEC & UT 2014). Stormwater management measures would be designed to widely distribute infiltration rather than focused infiltration. Focused infiltration, such as large stormwater retention basins, is typically undesirable in karst environments because it directs surface water into one location instead of across a broader area, which may promote dissolution of underlying bedrock and create new discrete points of groundwater recharge. The stormwater system would be designed to treat runoff in a series of small runoff reduction practices before it becomes concentrated. Stormwater management measures would be designed to maintain the quality and quantity of runoff to predevelopment levels and minimize rerouting of stormwater from existing drainages to the maximum extent technically feasible.

As noted in the "Soils" section, the preliminary layout of the trail system used natural topography to minimize stormwater-related impacts. These impacts would be further limited by design methods, including the use of sustainable design practices such as grade reversals and drainage installations. These methods would quickly eliminate water from the upland trail system after a rain event, prevent concentration of runoff, and allow for dispersed infiltration of runoff.

Karst-like features could constrain construction of the subsurface sewage disposal systems and must be considered to prevent unsafe movement of wastewater and migration of pollutants (e.g., nutrients, *E. coli*, and fecal coliform) to groundwater and surface waters. The preliminary design does not locate the restroom facilities near any karst-like features; however, site-specific geotechnical and geophysical

surveys would be completed, as applicable, during the design process to confirm that the construction and operation of the sewage system would not affect karst resources. If site-specific surveys indicate that the site is not suitable for conventional subsurface disposal, the Park would consider other wastewater management options such as installation of vault toilets or pumping and hauling wastewater to an existing municipal wastewater treatment plant.

Overall, the proposed development under alternative 2 would be designed to avoid and buffer karst features, maintain the quality and quantity of runoff to predevelopment levels, and minimize rerouting of stormwater from existing drainages to minimize the potential for impacts on karst resources. The application of mitigation measures and the adherence to stormwater management and NPDES requirements would further limit the potential effect on karst resources.

Cumulative Impacts: Continued residential development, including the addition of new septic systems and wells in Wears Valley have increased the potential for contamination (septic systems) and the use of groundwater (wells) in the existing karst environment in the vicinity of the project area. This development could result in increased drawdown of the groundwater within the aquifer and raise the potential for pollutant loading. In addition, new paved areas, including the potential development of Parkway Section 8D would increase the amount of impervious area in Wears Valley and contribute to additional stormwater runoff in certain areas, potentially altering the existing drainage patterns. Parkway Section 8D would also include development of a road corridor in the direct vicinity of Stupkas Cave and multiple confirmed sinkholes.

Alternative 2 could contribute to the potential for adverse impacts on karst in the project area from alterations to the existing stormwater runoff patterns, changes to the groundwater system from new septic systems, and introduction or alteration of preferential subsurface flow paths. Potential impacts would be limited with the implementation of karst-specific mitigation measures described in chapter 2. When the incremental impacts from alternative 2 are combined with the impacts from present and reasonably foreseeable actions, the overall cumulative impact on karst would be adverse, with the incremental impacts of alternative 2 contributing limited impacts.

Alternative 3—NPS Preferred Alternative

Impacts on karst under alternative 3 would be similar to those described under alternative 2. Under alternative 3, the mountain bike trail system would have a similar amount of total impervious surface but would have one combined developed trailhead area and only one restroom facility. While the total area of disturbance would be 25 acres, 3.0 more acres than alternative 2, there would be a total of 5.7 acres of impervious surface, 0.1 acres more than alternative 2, which would still be approximately 1% of the project area. The karst-related issues and potential impacts would be the same as those described for alternative 2. Alternative 3 would alter 15.6 acres of soils typically associated with karst, specifically the Braddock and Steadman series.

Under alternative 3, the proposed trailhead location would not be adjacent to any karst-like features or features of interest. Because of similar trail layouts that use the natural topography of the site, alternative 3 would be similar to alternative 2, with four karst-like features and three ponds located near the preliminary bike trail alignment (features 4, 5, and 7 through 11, figure 15). While farm pond 3 would not be adjacent to the trailhead under alternative 3, it would be near the pedestrian trail and access road. As discussed in the "Mitigation Measures" section, direct disturbance to these karst-like features and ponds would be avoided during the design and construction process by establishing buffers around them. Additionally, geotechnical surveys (geophysical surveys and borings) would be conducted during the design process to determine the presence of underground karst features below the proposed road and trailhead areas prior to any ground disturbance. Survey results would be used to modify the site plan as needed to avoid underground karst features and inform road, bridge, building, septic, and stormwater design. If the alternative is modified based on survey findings, NPS would determine if additional NEPA documentation is required and identify the appropriate level of documentation in accordance with CEQ

regulations and the NPS NEPA Handbook (NPS 2016). NPS would not implement the action until any required additional NEPA review is complete.

Overall, alternative 3 would result in similar impacts on karst compared to alternative 2. While there would be a slight increase in impervious surface (stormwater runoff) and an additional 1.3 acres of impervious surface on soils typically associated with karst, alternative 3 would include only one developed trailhead area and associated septic system, which would not be located adjacent to karst-like features or farm ponds, reducing the potential for contaminants to easily enter the groundwater system. Alternative 3 would result in approximately 3 acres of additional disturbance in the project area, primarily from the construction of pedestrian trails; however, the amount of overall new impervious surface would only be 0.1 acres more than under alternative 2. As a result, impacts on karst resources from the potential alteration of the existing volume, velocity, and quality of stormwater runoff under alternative 3 would be the same as those described for alternative 2. Overall, the proposed development under alternative 3 would be designed to avoid and buffer any karst features, maintain the quality and quantity of runoff to predevelopment levels, and minimize rerouting of stormwater from existing drainages to minimize the potential for impacts on karst resources. The application of mitigation measures and the adherence to stormwater management and NPDES requirements would further limit the potential effect on karst resources.

Cumulative Impacts: Impacts on karst from cumulative projects would be the same as those described for alternative 2. Alternative 3 could contribute to the potential for adverse impacts on karst resources in the project area by altering existing stormwater runoff patterns, changes to the groundwater system from one septic system, and introduction or alteration of preferential subsurface flow paths. Potential impacts would be limited as a result of the implementation of karst-specific mitigation measures, described in chapter 2. When the incremental impacts from alternative 3 are combined with the impacts from present and reasonably foreseeable actions, the overall cumulative impact on karst resources would be adverse, with the incremental impacts of alternative 3 contributing limited impacts.

Alternative 4

Impacts on karst under alternative 4 would be similar to those described under alternative 2; however, the smaller footprint and area of disturbance associated with alternative 4 would reduce the impact on karst resources compared to alternative 2. Under alternative 4, the shorter access road and associated trailhead would result in 2.2 acres of impervious surface, including 0.2 acres of impervious surface within soils typically associated with karst. In addition, no bike trails are proposed south of Katy Hollar Road. Total disturbance would be 11.6 acres, approximately half the disturbance expected from alternatives 2 and 3. The karst-related issues and potential impacts would be the same as described under alternative 2, but to a smaller extent.

Under alternative 4, the proposed trailhead location would not be adjacent to any karst-like features or features of interest. Because of similar trail layouts north of Katy Hollar Road that use the natural topography of the site, alternative 4 would be similar to alternative 3, with four karst-like features and three ponds located near the preliminary bike and pedestrian trail alignment (features 3, 4, and 7 through 11, figure 15). As discussed in the "Mitigation Measures" section, direct disturbance to these karst-like features and ponds would be avoided during the design and construction process by establishing buffers around them. Additionally, geotechnical surveys (geophysical surveys and borings) would be conducted during the design process to determine the presence of underground karst features below the proposed road and trailhead areas prior to any ground disturbance. Survey results would be used to modify the site plan as needed to avoid underground karst features and inform road, bridge, building, septic, and stormwater design. If the alternative is modified based on survey findings, NPS would determine if additional NEPA documentation is required and identify the appropriate level of documentation in accordance with CEQ regulations and the NPS NEPA Handbook (NPS 2016). NPS would not implement the action until any required additional NEPA review is complete.

Overall, alternative 4 would result in similar types of impacts on karst resources, but to a lesser extent compared to alternatives 2 and 3 because of the reduction in impervious surface (stormwater runoff), and the limited disturbance to soils typically associated with karst. As a result, impacts on karst resources from the potential alteration of the existing volume, velocity, and quality of stormwater runoff under alternative 4 would be less than those described for alternatives 2 and 3. Overall, the proposed development under alternative 4 would be designed to avoid and buffer any karst features, maintain the quality and quantity of runoff to predevelopment levels, and minimize rerouting of stormwater from existing drainages to minimize the potential for impacts on karst resources. The application of mitigation measures and the adherence to stormwater management and NPDES requirements would further limit the potential effect on karst resources.

Cumulative Impacts: Impacts on karst resources from cumulative projects would be the same as those described for alternative 2. Alternative 4 could contribute to the potential for adverse impacts on karst resources in the project area by altering existing stormwater runoff patterns, changes to the groundwater system from one septic system, and introduction or alteration of preferential subsurface flow paths. Potential impacts would be limited as a result of the implementation of karst-specific mitigation measures, as described in chapter 2. When the incremental impacts from alternative 4 are combined with the impacts from present and reasonably foreseeable actions, the overall cumulative impact on karst would be adverse, with the incremental impacts of alternative 4 contributing limited impacts.

CHAPTER 4: CONSULTATION AND COORDINATION

This "Consultation and Coordination" chapter describes the public involvement and agency consultation used during the preparation of the EA. A combination of activities, including internal scoping, has helped to guide NPS in developing this EA. This chapter provides a detailed list of the various consultations initiated during the development of the EA, as well as a list of recipients for this document.

PUBLIC PARTICIPATION AND SCOPING

THE SCOPING PROCESS

Scoping is an essential component of the NEPA planning process. The formal scoping process for this EA consisted of public scoping and consultation with federal and state agencies and tribal governments. Public engagement began in April 2020 with a civic engagement comment period for four transportation and access projects in the Tennessee portion of the Park, including the proposed action in this EA. The formal NEPA process and 30-day public scoping period was initiated on July 20, 2020, with the press release announcing the public scoping period and a newsletter release to Park stakeholders, partners, and adjacent property owners. In addition to the press release, NPS hosted two virtual public meetings on July 28 and July 30, 2020. During the public scoping period, NPS received 510 pieces of correspondence.

PUBLIC COMMENT

The Park initiated a 30-day public comment period for the October 2020 Wears Valley Mountain Bike Trail System EA on October 16, 2020. The public was invited and encouraged to provide feedback on the EA. During the comment period, a virtual public meeting was held over Zoom on October 29, 2020. The public was encouraged to submit comments through NPS's Planning, Environment, and Public Comment (PEPC) website and comments were also accepted by US mail and email. Twenty-two pieces of correspondence were received during the comment period. NPS responses to substantive public comments are provided in appendix D.

The Revised EA will be on formal public and agency review for 30 days. Interested individuals, agencies, and organizations will be notified of its availability. The Revised EA will be available for public review and comment on the NPS PEPC website https://parkplanning.nps.com/WearsValleyBikeTrails.

AGENCY AND TRIBAL CONSULTATION

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

NPS obtained an "official species list" for the project area from the USFWS Information for Planning and Conservation System in January 2020. While mist net surveys were originally scheduled for the spring, the USFWS bat handling protocol for COVID-19 recommended that all summer mist net surveys be postponed until there is a better understanding of the risk to North American bat species. As a result, NPS collaborated with USFWS staff on the methodology and approach to complete acoustic surveys in the project area and in adjacent areas of the Park. On June 5, 2020, the survey methodology was provided to and was approved by the Tennessee Ecological Services Field Office of USFWS. Acoustic surveys were completed in early August 2020. In accordance with section 7 of the ESA, NPS submitted the biological evaluation on October 9, 2020, and requested concurrence from USFWS that the preferred alternative may affect but is not likely to adversely affect Indiana bats and northern long-eared bats. On October 29, 2020, USFWS concurred with the Park's determination.

NATIONAL HISTORIC PRESERVATION ACT SECTION 106 AND TRIBAL CONSULTATION

The National Historic Preservation Act section 106 consultation process was initiated with the Tennessee state historic preservation officer (SHPO). NPS provided the draft area of potential effect (APE) and survey methodology. On March 12, 2020, the Tennessee SHPO concurred with the proposed APE and survey methodology. The Phase I Survey report and associated assessment of effect was submitted to the Tennessee SHPO on October 29, 2020. Based on findings of the archeological survey and the avoidance of potentially eligible sites, NPS made a preliminary determination that the preferred alternative (alternative 3) would have no adverse effect on archeological resources. On October 30, 2020, the Tennessee SHPO concurred that the preferred alternative would not adversely affect any historic property.

Letters were also sent to four Native American Tribes on April 9, 2020, with the draft APE and survey methodology. These tribes included: Eastern Band of the Cherokee Indians, Cherokee Nation, United Keetoowah Band of Cherokee Indians in Oklahoma, and Chickasaw Nation. The Cherokee Nation replied on November 2, 2020, and stated it did not object to the project proceeding but requested NPS re-contact the Tribe if the project changes or if items of cultural significance are discovered during the course of the project. No other responses were received.

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CHAPTER 6: ACRONYMS AND ABBREVIATIONS

APE	area of potential effect
BCC	Birds of Conservation Concern
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	environmental assessment
ESA	Endangered Species Act
GIS	geographic information systems
HUC	hydrologic unit code
IMBA	International Mountain Bike Association
MPH	miles per hour
NEPA	National Environmental Policy Act of 1969, as amended
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
PAOT	people at one time
Park	Foothills Parkway and Great Smoky Mountains National Park
Parkway	Foothills Parkway
PEPC	Planning, Environment, and Public Comment
SHPO	State Historic Preservation Office
TDEC	Tennessee Department of Environment and Conservation
TWRA	Tennessee Wildlife Resources Agency
USC	United States Code
USDA-NRCS	US Department of Agriculture-Natural Resources Conservation Service
USFWS	US Fish and Wildlife Service
WNS	white-nose syndrome

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CHAPTER 7: REFERENCES

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under US administration.

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