Great Smoky Mountains National Park

U.S. Department of the Interior
National Park Service

Wears Valley Mountain Bike Trail System
Environmental Assessment

October 2020

NPS cost associated with developing this EA: $813,700

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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) to evaluate alternatives for enhancing recreation through a mountain bike trail system within the Wears Valley portion of the Great Smoky Mountains National Park. This EA describes the environment that would be affected by the alternatives and assesses the environmental consequences of implementing the alternatives. It examines three action alternatives and one no action alternative.

NPS is also promulgating a special regulation that would designate the trail system as a bicycle route, as required by 36 Code of Federal Regulations (CFR) 4.30 and *NPS Management Policies* 2006 (Section 9.2.2.4). The proposed rule will be available for a 60-day public comment period through the federal eRulemaking portal at www.regulations.gov. The 60-day comment period will run in parallel with the comment period for this EA.

This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; regulations of the Council on Environmental Quality (40 Code of Federal Regulations 1500–1508); 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:

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Gatlinburg, TN 37738

Note to Reviewers and Respondents:

If you wish to comment on this 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 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) is preparing 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 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. This EA was 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 were made effective September 14, 2020. NEPA documents already in progress are authorized to complete the NEPA process under the existing 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. Previous NPS planning documents include various recreational development concepts featuring facilities such as a campground, picnic area, fishing lake, and horse trails. Build-out of these concepts has not been achieved because Section 8E of the Parkway, which connects to the northern end of Section 8D and provides improved access to this area, 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, which identified Wears Valley as the most extensively developed area along the Parkway.

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. According to the *Master Plan*, where Sections 8E and 8D meet in Wears Valley, was planned to become the most extensively developed area on the Parkway (NPS 1968). The Parkway provides motorists with access to scenic views of the Park, access to recreational activities, and a free-flowing scenic drive.

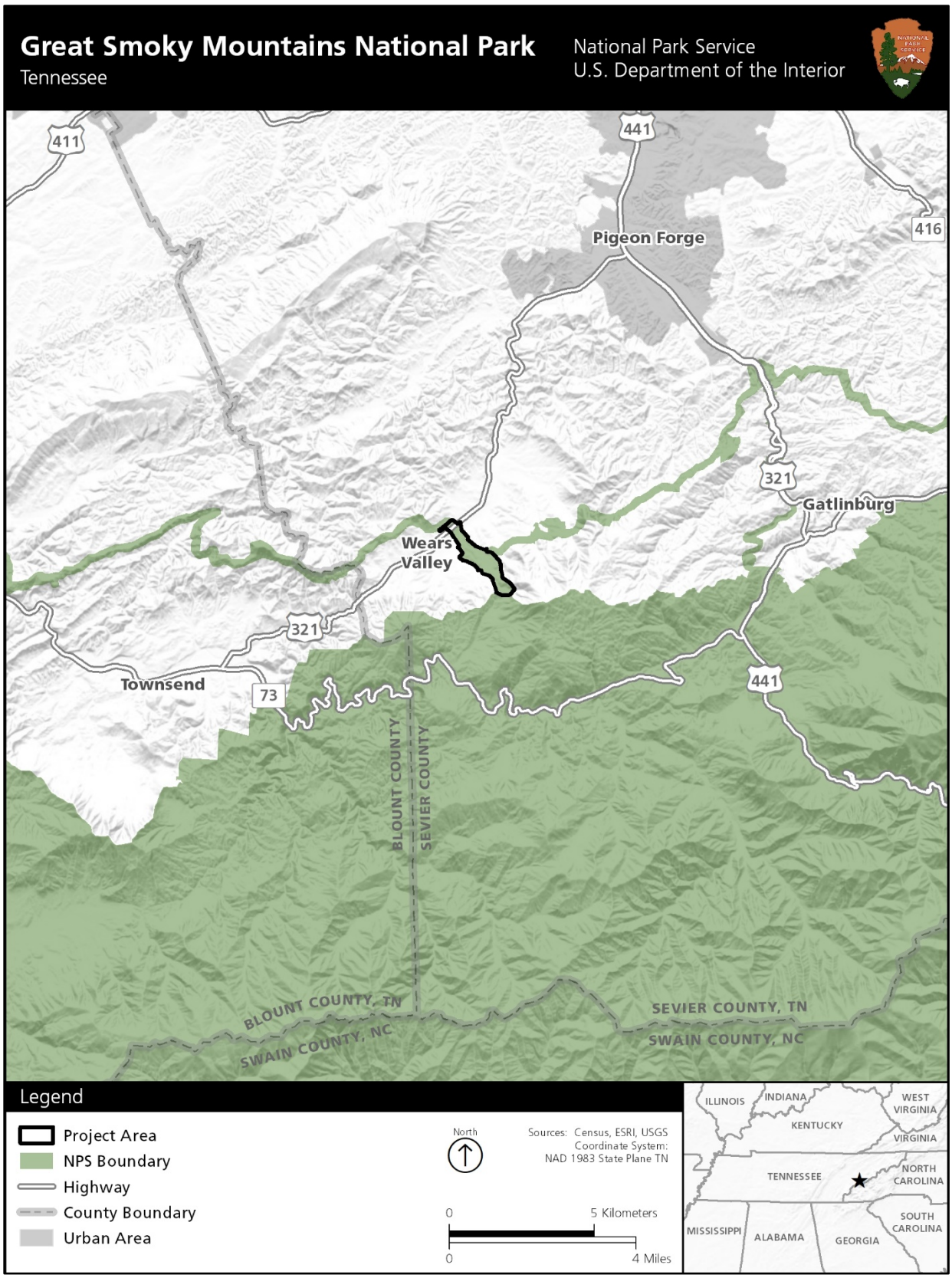

FIGURE 1. PROJECT VICINITY

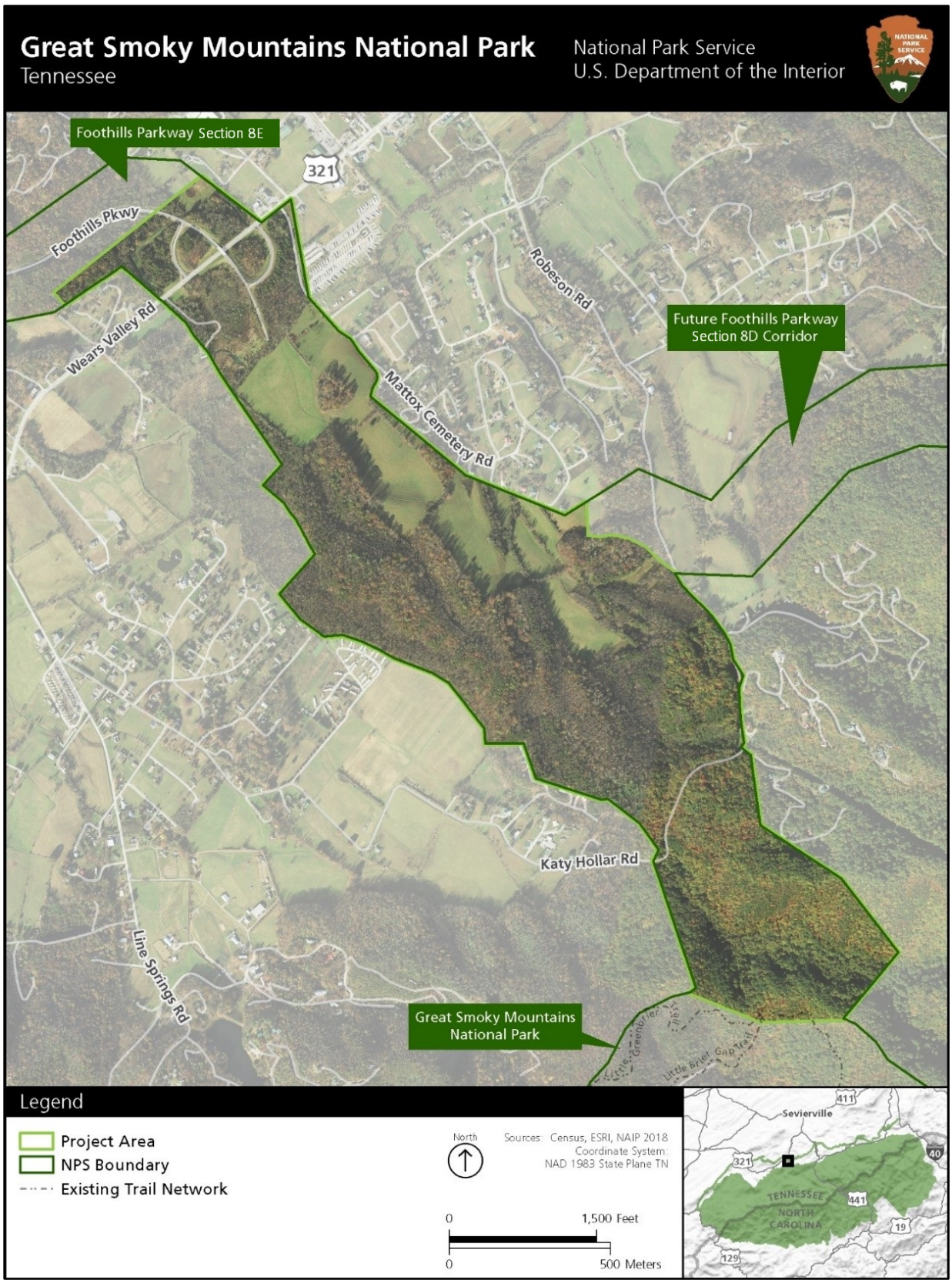

FIGURE 2. PROJECT AREA

RELATIONSHIP TO PREVIOUS PLANNING FOR WEARS VALLEY

As documented in agency law and 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 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 EA does not preclude the Park from pursuing additional development options identified elsewhere in the planning portfolio as the Parkway is further constructed.

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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 Code of Federal Regulations [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 EA: the no action alternative and three action alternatives.

In addition to the NEPA process, NPS is also promulgating a special regulation that would designate the trail system as a bicycle route, as required by 36 CFR 4.30 and *NPS Management Policies* 2006 (Section 9.2.2.4). The proposed rule will be available for a 60-day public comment period through the federal eRulemaking portal at www.regulations.gov. The 60-day comment period will run in parallel with the comment period for this EA.

NPS is also completing 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 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.

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

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.

FIGURE 3. VISUALIZATION OF THE MOUNTAIN BIKE TRAIL SYSTEM IN THE PROJECT AREA (OPEN FIELD)

FIGURE 4. VISUALIZATION OF THE MOUNTAIN BIKE TRAIL SYSTEM IN THE PROJECT AREA (WOODED)

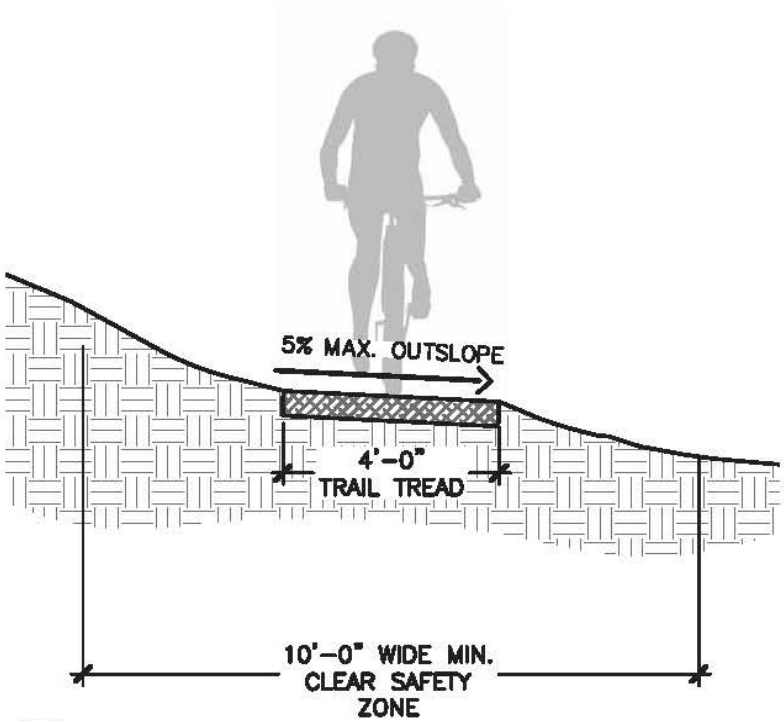

FIGURE 5. TYPICAL MOUNTAIN BIKE TRAIL CROSS SECTION

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.

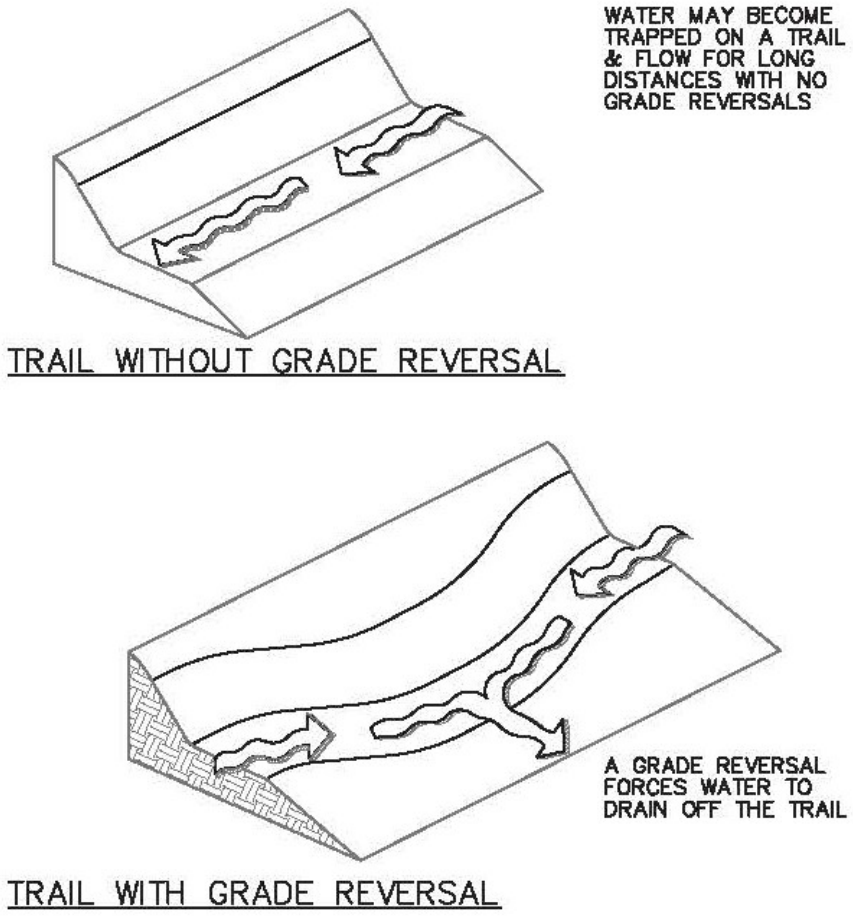

FIGURE 6. GRADE REVERSAL TRAIL DESIGN

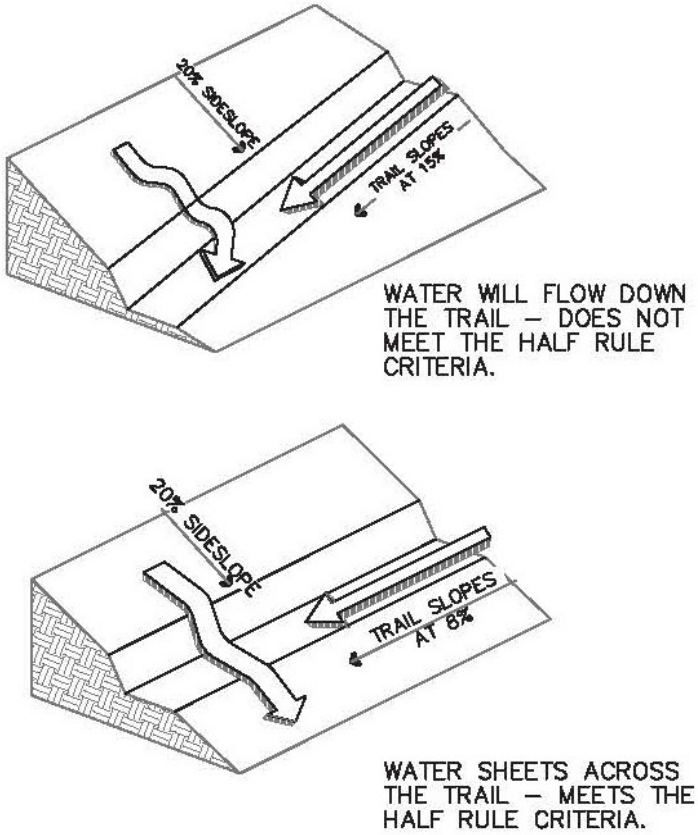

FIGURE 7. HALF SLOPE CRITERIA FOR TRAIL DESIGN

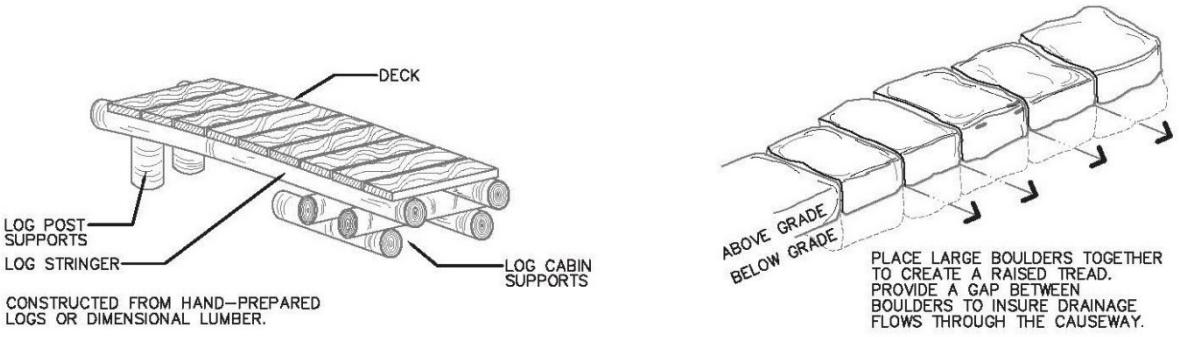

FIGURE 8. EXAMPLE WOODEN DECK LADDER BRIDGE AND BOULDER CAUSEWAY

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.

This 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 authorized, non-motorized bicycles and Class 1 and Class 2 electric bicycles (e-bikes) would be authorized on the mountain bike trails. The use of Class 3 e-bikes would be prohibited. See appendix C for additional details and definitions for e-bike classes.

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, or 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 (future 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.

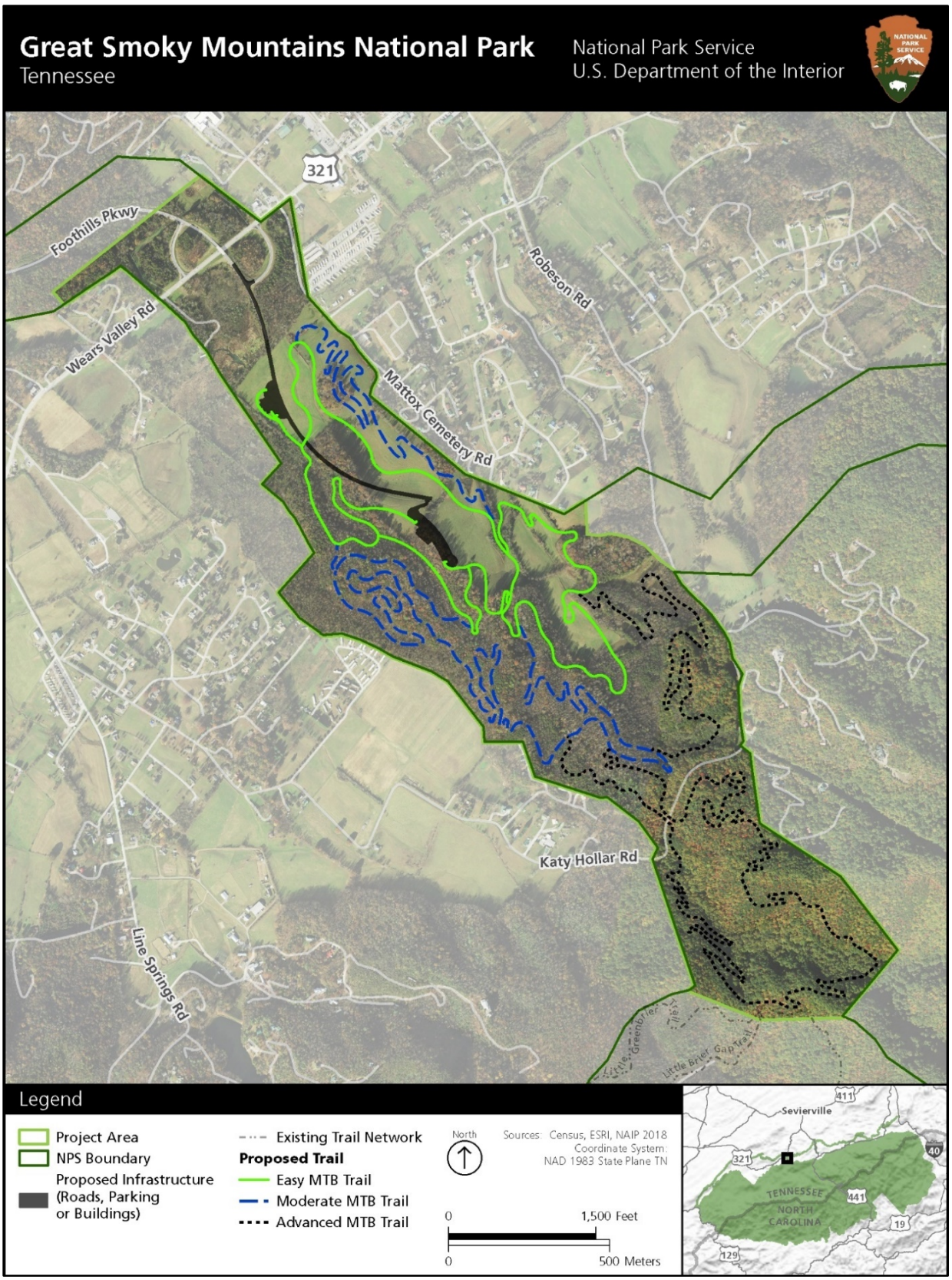

FIGURE 9. ALTERNATIVE 2

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 2.4 miles of pedestrian-only trails in the project area for a total of 14.2 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 EA assumes the trailhead would be located completely within the forested area.

Overall, alternative 3 would require 25.5 acres of disturbance during the construction period. Of these 25.5 acres, 5.7 acres would be impervious surfaces for buildings, road, and parking areas and 11.9 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.

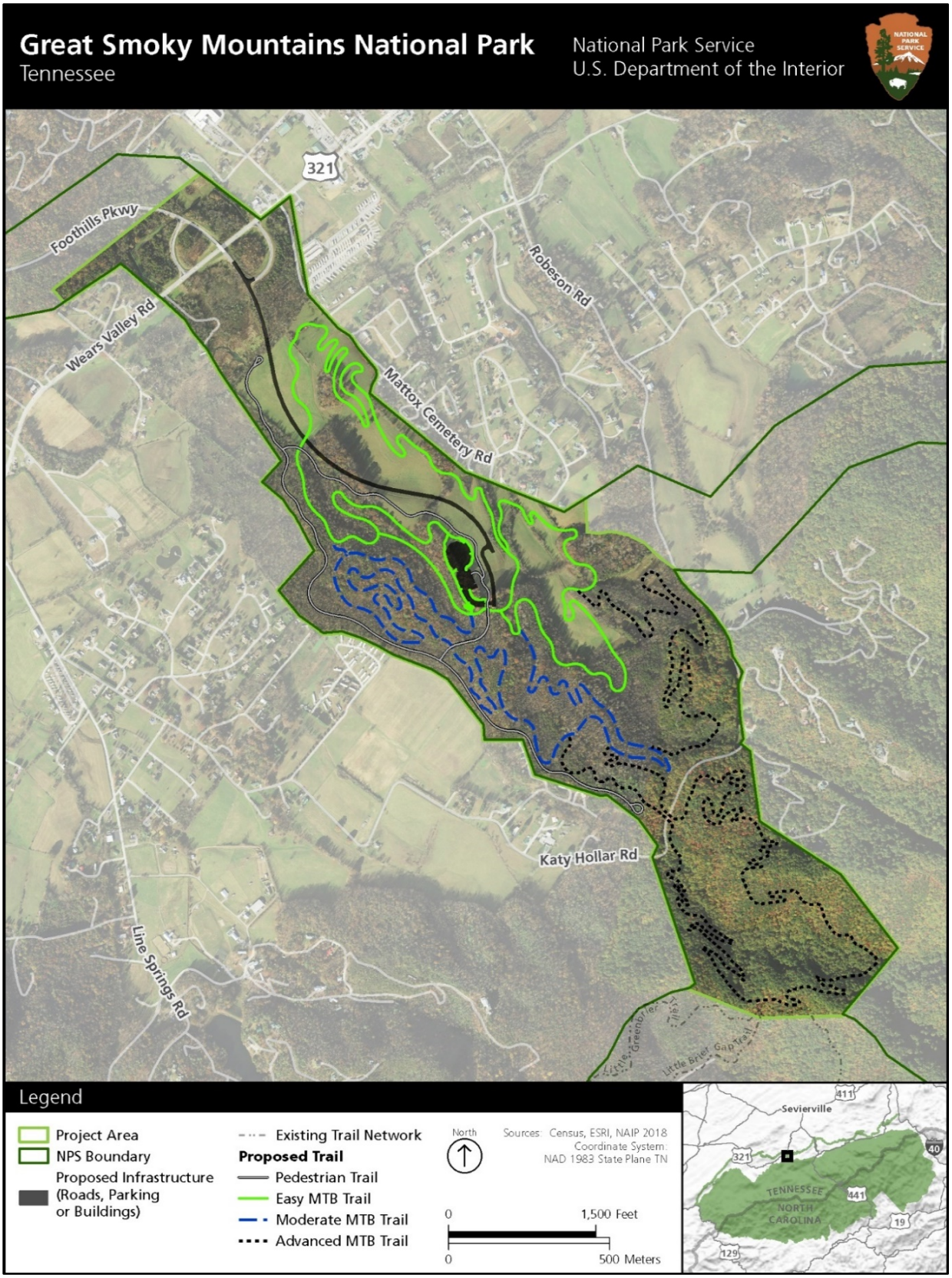

FIGURE 10. ALTERNATIVE 3—NPS PREFERRED ALTERNATIVE

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 2.1 miles of pedestrian-only trails in the project area for a total of 10.6 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 11.9 acres of disturbance during the construction period. Of these 11.9 acres, 2.2 acres would be impervious surfaces for buildings, road, and parking areas, and 8.3 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.

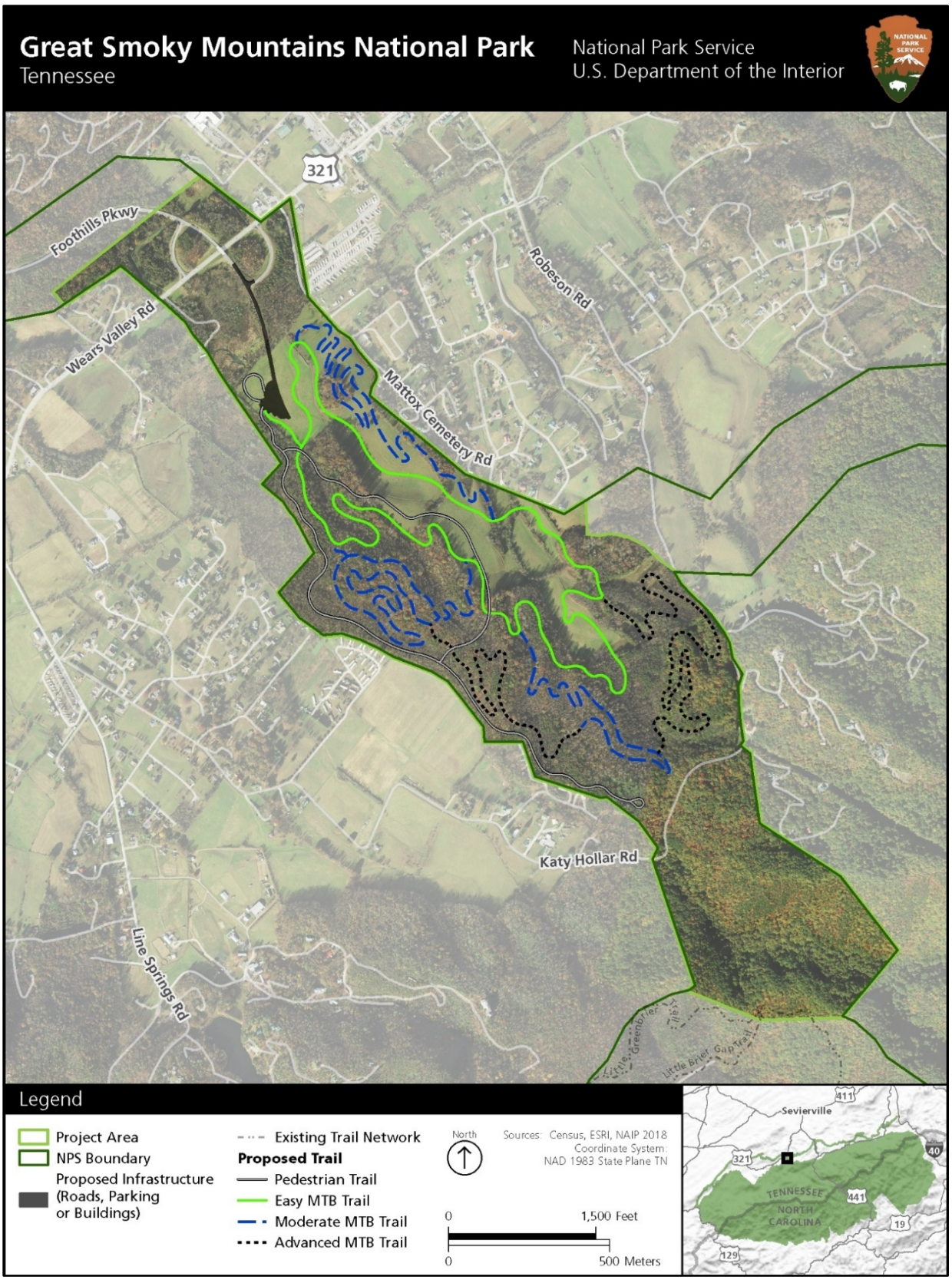

FIGURE 11. ALTERNATIVE 4

SUMMARY OF ALTERNATIVES

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

TABLE 1. SUMMARY OF ACTION ALTERNATIVE ELEMENTS

Alternative Element	Alternative 2	Alternative 3	Alternative 4
Trail Length (Total)	12.8 miles	14.2 miles	10.6 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	2.4 miles	2.1 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	17.6 acres	10.5 acres
Bridge Footprint (Raised)	0.2 acres	0.2 acres	0.2 acres
Total Footprint	22.3 acres	25.5 acres	11.9 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 any 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.
- 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.
- 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 material (no "photodegradable" plastic is authorized).
- Construct a wildlife tunnel for amphibians and 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.

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, when indicated and approved by the Wildlife Branch Chief.
- Remove hazard trees only in consideration of bat protection requirements. If hazard tree removal 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 surveyed at a later date or mist netting could be used to determine the species.

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

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 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 Foothills 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 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 as part of a reasonably foreseeable project, the Metcalf Bottoms Access Improvements.
- **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. Instead, safety features were incorporated into the action alternatives. A bike trail bridge or tunnel across Katy Hollar Road may be considered as part of the Metcalf Bottoms Access Improvements project, which could include a road extending from the project area into Metcalf Bottoms and may offer the opportunity to include a bike bridge or tunnel.

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.

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 D. Issues carried forward for detailed analysis fall under the following impact topics:

- Surface Waters
- Vegetation
- Soils
- Visitor Use and Experience
- Wildlife, including Threatened and Endangered Species

As detailed further in appendix D, 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 E.

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 • Metcalf Bottoms Access Improvements
Surface Water	General vicinity within the watershed	• Parkway Section 8D and 8E • Residential Development in Wears Valley • Metcalf Bottoms Access Improvements
Vegetation	1-mile radius from our Project Area, to include the Metcalf Bottoms project area	• Foothills Parkway Section 8D and 8E • Residential Development in Wears Valley • Metcalf Bottoms Access Improvements
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 Trail System in Parkway Section 8A • Look Rock Campground Rehabilitation
Wildlife, including Threatened and Endangered Species	General vicinity of the project area	• Foothills Parkway Section 8D and 8E • Residential Development in Wears Valley • Metcalf Bottoms Access Improvements

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

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 anticipated to begin in 2021 to replace the potable water system, repave the roads, and rehabilitate the campground.

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 season, which started on June 17 and concluded on September 30. During this time, the Park did not continue the Saturday

morning vehicular closures. The park will assess this new schedule and make a determination for future bicycle day closures.

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 (U.S. Census, 2019).

Reasonably Foreseeable Future Actions

Development of Mountain Bike Trails within Foothills Parkway Section 8A. 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 Section 8A, located in Cocke County. The planning effort is beginning and is being led by US Forest Service. The plan envisions a trailhead and between 50 to 75 miles of trails on mostly Forest Service land but would likely use a portion of Parkway land to access the trail system.

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 2021. 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, including evaluating the feasibility of a new connector road from the planned Parkway Section 8D in Wears Valley to Little River Gorge Road in Metcalf Bottoms. 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, which could also include a turnaround area on Wear Cove Gap Road, will be analyzed during the planning process to address the deficiencies of Wear Cove Gap Road and to provide direct access to the Park from the Foothills Parkway as envisioned in the original *Foothills Parkway Master Plan*. The NEPA process is anticipated to begin in 2021.

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. The feasibility study is ongoing and, if feasible, NPS anticipates the NEPA process would begin in 2021.

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).

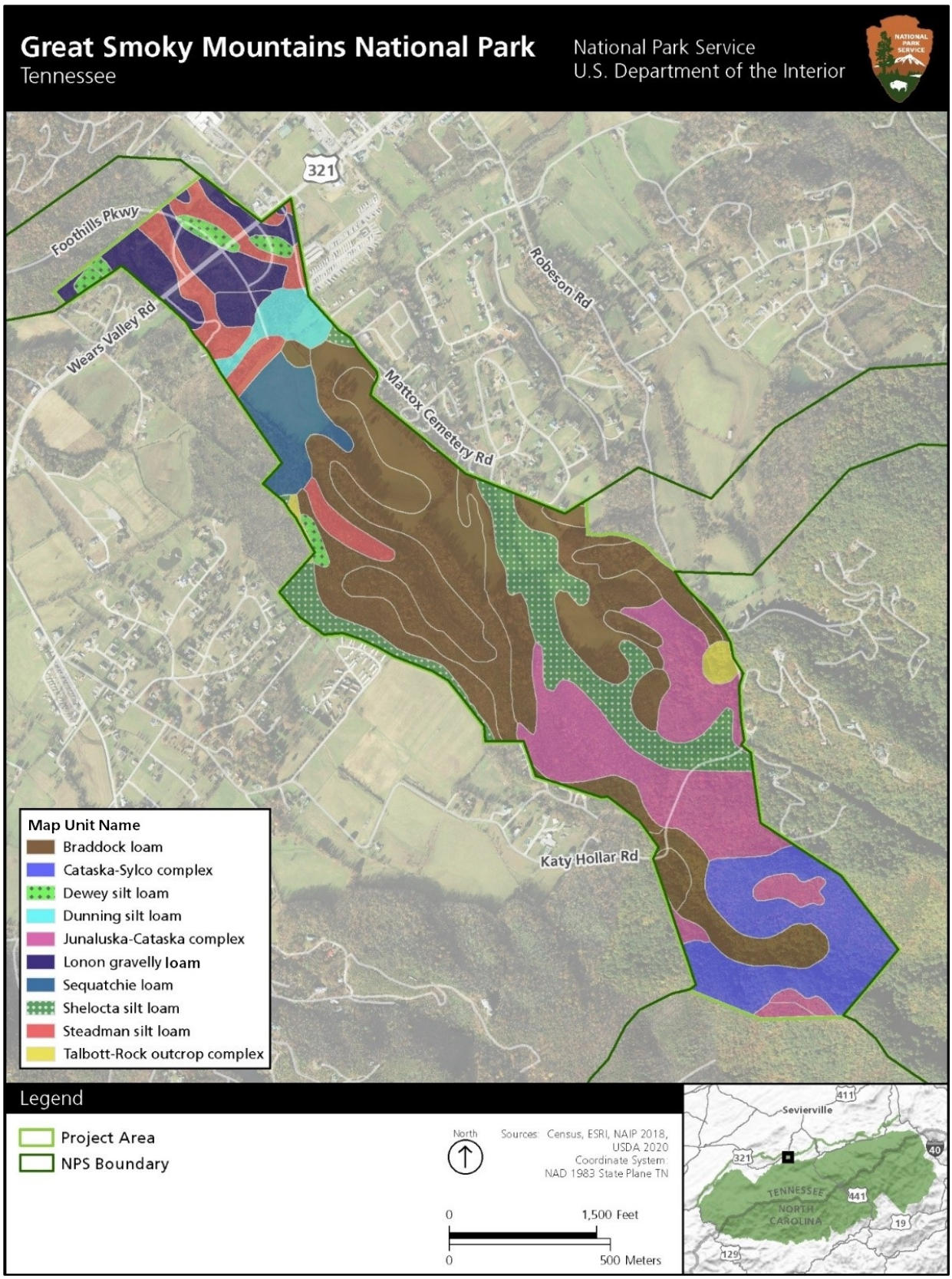

FIGURE 12. SOILS MAP UNITS IN THE PROJECT AREA

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 and the Metcalf Bottoms Access Improvements, both of which could potentially result in additional road development in the project area. Both projects could disturb additional soils in the project area by developing new roads. The Metcalf Bottoms Access Improvements would also potentially include a new connector road within the steep topography south of Katy Hollar Road. Both projects 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 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 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 25.3 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 3.1 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	3.2	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	**25.3**	**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 25.3 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 19.4 acres would include both temporary impacts from cut and fill activities (7.7 acres) and construction of the mountain bike trails (11.9 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 cumulative projects 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, 11.7 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. Approximately 1.6 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. 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	1.6	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	**11.7**	**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 11.7 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 trails (8.3 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 cumulative projects 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 E. 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).

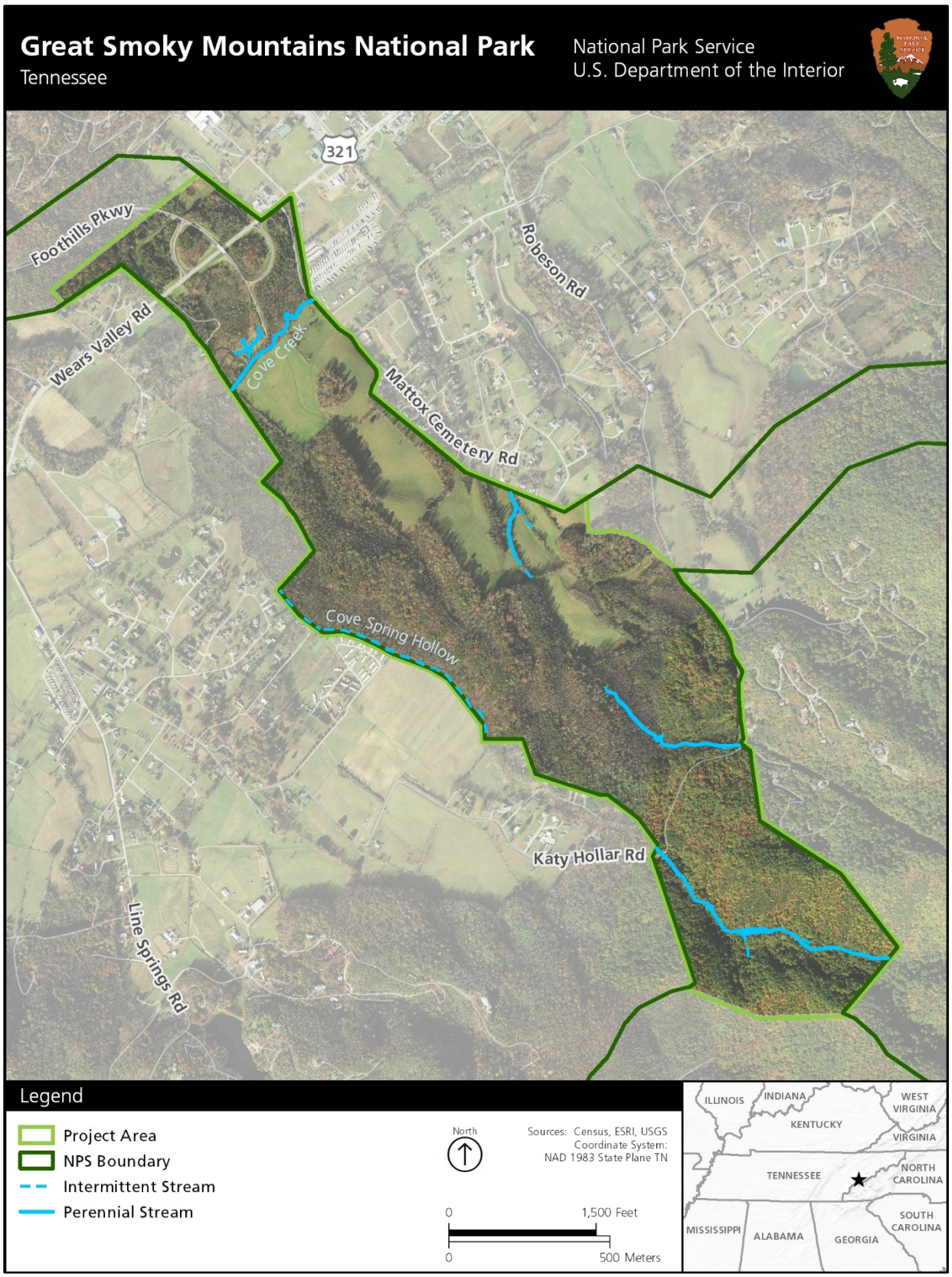

FIGURE 13. STREAMS IN THE PROJECT AREA

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 likely 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.

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 would cause wear to the dirt trail surface and possibly widen these 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.

The project area is underlain by Jonesboro limestone, and known karst features exist in the Wears Valley area. Karst is a type of landscape where the dissolving of the bedrock has created sinkholes, sinking streams, caves, springs, and other characteristic features. Karst is associated with soluble rock types such as limestone, marble, and gypsum (NPS 2018). Stupkas Cave and several sinkholes are present about 0.5 miles northeast of the project area in the Section 8D corridor. No caves or sinkholes have been identified in the project area. It is possible that unidentified sinkholes that have been filled with soil exist in in the project area, particularly in topographically low areas (NPS 1994).

If present, sinkholes or inadequate soils could present constraints to construction of the subsurface sewage disposal systems and must be considered to prevent lateral movement of wastewater and migration of pollutants (e.g., nutrients, *E. coli*, and fecal coliform) to surface waters. Based on TDEC data, portions of Cove Creek downstream of the project area appear to be polluted by residential septic systems (TDEC 2020b). The potential for pollutant migration to surface water would be higher at the north trailhead compared to the south trailhead, given its proximity to Cove Creek (<150 feet) in a low-lying area. The south trailhead would be located about 0.65 miles away from Cove Creek near the ridge line. Potential impacts on surface water from operation of the subsurface sewage disposal system would be avoided through proper system design and maintenance. If site-specific geotechnical and soil surveys indicate that the site is not suitable for subsurface disposal, the Park would consider other wastewater management options such as installation of vault toilets and pumping and hauling wastewater to an existing municipal wastewater treatment plant.

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 and a connector road as part of the Metcalf Bottoms Access Improvements 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 25.3 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 14.4 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. 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 (11.7 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 6.5 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 alternative would include 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. Same as alternative 2, trail design, surface waters 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).

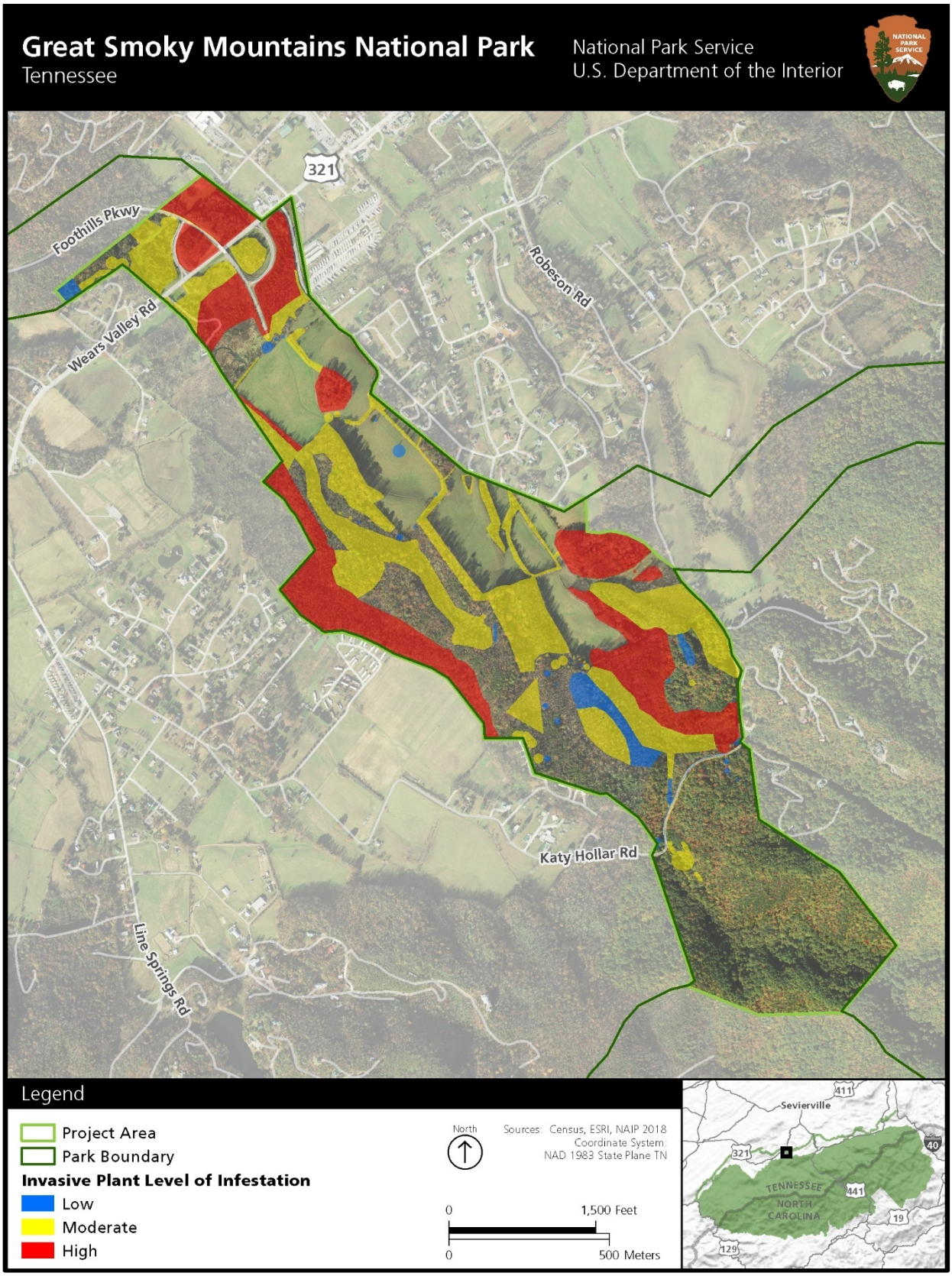

FIGURE 14. LEVEL OF INFESTATION BY NON-NATIVE INVASIVE PLANT SPECIES

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 up to 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 and a connector road as part of the Metcalf Bottoms Access Improvements could remove up to an additional 120 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 14.4 acres of forest would be cleared—1.1 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	12.0	3.8%
Forest - Total	**14.4**	**4.6%**
Open Field - Temporary	4.8	5.3%
Open Field - Permanent	5.1	5.8%
Open Field - Total	**9.9**	**11.1%**

While 14.4 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 24.4 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 10.7 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	6.2	2.0%
Forest - Total	**6.5**	**2.1%**
Open Field - Temporary	0.4	0.5%
Open Field - Permanent	3.8	4.2%
Open Field - Total	**4.2**	**4.7%**

While 6.5 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 (6.2 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 10.7 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 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 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. Parkway Section 8D would complete the connection between the Gatlinburg Spur and the Parkway to the west, while the Access Improvements could reduce or eliminate access 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 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 F. 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 F 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 F).

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 it 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. 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 hibernate 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 Metcalf Bottoms Access Improvements and 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—Proposed Action Alternative 2

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 14.4 acres of forested habitat in the project area, which is 1.1 acres 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 12.0 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 25.5 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 14.4 acres of forested habitat of which 12.0 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 0.8 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 12.0 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 (12.0 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 11.9 acres. Impacts on forest birds would be less than alternative 2 because approximately 6.5 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 6.5 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 6.5 acres of forested habitat in the project area and noise associated with construction and maintenance activities. The removal of 6.5 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.

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

As noted in chapter 2, NPS is also promulgating a special regulation that would designate the trail system as a bicycle route, as required by 36 CFR 4.30 and *NPS Management Policies* 2006 (Section 9.2.2.4). The proposed rule will be available for a 60-day public comment period through the federal eRulemaking portal at www.regulations.gov. The 60-day comment period will run in parallel with the comment period for this EA.

AGENCY 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 in October 2020 and has requested concurrence from USFWS that the Preferred Alternative may affect but is not likely to adversely affect Indiana bats and northern long-eared bats. The Park will complete the section 7 consultation process prior to finalizing the NPS decision document for this EA.

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 was submitted to the Tennessee SHPO on October 6, 2020, and is currently under review.

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. No responses were received.

Based on findings of the archeological survey and the avoidance of potentially eligible sites, NPS has made a preliminary determination that the preferred alternative (alternative 3) would have no adverse effect on archeological resources. A final determination of effect is pending completion of the section 106 process, including consideration of any public comments on this EA and ongoing consultation with Tennessee SHPO and traditionally associated Native American Tribes. The park will complete the section 106 consultation process prior to finalizing the NPS decision document for this EA. Furthermore, if additional information on ethnographic resources or traditional uses is provided by the Tribes, the Park will work with concerned parties to avoid any potential impacts associated with the proposed action.

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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
e-bike	electric bicycle
ESA	Endangered Species Act
GIS	geographic information systems
HUC	hydrologic unit code
IMBA	International Mountain Bike Association
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
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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APPENDIX A: PREVIOUS PLANNING EFFORTS

Foothills Parkway Master Plan – 1968

The *Foothills Parkway Master Plan* completed in 1968 envisions a pattern of use and recommends a program of visitor services and resource management designed to meet the needs of Foothills Parkway (Parkway) visitors. The Parkway's construction began in 1960 with 30 of 76 planned roadway miles open at the time of the master plan. The document reviews the Foothills Parkway's history, existing conditions, and intended use and trends.

The Parkway serves two purposes: (1) to provide an appropriate view of Great Smoky Mountains National Park (the Park), and (2) to afford recreational and access opportunities for pleasure driving, sightseeing, and other local activities. Objectives of the plan include maintaining and expanding the Parkway while preserving scenic lands, providing adequate recreational facilities, and assuring the Parkway can be accessed from major roads. Natural population growth of surrounding areas is expected to lead to increased use of the Parkway.

Specific to the project area, the Wear Cove area was intended to be the most extensively developed area on the Parkway. Planning facilities include a visitor station, 250 campground sites, 200 picnic areas, an amphitheater, seasonal and permanent residences, an employee trailer court, and a maintenance area. The plan also notes the potential for a small fishing lake and discusses the purposeful connection of the Parkway right-of-way into the Park boundary, which would allow for a one-way loop road opportunity from Metcalf Bottoms to the Parkway.

General Management Plan Final Environmental Impact Statement – 1982

Great Smoky Mountains National Park's General Management Plan was published in 1982. The Plan serves as both a manager's guide for meeting objectives established for the Park and a public statement of the National Park Service's management intentions. The plan establishes long-range strategies for resource management, visitor use, and development of an integrated park system, thereby creating a framework for all future programs, facilities, and management actions.

The GMP places the Parkway in the transportation subzone of the development zone and classified that Wear Cove in the general park development subzone of the development zone. Wear Cove is planned for park visitor and management facilities. Parkway-wide, the GMP includes bicycle paths within the Parkway right-of-way wherever feasible, noting that some paths could be on the Parkway roadway, while others could be located away from the roadway. The GMP envisions bicycle rental stations that would be identified in future development concept plans for Wear Cove and Oconaluftee. The GMP also expands on the *Foothills Parkway Master Plan* vision for Wear Cove and discusses a 4-mile road between Metcalf Bottoms and Wear Cove by way of the Little Brier Gap. At Wear Cove, the GMP analyzes the specific facilities proposed in the *Foothills Parkway Master Plan*, including a visitor center, 200-site picnic area, 8 seasonal employee residences, a maintenance area, utility systems, and a ranger station and residence.

Metcalf Bottoms/Wears Valley development Concept Plan / Environmental Assessment – 1984

The 1984 *Metcalf Bottoms/Wears Valley Development Concept Plan/Environmental Assessment* describes a proposed plan and two additional alternatives to bridge the gap between the presentation of broad concepts for the Metcalf Bottoms/Wears Valley area laid out in the 1982 *General Master Plan* and a comprehensive design for facilities to fulfill those concepts. The project area includes the Metcalf

Bottoms picnic area, Little Greenbrier Cove, Wears Cove Gap Road between the Park boundary and Little River Road, and the Parkway right-of-way through Wears Valley.

Goals laid out in the 1982 *General Master Plan* includes providing a visitor use and park operations node along the Parkway. Specific to Wears Valley, the plan includes construction of a new residence/ranger station, a four-unit apartment complex for employees, a new picnic area, and a 10-mile horse trail loop originating in Wears Valley. The proposal also includes hiring staff to manage and work in the area.

APPENDIX B: VISITOR USE MANAGEMENT AND THE PLANNING PROCESS

Overview

Visitor use management is the proactive and adaptive process of planning for and managing characteristics of visitor use and its 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 National Park Service (NPS) managers strive to maximize opportunities and benefits for visitors, while achieving and maintaining desired conditions for resources and visitor experiences in a particular area. Managing visitor access and use for visitor enjoyment and resource protection is inherently complex. It requires that managers analyze not only the number of visitors but also where they go, what they do, their impacts on resources and other visitor experiences, and the underlying causes of those impacts. Managers must acknowledge the dynamic nature of visitor use, the vulnerabilities of natural and cultural resources, and the need to be responsive to changing conditions.

The environmental assessment (EA) uses the visitor use management framework to develop a long-term strategy for managing visitor use within the proposed Wears Valley mountain bike trail system. The general planning process used for this plan is outlined below and is consistent with the guidance outlined by the Interagency Visitor Use Management Council (IVUMC 2016).

Desired Conditions

Desired conditions are aspirational statements that articulate what areas of the park would look, feel, sound, and function like in the future. *NPS Management Polices 2006* define desired conditions as "a park's natural and cultural resource conditions that NPS aspires to achieve and maintain over time, and the conditions necessary for visitors to understand, enjoy, and appreciate those resources (NPS 2006)." Desired conditions also provide basic criteria to evaluate the appropriate types and levels of management, development, and access needed to achieve those conditions. In this planning process, desired conditions guide the development of alternatives and provide indicators for monitoring and managing the designated mountain bike trails.

The process of establishing desired conditions for the proposed mountain bike trail system was informed by NPS policies and guidance, the *General Management Plan* (NPS 1982), the *Foundation Document* for the Great Smoky Mountains National Park (Park) (NPS 2016), civic engagement, and internal and external scoping. Desired conditions are listed below for natural resources, visitor use and experience, and park operations. These desired conditions do not replace desired conditions from other plans or policies; rather, they provide additional guidance for the project area regarding visitor use management.

Natural Resources—The following desired conditions were identified for natural resources:

- Maintain a mix of open fields, forests, and wetlands to provide visitors with opportunities to experience a variety of landscapes and vegetation communities. Natural processes predominate in forests and wetlands.
- Native plants predominate the area. Non-native, invasive plants are minimal or non-existent.
- Trailside vegetation is intact and relatively unharmed by trail use. Trail width is consistent with the original design.
- Bears and other wildlife maintain wild behaviors and are not habituated to food.

- Impacts to wildlife habitat are minimized to protect biodiversity and opportunities for wildlife viewing.

Visitor Use and Experience—The following desired conditions were identified for visitor use and experience.

- Visitors with a range of user skill levels experience a high-quality, sustainable, purpose-built mountain bike trail system.
- Visitor experience is not substantially degraded by crowding, congestion, user conflicts, or safety concerns.
- Visitors experience the scenic and varied beauty of the Foothills Parkway (Parkway) landscape and a trail system that traverses diverse terrain ranging from open, pastoral settings to forested, mountain settings.
- Visitors have the opportunity to engage in public education regarding mountain biking trail etiquette, trail rules, as well as safe and sustainable use that fosters visitor stewardship and a sense of shared responsibility for resource protection within the national park system.

Park Operations—The following desired conditions were identified for park operations:

- The Park is able to sustainably maintain and operate the infrastructure and amenities associated with the trail system.
- Park staffing levels are commensurate with visitation levels, ensuring protection of resources and visitor safety.

Indicators, Monitoring, and Management Strategies

Indicators translate the broad description of desired conditions outlined in above into measurable attributes that can be tracked over time to evaluate changes in resources or conditions that relate to visitor experience. They are a critical component of the visitor use management framework. The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described in this section were considered the most noteworthy, given the importance and vulnerability of the resources or visitor experiences affected by visitor use. In identifying meaningful indicators, the planning team also considered visitor use management issues in other areas of the Park. Indicators and associated potential management strategies that would be implemented as a result of this planning effort are described in the following sections. In general, indicators and associated monitoring and management strategies are applied across all action alternatives described in the environmental assessment (EA). Implementation of additional or refined strategies would be subject to the appropriate level of environmental compliance review in accordance with the National Environmental Policy Act (NEPA) and NPS policies. NPS would monitor the following indicators for natural resources and visitor use and experience.

INDICATOR CATEGORY: NATURAL RESOURCES

Indicator: Maximum trail tread incision on steep mountain bike trail segments.

Threshold: Maximum trail tread incision of no more than 3 inches at 10% of monitoring locations.

Rationale: This indicator is intended to help protect natural resources and visitor experiences. Degraded trail conditions can adversely affect water quality and vegetation through sedimentation, tramping, soil compaction, and spread of invasive plants. Trail users often avoid damaged trail surfaces by going around them, which can lead to widening of the trail surface and creation of unauthorized trails. Eroded or rutted trail surfaces affect visitor experience by creating potentially unsafe trail conditions. Degraded trail

conditions can also diminish the aesthetic quality of the trail system. This indicator would also support an increased understanding in the relationship between the amount of use (number of trail users) and impacts to resources. While no single indicator can fully capture overall trail conditions, monitoring trail tread incision at representative locations along steep trail segments provides an early indicator of potential trail degradation. Trail tread incision is indicated by a v-shaped or u-shaped trail cross section and can be caused by water draining down the middle of the trail, rather than off the side of the trail. Rutting and soil compaction also contribute to trail tread incision.

Monitoring: Monitoring changes in trail conditions allows managers to identify potential problems; take corrective action through routine preventive maintenance before substantial degradation occurs; and minimize costs of long-term trail maintenance, repair, and rehabilitation. Trail condition assessments and preventive maintenance would be conducted concurrently at least annually by NPS trail crews, park partner organizations, or a concessioner. The maximum depth of trail tread incision would be measured at several representative locations on steep mountain bike trail segments as part of the trail condition assessments.

Management Strategies and Mitigation Measures:

- Use sustainable design concepts and construction techniques to quickly eliminate water from the trail system after a rain event, which would reduce erosion, standing water, and long-term trail maintenance needs.
- Educate trail users on mountain bike trail etiquette, including not riding on wet trails, staying on the trail, riding single-file, and reporting trail damage.
- Conduct concurrent trail condition assessments and routine preventive maintenance at least annually. Increase frequency as indicated by condition assessments.
- Install physical barriers consisting of native materials to prevent trail widening and discourage use of visitor-created trails.
- Implement repair and rehabilitation projects in areas where problems persist despite routine maintenance and user education. Possible options include hardening sections of the trail surface, regrading sections to improve drainage, installing additional trail structures, and rerouting around problematic areas.

INDICATOR CATEGORY: VISITOR EXPERIENCE

Indicator: Number of mountain bike trail users per hour.

Threshold: The number of mountain bike trail users would not exceed 90% of visitor capacity for more than four consecutive hours on no more than eight days per month.

Rationale: This indicator is directly related to the desired condition that visitors have high-quality experiences in a setting that is not substantially degraded by crowding, congestion, user conflicts, or safety concerns. This EA establishes initial mountain bike trail capacities for each of the action alternatives. Measuring trail use will be necessary to determine actual use relative to capacity. When used in conjunction with other indicators, data on the number of users will help managers improve the visitor experience, protect park resources, and determine if initial trail capacity should be refined.

Monitoring: Measuring the number of users will allow managers to analyze visitor use patterns, identify relationships between trail use and other indicators, and implement management strategies. Automated trail counters would be installed during construction of the trail system at appropriate locations identified during the design process.

Management Strategies and Mitigation Measures:

- Use design concepts that minimize the potential for crowding and congestion including:
    - To improve safety and minimize conflicts between various users, a separate pedestrian trail system has been proposed under alternatives 3 and 4 while maintaining connectivity to all shared trailheads and amenities.
    - All 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 to reduce speeds, serving as a slow-down or stopping point. Amenities could include a bench, interpretive wayside panel, and/or small shade shelter for resting. Increased corridor width and adequate sightlines would be included in these intersection locations to minimize conflicts.
    - All action alternatives would include visitor education opportunities regarding appropriate use of the trail system, how to "leave no trace," and mountain biking etiquette.
- Educate visitors about observed visitor use patterns to support trip planning and manage expectations for overall level of use, parking availability, and opportunities for solitude.
- Explore options for dispersing visitors, including implementation of direction-specific user flow management (i.e., one-way, rather than two-way trails) 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.
    - Increasing trail capacity by expanding the mountain bike trail system in adjacent portions the Parkway Section 8D corridor.

Indicator: Presence of motor vehicles parked in unauthorized areas along the access road and around trailhead parking.

Threshold: Motor vehicles parked in unauthorized areas during no more than 5% of the monitoring events per month.

Rationale: Availability of parking is an important component of the visitor experience. If visitors arrive at the trailhead and cannot find a parking space, they might need to postpone or forego their planned ride. When parking lots are full, some visitors might choose to park in unauthorized areas such as road shoulders, which creates safety concerns, potential resource impacts, and diminishes aesthetics and experience for other visitors. The NPS goal is to provide right-sized parking (not too small and not too big) for the mountain bike trail system. Proposed parking lots for the action alternatives are sized primarily based on the mountain bike trail capacities, which are based on the desired visitor experience on the trails, with some allowance for use of the hiking trails (alternatives 3 and 4 only) and casual use of the trailhead as a rest area. While building an oversized parking lot would accommodate more visitors, it could result in trail capacity being exceeded, trail crowding, and diminished visitor experience. The same is true for parking in unauthorized areas. Monitoring this indicator will help ensure the desired conditions for high-quality experiences and visitor services are maintained.

Monitoring: This indicator would be monitored approximately two times per week by systematic visual inspection during peak visitation.

Management Strategies and Mitigation Measures:

- Design and build right-sized parking lots.
- Enforce parking regulations.
- Educate visitors about observed visitor use patterns to support trip planning and manage expectations for overall level of use, parking availability, and opportunities for solitude.
- Designate the parking area for mountain bike users only.
- Institute or increase parking fees.
- If parking availability and parking in unauthorized areas became a persistent problem, NPS would consider initiating planning and environmental compliance processes for:
    - Implementing a reservation system to manage visitor access and improve visitor experience.
    - Increasing parking capacity if monitoring demonstrates actual mountain bike trail use is below capacity. This could include an overflow lot that is only open under certain circumstances.

Visitor Capacity

Visitor capacity is a component of visitor use management defined as the maximum amount and types of visitor use that an area can accommodate while sustaining desired resource conditions and visitor experiences consistent with the purpose for which the area was established. NPS is legally required to identify and implement visitor capacities for all areas of a park unit per the National Parks and Recreation Act of 1978 (IVUMC 2016).

People at one time (PAOT) refers to the total number of people that are present at a site at any given point in time. Visitor capacity identification also considers the amount and types of visitor use, including the timing and distribution of visitor activities and behaviors as they relate to desired conditions. It also considers management objectives, desired conditions, and the types of management actions and strategies being considered for an area.

In the absence of well-defined standards for establishing mountain bike trail capacity, NPS relied upon best professional judgement of trail designers and experienced riders to establish visitor capacity for the proposed Wears Valley Mountain Bike Trail System. Primary factors considered in developing trail capacity included desired conditions for visitor experience, visitor safety, potential for user conflicts, design parameters such as trail width, and desired conditions for natural resources. The visitor capacity for the proposed mountain bike trail system ranges from 10 to 20 riders or PAOT per mile, with easy trails having a higher capacity than moderate and advance trails. An average of 15 PAOT per mile is used for planning and analysis purposes in the EA and would also be used for management purposes following construction. 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 for the action alternatives are: alternative 2 – 192 PAOT, alternative 3 – 177 PAOT, and alternative 4 – 128 PAOT.

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APPENDIX C: MOUNTAIN BIKE TRAIL DESIGN AND USER EXPERIENCE

Trail Design and User Experience Overview

Each of the action alternatives would provide directional trails with a "stacked loops" strategy to provide numerous ride options with shorter loops within larger loops. This design strategy would accommodate riders of all ability levels to provide a desirable experience for a wide range of visitors. The easiest trail routes would begin at the trailhead, with opportunities for shorter or longer loops. The trail system would be designed specifically for mountain bike use, although additional hiker-only routes are being considered under two alternatives. The trail system would be designed for two-way bike traffic, consistent with typical mountain bike trail design standards.

Riders may choose a 10- to 15-minute ride or a 1- to 1.5-hour ride depending on skill level. At each trail intersection, wayfinding maps would be provided with a "you are HERE icon" and a simple description of route options. Signage would also identify mileages, difficulty, recommended travel direction, and trail characteristics for various alternative turns and unique features. The planned routes would not necessarily need to be ridden in a specific direction, but trails could be adapted to be "directional" if necessary or in response to managing higher levels of use.

Adjacent trail segments within the stacked loops would typically be separated by a minimum of 40–75 linear feet and an elevation of approximately 15–40 feet to provide a visual separation between routes. Routes would be approximately 100 feet from the Great Smoky Mountains National Park boundary at Little Brier Gap and the Little Greenbrier Trail to minimize the potential for spillover into areas where bike use is not authorized, although this distance would be reduced to 50–75 feet in certain areas with limited space.

All 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. Amenities could include a bench, interpretive wayside panel, and/or small shade shelter for resting. Increased corridor width and adequate sightlines would be included in these intersection locations to minimize conflicts.

While all three action alternatives would be designed to avoid and minimize potential impacts to natural and cultural resources, limited portions of the trails would need to cross more sensitive environments, including numerous small streams and drainages in the project area. In these locations, elevated structures using galvanized steel and/or wood would be included to minimize impacts. This strategy may also be necessary to prevent concentrations of bicycle activity in areas prone to excessive moisture or mud.

Trail Difficulty Ratings

The "stacked loops" organizational layout under each action alternative would provide concentric rings of increasing technical challenge or physical difficulty as riders get farther from the trailhead access points. While this distance would be paired with increasing levels of skills requirement, the planned routes would remain readily accessible to vehicular access points for safety and accessibility. The alternatives would follow the trail difficulty standards established by the International Mountain Bike Association (IMBA), a mountain bike trail design organization. Difficulty standards are described below.

- **Easy**—Along the easy routes (<5% slope), alternate feature lines would be provided periodically offering low-risk obstacles constructed of natural materials. These features would provide opportunities for newer riders to develop introductory skills but would not be mandatory for those seeking a gentler experience. These challenge features would be considered secondary, or an alternative to the main route emphasis. Within the main route, users could expect to find gentle rolling dips, shallow berms, minimal rocky obstacles, and plenty of maneuverability space to accommodate two-way traffic, if necessary.
- **Moderate**—Moderate routes (<5% average slope/≥10% max slope) would be placed adjacent to easy routes to provide opportunities for incremental skills advancement. Designed as gateways to the advanced routes, these routes should appeal to most users. Users who prefer this intermediate level of challenge would have relatively short distances to travel beyond the trailhead starting point. Routes would travel a characteristically "more undulating" route through the existing natural topography and link unique features along the corridor. Technical features (<2 feet) would include rollers, moderate berms, small jump features, constructed (or natural) rock gardens, slow speed technical step-down drops or step-up climbing challenges (<15 inches), and short segments of steeper terrain. Technical features requiring an intermediate level of skills proficiency would include alternative "ride around" lines adjacent to the main emphasized travel route to allow users to avoid features.
- **Advanced**—Advanced routes (<10% average slope/15% or greater max slope) are proposed farther away from the trailhead access points in the steeper peripheral terrain areas of the project area. Advanced trail users would not be able to access these higher difficulty routes without having first passed through an "easy" and "moderate" gateway. Characteristic skills features may include larger (<4 feet) natural or human-constructed pumps (rollers), jumps, earthen berms, step-down rocky ledges, rocky textural obstacles, or other structures. Given the higher risk potential associated with this type of terrain, adequate fall zones would be provided with alternative ride-around lines. Although more difficult than the "moderate" level, the "advanced" level of difficulty is not the most challenging within IMBA standards.

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 by NPS and existing mutual aid agreements. 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 (provided below). These guidelines for trail behavior are recognized around the world. IMBA developed the "Rules of the Trail" to promote responsible and courteous conduct on shared-use trails. Keep in mind that conventions for yielding and passing may vary, depending on regional traditions, traffic conditions and the intended use of the trail.

IMBA Rules of the Trail

Ride On Open Trails Only. Respect trail and road closures — ask a land manager for clarification if you are uncertain about the status of a trail. Do not trespass on private land. Obtain permits or other authorization as may be required. Be aware that bicycles are not permitted in areas protected as state or federal Wilderness.

Leave No Trace. Be sensitive to the dirt beneath you. Wet and muddy trails are more vulnerable to damage than dry ones. When the trail is soft, consider other riding options. This also means staying on existing trails and not creating new ones. Don't cut switchbacks. Be sure to pack out at least as much as you pack in.

Control Your Bicycle. Inattention for even a moment could put yourself and others at risk. Obey all bicycle speed regulations and recommendations, and ride within your limits.

Yield to Others. Do your utmost to let your fellow trail users know you're coming -- a friendly greeting or bell ring are good methods. Try to anticipate other trail users as you ride around corners. Bicyclists should yield to all other trail users, unless the trail is clearly signed for bike-only travel. Bicyclists traveling downhill should yield to ones headed uphill, unless the trail is clearly signed for one-way or downhill-only traffic. Strive to make each pass a safe and courteous one.

Never Scare Animals. Animals are easily startled by an unannounced approach, a sudden movement or a loud noise. Give animals enough room and time to adjust to you. When passing horses, use special care and follow directions from the horseback riders (ask if uncertain). Running cattle and disturbing wildlife are serious offenses.

Plan Ahead. Know your equipment, your ability and the area in which you are riding -- and prepare accordingly. Strive to be self-sufficient: keep your equipment in good repair and carry necessary supplies for changes in weather or other conditions. Always wear a helmet and appropriate safety gear.

Keep trails open by setting a good example of environmentally sound and socially responsible off-road cycling.

Authorized Bicycles

As is the case for other Park trails where bicycles are authorized, use of non-motorized bicycles and Class 1 and Class 2 electric bicycles (e-bikes) would be authorized on the mountain bike trails. The use of Class 3 e-bikes would be prohibited. The definitions for e-bikes include:

Electric bicycle - means a device upon which any person may ride that is equipped with two (2) or three (3) wheels, any of which is twenty inches (20") or more in diameter, fully operable pedals for human propulsion, and an electric motor of less than seven hundred fifty (750) watts, and meets the requirements of one (1) of the three (3) classes of electric bicycles.

Class 1 electric bicycle - means an electric bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of twenty miles per hour (20 mph);

Class 2 electric bicycle - means an electric bicycle equipped with a motor that may be used exclusively to propel the bicycle, and that is not capable of providing assistance when the bicycle reaches the speed of twenty miles per hour (20 mph);

Class 3 electric bicycle - means an electric bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of twenty-eight miles per hour (28 mph).

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APPENDIX D: ISSUES AND IMPACT TOPICS DISMISSED FROM DETAILED ANALYSIS

The National Park Service (NPS) identified a range of issues and impact topics to evaluate in this environmental assessment (EA). Several issues were also eliminated from further consideration. The NPS National Environmental Policy Act (NEPA) Handbook (NPS 2015) 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.

If none of the considerations above apply to an issue, it can be dismissed from detailed analysis. Issues and impact topics dismissed from detailed analysis, including dismissal rationale, are provided below.

THREATENED, ENDANGERED, OR RARE VEGETATION

Federally listed and state-listed plant species are not expected to occur in the project area based on habitat assessment and botany surveys conducted in April and August 2020 (NPS 2020).

Rare plants may be scarce because the total population of the species may have just a few individuals, or be restricted to a narrow geographic range, or both.

Global ranks are determined by the scientific staff of NatureServe, the non-governmental organization of national, state, and provincial heritage programs. Global ranks provide the best available and objective assessment of a rare plant's rarity and the level of threat to its existence. The total number of individuals, the number of populations, and the threats to the populations are considered throughout the plant's range.

The state rank is a numeric rating of relative rarity based primarily on the number of occurrences of the plant in the state. The state and global ranks are non-legal ranks and only indicate the rarity of a species. Other factors in addition to the number of occurrences are considered when assigning rank, so the number of occurrences suggested for each numeric rank below is not a hard and fast rule (TDEC 2016). Table 1 provides the Park abundance, global rank and state rank for each rare plant in the project area.

TABLE 1. SPECIAL STATUS/RARE PLANT SPECIES WITHIN THE PROJECT AREA

Scientific Name	Common Name	Park Abundance	Global Rank	State Rank
Actaea pachypoda	White Baneberry	Common	G5	SNR
Actaea sp.	Baneberry	Unknown	N/A	N/A
Allium tricoccum	Ramps	Uncommon	G5	S1S2
Cypripedium acaule	Moccasin Flower	Uncommon	G5	S4
Cypripedium parviflorum	Lesser Yellow Lady's-Slipper	Rare	G5T3T5	SNR
Panax quinquefolius	American Ginseng	Uncommon	G3G4	S3S4
Polygonatum biflorum var. biflorum	King Solomon's Seal, Smooth Solomon's Seal	Common	N/A	N/A
Polygonatum biflorum var. commutatum	Great Solomon's Seal	Uncommon	N/A	N/A
Sanguinaria canadensis	Bloodroot	Common	G5	SNR

Sources: State and global ranking information from TDEC 2016; other information from NPS 2019a, b

SNR: Not yet ranked

S1: Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extirpation from Tennessee

S2: Very rare and imperiled within the state, six to twenty occurrences and less than 3,000 individuals, or few remaining individuals, or because of some factor(s) making it vulnerable to extirpation from Tennessee.

S3: Rare and uncommon in the state, from 21 to 100 occurrences

S4: Widespread, abundant, and apparently secure within the state, though it may be quite rare in parts of its range, especially at the periphery, and is of long-term concern.

G3: Very rare and local throughout its range or found locally in a restricted range, or, because of other factors, vulnerable to extinction throughout its range. Generally, between 21 and 100 occurrences and fewer than 10,000 individuals

G4: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery. Thus, the plant is of long-term concern

G5: Demonstrably secure globally, though it might be quite rare in parts of its range, especially at the periphery.

T#: The status of subspecies or varieties are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same numbering system above.

Common: Large numbers of individuals predictably occurring in commonly encountered habitats but not those covering a large portion of the park.

Uncommon: Few to moderate numbers of individuals; occurring either sporadically in commonly encountered habitats or in uncommon habitats.

Rare: Few individuals, usually restricted to small areas of rare habitat.

Mitigation measures under all action alternatives (see chapter 2 of the EA) would be implemented to reduce the potential for impacts on the species listed in table 1. Rare plants are located in portions of the project area that would generally be disturbed the same amount under all the action alternatives, with the exception of the baneberry occurrences, which would be disturbed to a lesser extent under alternative 4. A small number of individual plants could be lost during construction, but local populations would not be adversely affected. As a result, rare plants were dismissed from EA analysis.

LAND USE

The project area is located within the general development and transportation zones under the Park's General Management Plan (NPS 1982) and is primarily undeveloped. Existing land uses include passive recreation and haying under a special use permit. The State of Tennessee purchased the land and transferred to the US Government with the intention to develop the land as part of the Foothills Parkway (Parkway). Each of the action alternatives was designed to accommodate possible future development of Parkway Section 8D and would not conflict with the future land use. Similarly, all open field areas within the project area would either continue to be hayed or would be mowed annually to maintain the current habitat and prevent successional forest growth. Impacts on land use are not central to the proposal and do not noticeably differ across the action alternatives. As a result, land use was dismissed from detailed analysis in the EA.

WETLANDS AND FLOODPLAINS

All three action alternatives would have the same impact on both wetlands and floodplains in the project area; these impacts are detailed in appendix E. Most of the wetlands and the only floodplain are located in the northwest section of the project area adjacent to Cove Creek. Executive Orders 11988, "Floodplain Management," and 11990, "Protection of Wetlands," require NPS and other federal agencies to evaluate the likely impacts of actions in floodplains and wetlands. In accordance with these executive orders and NPS Director's Orders, a wetlands and floodplains statement of findings is included as appendix E in the EA. The statement of findings provides a detailed analysis for these resources. All three alternatives would require the same access road and bridge across Cove Creek and would have the same impacts on wetlands and floodplains. A detailed analysis of environmental impacts to wetlands and floodplains is presented in appendix E and is not repeated in chapter 3 of the EA.

AMPHIBIANS

As noted above, all three action alternatives would affect the same amount of wetland habitat and surrounding uplands. The action alternatives include a small-diameter wildlife tunnel beneath the access road in the vicinity of the wetlands adjacent to Cove Creek. Wetlands in this area are separated by the existing unpaved roadbed that is not open to motor vehicles. This roadbed was constructed in the 1980s during construction of Parkway Section 8E, so while impacts on the actual wetland would be minimal (less than 0.1 acres), the development of a road would bisect the existing wetlands and reduce connectivity/fragment the existing habitat. To minimize fragmentation and the potential for motor vehicles to strike amphibians, reptiles, and small mammals, a wildlife tunnel was included into the design as a mitigation measure and may improve connectivity between the habitat on either side of the existing roadbed. As a result, amphibians were dismissed from full analysis in the EA.

AIR QUALITY

Sevier County is in a maintenance area for the 1997 ozone standard. Construction of the mountain bike trail system and access road would require the use of heavy equipment and could temporarily affect local air quality; however, impacts from construction would be temporary and would be below the de minimis

threshold and would not trigger a General Conformity Rule Determination. Impacts on air quality are not central to the proposal, and this impact topic was dismissed from full analysis in the EA.

SOCIOECONOMICS

The actions considered in the EA could affect socioeconomics in the local area and surrounding county. Mountain bikers could increase tourism. The development of a mountain bike trail system would contribute economic beneficial impacts on the surrounding area from the increase in visitors to this section of the Park. In support of the proposed special regulation to designate a mountain bike trail system in the project area, a cost benefit analysis determined that on average each mountain biker would spend between $56.33 and $161.81 per day, per visit, depending if they were a local or non-local rider. A detailed analysis of socioeconomic benefits was not required to make a reasoned choice between alternatives, and socioeconomics was dismissed from EA analysis.

GEOLOGY (KARST TOPOGRAPHY)

Karst is a type of landscape where the dissolving of the bedrock has created sinkholes, sinking streams, caves, springs, and other characteristic features. 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).

The project area is underlain by Jonesboro limestone, and known karst features exist in the Wears Valley area. Stupkas Cave and several sinkholes are present about 0.5 miles northeast of the project area in the Section 8D corridor. No known caves or sinkholes exist within the project area,

It is possible that unidentified sinkholes that have been filled with soil exist in the project area, particularly in topographically low areas (NPS 1994). If existing, sinkholes could present constraints to the construction of the road, parking areas, buildings, and subsurface sewage disposal systems. Accordingly, a geotechnical survey would be conducted to inform the project design process and avoid and minimize potential impacts related to karst. Therefore, this resource topic was dismissed from EA analysis.

CULTURAL RESOURCES

An examination of Park records and interviews with Park staff indicated that no previously recorded cultural landscapes, historic districts, or historic structures were found within the project area. A pedestrian survey, including shovel testing, to look for any extant historic landscape features and archeological sites consistent with the National Historic Preservation Act § 800.4 was completed in July 2020. The survey determined two potentially eligible archeological sites are within the project area. The preliminary design of the mountain bike trail system and associated infrastructure was developed to avoid these potentially eligible resources. The Phase I report was submitted to the Tennessee Historical Commission, which is the state historic preservation office (SHPO). Based on findings of the archeological survey and the avoidance of potentially eligible sites, NPS has made a preliminary determination that the preferred alternative (alternative 3) would have no adverse effect on archeological resources. All consultation with the SHPO will be documented in the decision document for this EA.

Under all alternatives, if unknown archeological resources were discovered, the Park's standard protocol for inadvertent discoveries would apply. The Park's Resources Management Division would be notified immediately, and work in the immediate area would cease until a qualified archeologist evaluates the discovery. The discovery process defined by 36 Code of Federal Regulations (CFR) 800.13, the implementing regulations for the National Historic Preservation Act (16 United States Code [USC] 470),

would be applied. Evaluation of the discovery's significance would include consultation as appropriate with the SHPO, the Advisory Council on Historic Preservation, and all Tribes associated with the Park. If human remains, funerary objects, sacred objects, or objects of cultural patrimony were discovered, the process defined by 43 CFR 10.4-5, the implementing regulations of the Native American Graves Protection and Repatriation Act (25 USC 3001), would be applied.

The open field areas of the project area would continue to be mowed or hayed to maintain the pastoral setting of the project area. Because impacts on cultural resources would be avoided, this resource topic was dismissed from further consideration.

NOISE/SOUNDSCAPES

Mountain bikes do not produce any motor-sounding noises; however, e-bikes would be allowed per current NPS policy. E-bikes produce variable levels of sound but should not increase noise in the project area to a noticeable extent. Potential impacts on visitors from noise are analyzed under "Visitor Use and Experience" in the EA. Short-term noise impacts would occur during construction; however, these impacts would be temporary and would only occur during the daytime hours. Therefore, this topic was dismissed from further analysis.

WILDERNESS

The project area is designated as transportation and general park development zone in the *General Management Plan*. The area is not managed as wilderness. Therefore, this topic was dismissed from further analysis.

LIGHTSCAPES

The trail system would not include lighting, although the trailhead areas may include minimal-impact lighting techniques for security and safety purposes, consistent with similar parking areas within the Park. Any lighting would adhere to Section 4.10 – Lightscape Management of the NPS Management Policies (NPS 2006). Therefore, this topic was dismissed from further analysis.

ENERGY CONSERVATION POTENTIAL AND SUSTAINABILITY

Pursuant to NPS *Management Policies 2006* (NPS 2006), NPS would conduct its activities in ways that use energy wisely and economically. Park resources and values would not be degraded to provide energy for NPS purposes. NPS would adhere to all federal policies governing energy and water efficiency, renewable resources, use of alternative fuels, and federal fleet goals as established in the Energy Policy Act of 1992. Therefore, this topic was dismissed from further analysis.

TRAFFIC AND TRANSPORTATION

Specific access to the project area would be from a previously planned road as part of Parkway Section 8D. Users of the mountain bike trail system would not need to enter the Park through congested entrances like Gatlinburg. Some users would travel through Wears Valley to access the mountain bike trail system, which would increase vehicle trips, while other users would access it via the existing Parkway sections to the west and would not increase congestion on local roads. The trail system would create one new turning movement within an existing corridor already identified for the development of a roadway / intersection. Therefore, this topic was dismissed from further analysis.

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1982 *Final Environmental Impact Statement – General Management Plan*. Great Smoky Mountains National Park/North Carolina – Tennessee. January.

1994 *Draft Environmental Impact Statement for the Foothills Parkway, Section 8D.*

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Tennessee Department of Environment and Conservation (TDEC)

2016 *Tennessee Natural Heritage Program Rare Plant List*. https://www.tn.gov/content/dam/tn/environment/documents/na_rare-plant-list-2016.pdf

APPENDIX E: STATEMENT OF FINDINGS FOR WETLANDS AND FLOODPLAINS

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United States Department of the Interior
National Park Service
Great Smoky Mountains National Park

Wears Valley Mountain Bike Trail System

Statement of Findings for
Floodplains and Wetlands

October 2020

Recommended: _____ _____

Superintendent, Date
Great Smoky Mountains National Park

Certification of
Technical Adequacy and
Servicewide Consistency: _____ _____

Chief, Date
Water Resources Division

Approved: _____ _____

Director, Date
Region 2

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STATEMENT OF FINDINGS

INTRODUCTION

The National Park Service (NPS) is proposing to develop a mountain bike trail system in a portion of the Foothills Parkway (Parkway) in Wears Valley, Tennessee. 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.

The purpose of this combined Statement of Findings document is to comply with NPS wetland protection and floodplain management procedures. Executive Orders 11988, "Floodplain Management," and 11990, "Protection of Wetlands," require NPS and other federal agencies to evaluate the likely impacts of actions in floodplains and wetlands. NPS Director's Order #77-1: *Wetland Protection* and NPS *Procedural Manual 77-1* (NPS 2016) provide NPS policies and procedures to comply with Executive Order 11990, and NPS *Procedural Manual 77-2* (NPS 2002) provides procedures to comply with Executive Order 11988. The Draft Statement of Findings will be published and made available for public review with the environmental assessment (EA).

PROJECT DESCRIPTION

PROPOSED ACTION (PREFERRED ALTERNATIVE)

The proposed action (the preferred alternative in the EA, alternative 3) would include 11.8 miles of mountain bike trails and 2.4 miles of pedestrian-only trails in the project area. To access the trail system, 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. This access road would be approximately 24-feet wide with 4-foot shoulders and 15 feet of maintained roadside clearance on each side. A 318-foot-long bridge would be built over Cove Creek. The access road would also include a wildlife tunnel to allow amphibians, reptiles, and small mammals to continue to travel between the two wetland areas on opposite sides of the road. Additional amenities would include a trailhead with up to 145 parking spaces; possible concession/retail space; a bike wash and repair station; comfort station (restrooms); picnic tables; and an informational kiosk for orientation, trail etiquette, and rules for mountain biking. Figure 1 provides the proposed layout.

Construction

The purpose-built mountain bike trails would be approximately 4-feet wide. 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. Additional information about sustainable design concepts and construction techniques is included in the EA for this project.

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/bridge 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.

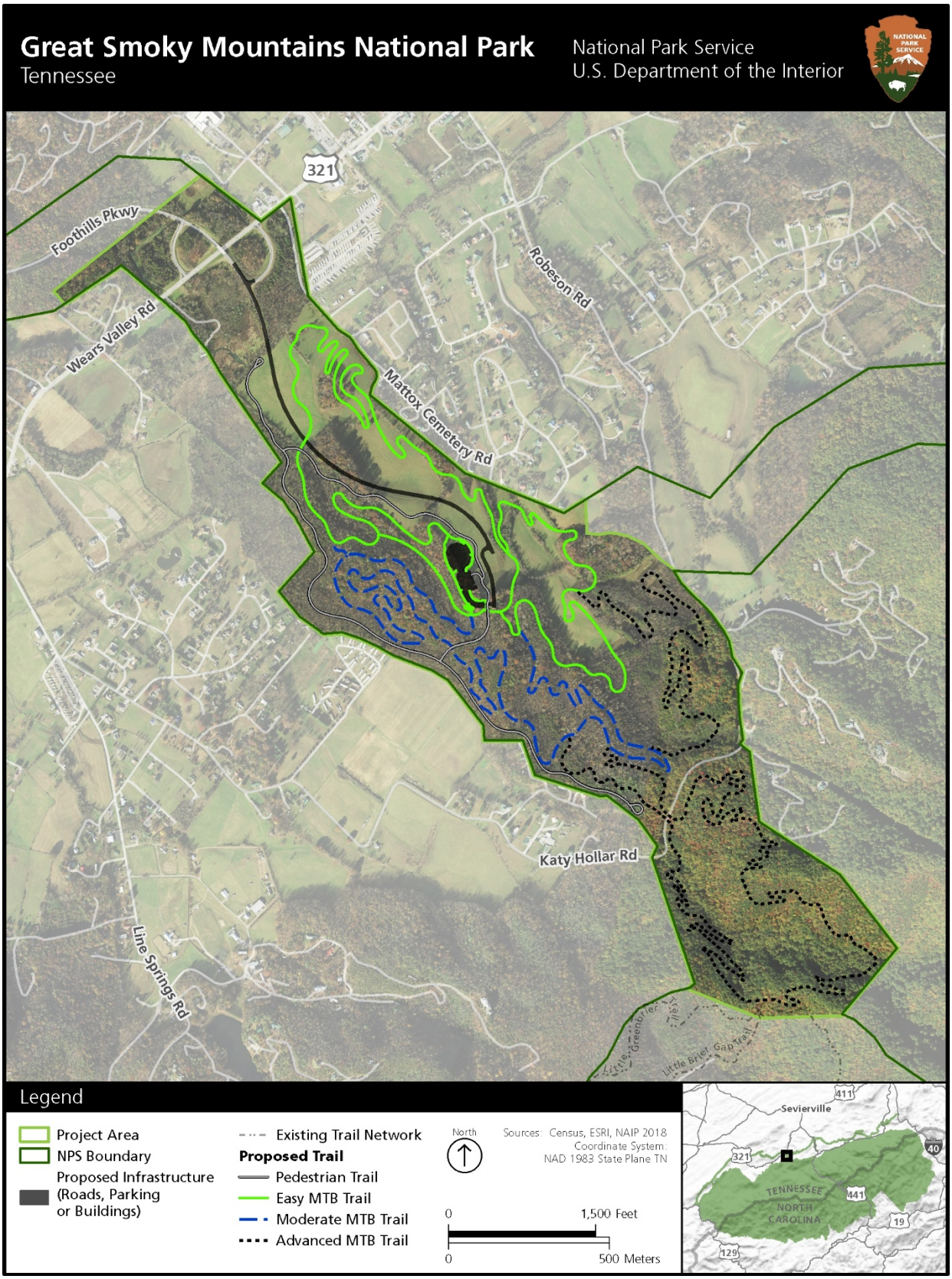

FIGURE 1. PROPOSED ACTION

Overall, the proposed action would require 25.5 acres of disturbance during the construction period. Of these 25.5 acres, 5.7 acres would be impervious surfaces for buildings, road, and parking areas and 11.9 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. An additional 0.2 acres would be for the elevated bridge. The remaining 7.7 acres would be areas disturbed by earthmoving activities during construction that would be revegetated with species in accordance with a project-specific restoration plan once construction is complete.

Because the area contains no sanitary sewer lines, a subsurface sewage disposal system (i.e., septic system) would be required at the trailhead to treat wastewater from the comfort station. The subsurface sewage disposal system would be situated near the trailhead in open, non-forested areas and outside floodplains and buffers for wetlands and streams. Based on the estimated number of bathroom stalls, the septic field would be less than 5,000 square feet, or approximately 0.11 acres. The system 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. The remaining utilities would be within the access road corridor and would require no additional ground disturbance.

SITE DESCRIPTION

The project area is located within the Foothills Parkway corridor in Wears Valley, Tennessee. The entire length of the Parkway has not been constructed, including Section 8D (approximately 9.8 miles)—the corridor from Wears Valley to the Gatlinburg Spur. The project area is located in the western portion of Section 8D. The 425-acre project area includes 67 acres of open field, 6 acres of wetlands, and 352 acres of forested habitat (see figure 2).

FIGURE 2. PHOTO OF THE PROJECT AREA

FLOODPLAINS

Executive Order 11988, "Floodplain Management," requires federal agencies to evaluate the likely impacts of actions in floodplains, avoid "adverse impacts associated with the occupancy and modification of floodplains, and avoid direct and indirect support of floodplain development wherever there is a practicable alternative." If federal actions must take place in a floodplain, the agency is required to minimize potential impacts on human, safety, health and welfare, and the risk of flood losses, and to protect and restore natural, beneficial floodplain values.

Floodplains are defined by the *Procedural Manual 77-2* as "the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, and including, at a minimum, that area subject to temporary inundation by a regulatory flood" (NPS 2002).

The project area is located within the Lower French Broad River (06010107) Hydrologic Unit Code (HUC)-8 watershed (509,776 acres). At a finer scale, the project area is within the Cove Creek subwatershed of the Waldens Creek watershed (12-digit HUC 060101070205), which flows northeast into the West Prong of the Little Pigeon River, and then flows to the French Broad River. Wears Valley is in the upper portion of the watershed with the majority of its waterways classified as headwater streams. The Federal Emergency Management Agency (FEMA) classifies 97% of the project area as Zone X. These areas have minimal flood hazard and are above the 500-year flood level (FEMA 2019). A small portion of the Cove Creek floodplain, approximately 12 acres, is included in the project area and is currently classified as Zone A (figures 2 and 4). Zone A floodplains are defined as areas with a 1% annual chance of flooding (i.e., located within the 100-year floodplain) but lack detailed analyses defining base flood elevations (FEMA 2020). However, Cove Creek can overflow its bank during localized high flow events. Floodplain values include the ability of the floodplain to absorb increased water flows, recharge groundwater, and provide floodplain habitat. Floodplain values in the project area include providing wildlife habitat for wetland and riparian species, allowing for flood storage, and facilitating conveyance.

WETLANDS

Wetland delineators conducted mapping in June 2020. Prior to conducting field surveys, the delineators performed a desktop review to determine the general location, extent, and character of potential wetlands that could occur within the project area. Wetland scientists reviewed existing maps and databases, which included aerial photography, US Geological Survey 7.5-minute topographic maps, county soil surveys (USDA-NRCS 2020a), the Web Soil Survey (USDA-NRCS 2020b), the National Wetlands Inventory (USFWS 2020), and the National Hydrography Dataset (USGS 2020). Project area wetlands were delineated through field reviews and geographic information system (GIS) analysis and then additionally assessed for function and value in the field in September 2020. Delineation procedures followed the protocols of NPS Director's Order #77-1. The classification of all waters, wetlands, and uplands were based on field observations and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). As part of the wetland delineation effort, the delineators recorded vegetative community types, inventoried dominant plant species, and described the wetlands and open waters that were delineated. Additionally, they documented soil profiles and hydrologic indicators.

Based on the field investigation, four classes of wetlands and two riverine designations were identified in the project area using the Cowardin classification system (Cowardin et al. 1979). These wetlands are listed in table 1 and comprise palustrine forested wetland (PFO), palustrine scrub-shrub wetland (PSS), palustrine emergent wetland (PEM), and palustrine unconsolidated bottom (PUB). The project area included 5,286 linear feet of ephemeral streams, 3,726 linear feet of intermittent streams, and 7,921 linear feet of perennial streams. The riverine wetlands within the project are intermittent, upper perennial, and lower perennial streams. Observed stream bed substrates include mud, cobble-gravel, and rubble.

Table 1 provides the details on the 6.80 acres of delineated wetlands, and table 2 provides the length of the riverine wetlands in the project area. Figure 3 displays the overall wetlands in the project area with detailed maps of each wetland provided in figures 4 through 9. In general, smaller wetlands are located in multiple locations across the project area with the largest wetland (4.90 acres) occurring adjacent to Cove Creek (figures 2 and 3). Qualifications of the delineators are provided at the end of this document.

TABLE 1. ACRES OF WETLANDS IN THE PROJECT AREA

Wetland Number	Cowardin Classification	Code	Acres
1	Palustrine Emergent, Persistent, Seasonally Flooded	PEM1C	4.90
2	Palustrine Forested, Broad-Leaved Deciduous, Seasonally Saturated	PFO1B	0.45
3	Palustrine Scrub-Shrub, Broad-Leaved Deciduous, Temporarily Flooded/Seasonally Flooded	PSS1A/C	0.86
4	Palustrine Emergent, Nonpersistent, Temporally Flooded/Seasonally Flooded	PEM2A/C	0.04
5	Palustrine Emergent, Persistent, Seasonally Flooded, Farmed	PEM1Bf	0.05
6	Palustrine Emergent, Persistent, Semipermanently Flooded and Palustrine Unconsolidated Bottom, Mud, Semipermanently Flooded/Permanently Flooded, Excavated	PEM1F and PUB3F/Hx	0.27
7	Palustrine Emergent, Persistent, Seasonally Flooded/Saturated and Palustrine Unconsolidated Bottom, Mud, Seasonally Flooded/Semipermanently Flooded, Excavated	PEM1E and PUB3C/Fx	0.13
8	Palustrine Emergent, Persistent, Seasonally Saturated	PEM1B	0.01
9	Palustrine Emergent, Nonpersistent, Seasonally Saturated	PEM2B	0.01
10	Palustrine Emergent, Persistent, Seasonally Flooded/Saturated and Palustrine Unconsolidated Bottom, Mud, Semipermanently Flooded/Permanently Flooded, Excavated	PEM1E and PUB3F/Hx	0.06
	Total		6.78

TABLE 2. LENGTH OF STREAMS IN THE PROJECT AREA

Stream Type	Feet	Miles
Ephemeral	5,286	1.0
Intermittent	3,726	0.7
Perennial	7,921	1.5

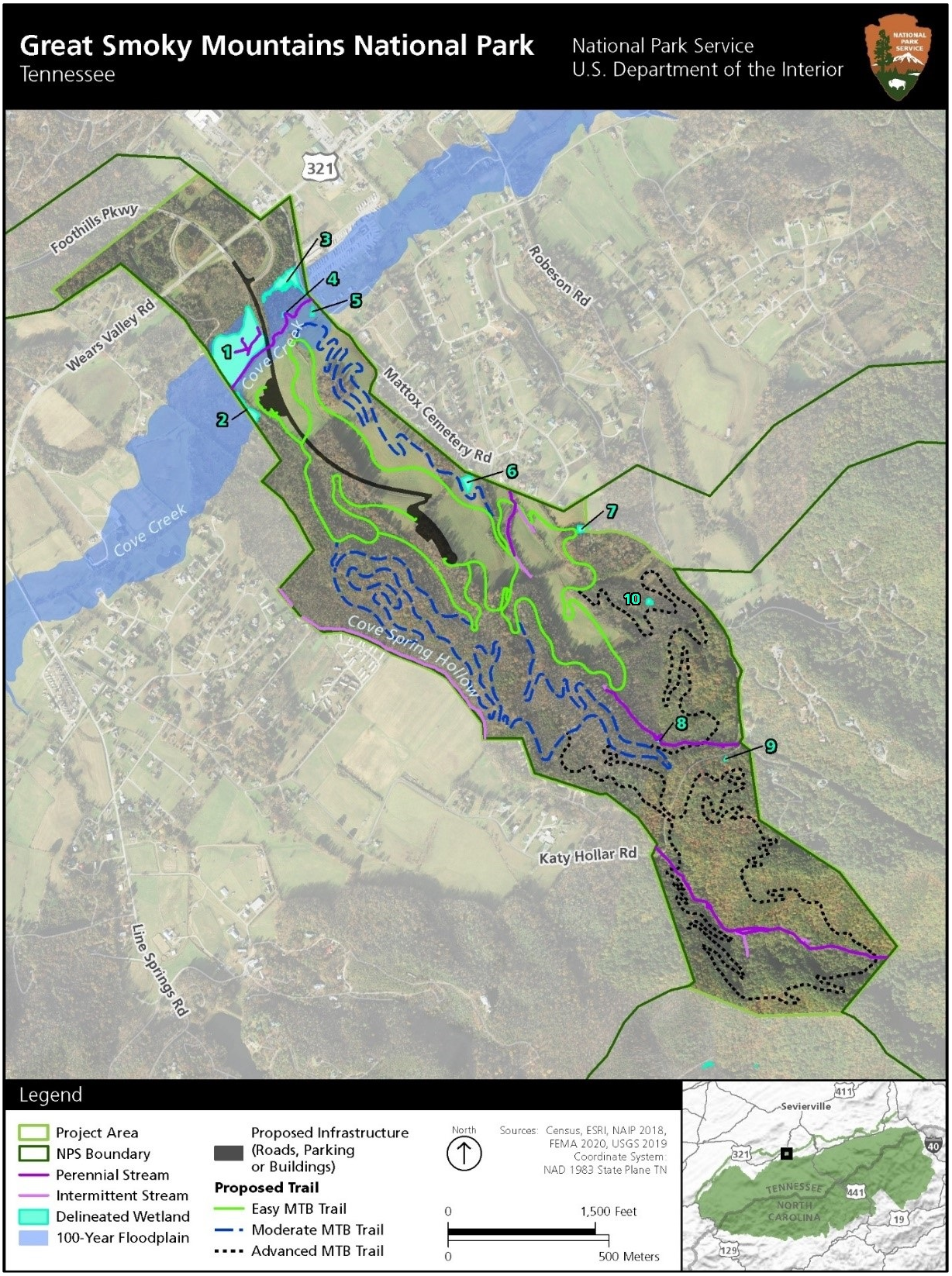

FIGURE 3. OVERVIEW OF FLOODPLAINS AND WETLANDS IN THE PROJECT AREA

Wetland 1 (PEM1C) is a seasonally flooded wetland dominated by herbaceous vegetation and adjacent to Cove Creek, a perennial stream. Dominant shrub species include common buttonbush (*Cephalanthus occidentalis*) and black willow (*Salix nigra*). Dominant herbaceous species include reed canary grass (*Phalaris arundinacea*), nodding sedge (*Carex gynandra*), and limestone wild petunia (*Ruellia strepens*). The wetland performs a variety of functions such as storing surface and subsurface water, nutrient cycling, and particulate retention; it also provides wildlife habitat and breeding habitat for amphibians. This wetland is a unique wetland in the Park because of its size, hydrology/formation, and plant composition and diversity. It provides beaver habitat as well as breeding habitat for eastern red-spotted newts (*Notophthalmus viridescens*), green frogs (*ana clamitans*), bull frogs (*Lithobates catesbeianus*), spotted salamanders (*Ambystoma maculatum*), and upland chorus frogs (*Pseudacris feriarum*). Visitors use the existing roadbed as a platform for viewing birds in this wetland.

Wetland 2 (PFO1B) is a seasonally saturated deciduous forest that directly drains to Cove Creek. Dominant plant species include red maple (*Acer rubrum*), green ash (*Fraxinus pennslyvanica*), multiflora rose (*Rosa multiflora*), Canada goldenrod (*Solidago canadensis*), and American hog peanut (*Amphicarpaea bracteate*). The wetland contributes groundwater discharge and reduces downstream particulate loading to Cove Creek, which helps to maintain stream flow and improve water quality. It also provides breeding, nesting, and feeding habitat for an assortment of wildlife.

Wetland 3 (PSS1A/C) is a temporarily to seasonally flooded scrub shrub wetland dominated by woody vegetation less than 20 feet tall. Dominant species include boxelder (*Acer negundo*), American sycamore (*Platanus occidentalis*), silver maple (*Acer saccharinum*), creeping jenny (*Lysimachia nummularia*), and swamp dock (*Rumex verticillatus*). The wetland contributes surface and groundwater discharge and reduces downstream particulate loading to Cove Creek. Other functions include storing surface and subsurface water, nutrient cycling, and particulate retention. The wetland provides wildlife habitat as well as breeding habitat for amphibians.

Wetland 4 (PEM2A/C), in the bend of Cove Creek, is a temporarily to seasonally flooded wetland dominated by herbaceous vegetation. Plant species include boxelder, chairmaker's bulrush (*Schoenoplectus americanus*), jewelweed (*Impatiens capensis*), and crowned beggarticks (*Bidens coronata*). The concave wetland helps improve the water quality of Cove Creek by retaining particulates that would otherwise enter the stream. Other wetland functions include storing surface and subsurface water and nutrient cycling. The wetland provides wildlife breeding habitat for amphibians.

Wetland 5 (PEM1Bf, figure 4), located in an old farm field, is a seasonally saturated wetland dominated by herbaceous vegetation. Dominant species include common rush (*Juncus effusus*) and fox sedge (*Carex vulpinoidea*). The wetland functions include wildlife habitat, nutrient cycling, and subsurface water storage.

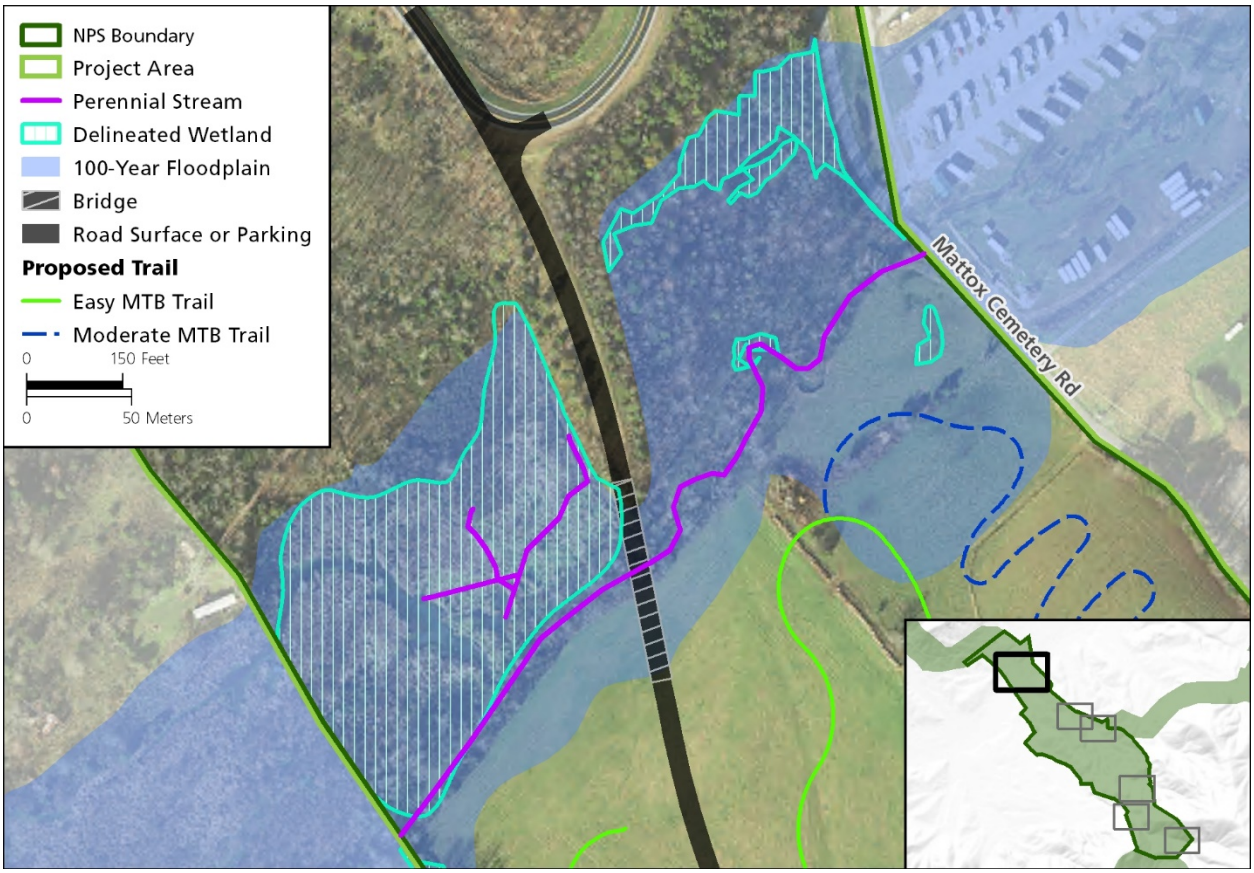

FIGURE 4. WETLANDS 1 THROUGH 5 AND STREAM CROSSING WITH ALTERNATIVES OVERLAY

Wetland 6 (PEM1F and PUB3F/Hx, figure 5) is a disused livestock pond comprising three distinct wetland habitats: unvegetated permanently flooded, sparsely vegetated semi-permanently flooded, and emergent wetland along the perimeter of the pond. Parrot feather (*Myriophyllum aquaticum*), an exotic invasive aquatic plant was observed during the delineation in the semi-permanently flooded habitat, and dead stems of parrot feather covered approximately 25% of the emergent wetland. Plant species within the emergent wetland include common rush, blunt spike rush (*Eleocharis obtusa*), and black willow (*Salix nigra*). The wetland provides wildlife habitat and breeding habitat for amphibians and aquatic invertebrates. Functions performed by the wetland include surface runoff storage, groundwater recharge, particulate retention, and nutrient cycling.

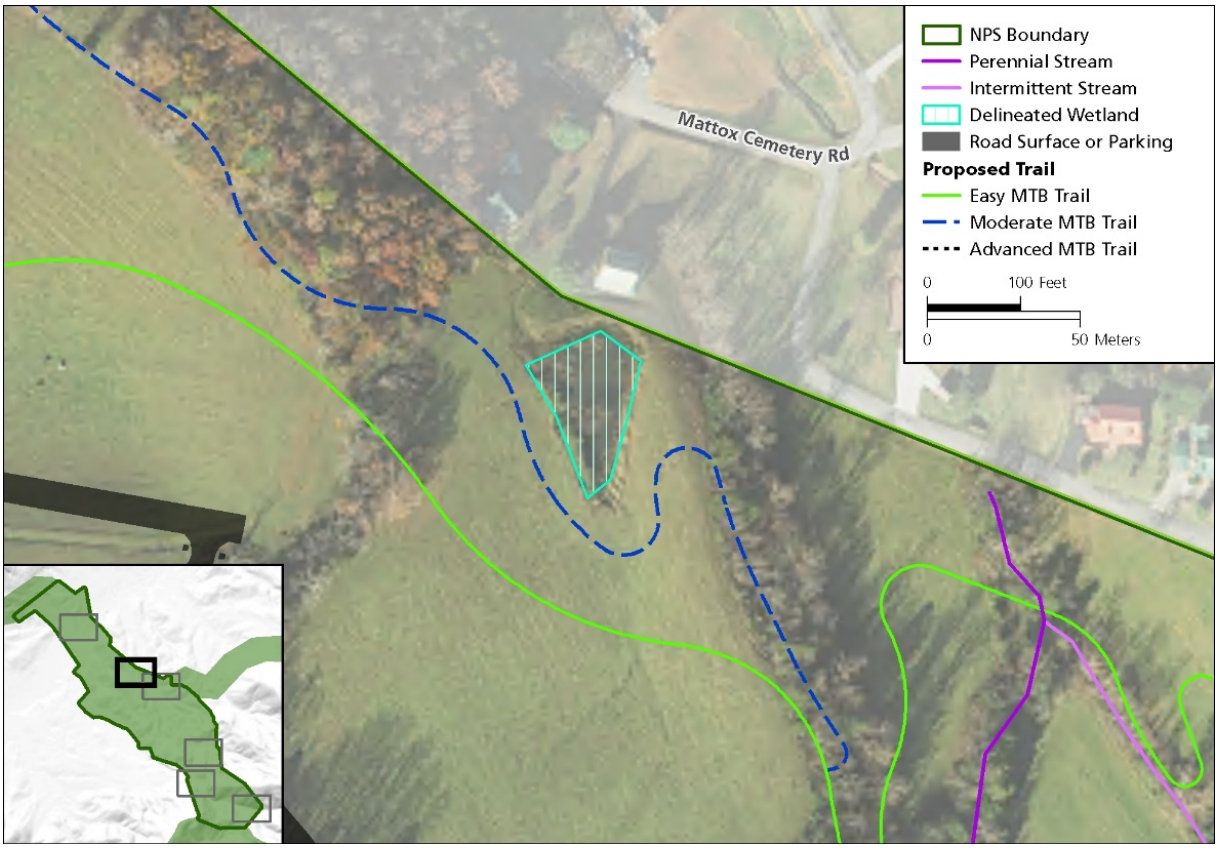

FIGURE 5. WETLAND 6 AND STREAM CROSSING WITH ALTERNATIVES OVERLAY

Wetland 7 (PEM1E and PUB3C/Fx, figure 6) is an old farm pond that is composed of sparsely vegetated to semi-permanently flooded habitats with an emergent wetland along the perimeter of the pond. The wettest areas contained sparsely vegetated concave surfaces and surface soil cracks. Plant species include common rush, Canadian clearweed (*Pilea pumila*), Pennsylvania smartweed (*Polygonum pensylvanicum*), giant ragweed (*Ambrosia trifidia*), false daisy (*Eclipta prostrata*), and bluntleaf bedstraw (*Galium obtusum*). The wetland provides wildlife habitat and breeding habitat for amphibians and aquatic invertebrates. Functions performed by the wetland include surface runoff storage, groundwater recharge, particulate retention, and nutrient cycling.

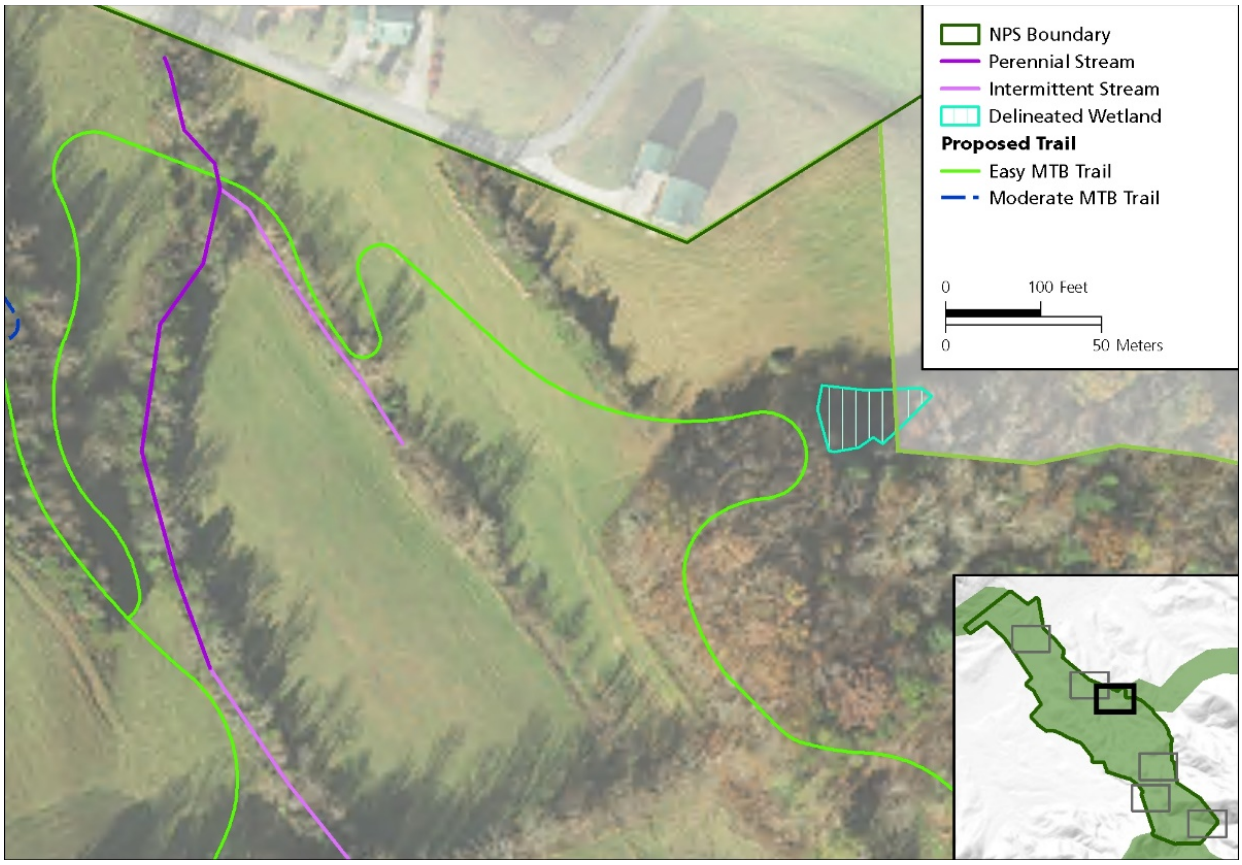

FIGURE 6. WETLAND 7 AND STREAM CROSSING WITH ALTERNATIVES OVERLAY (SAME STREAM CROSSING AS FIGURE 5)

Wetland 8 (PEM1B, figure 7) is a small point bar formed by the accumulation of alluvium in the bend of an incised perennial stream. It is a seasonal saturated wetland dominated by herbaceous vegetation with a partially closed canopy above. Plant species include jewelweed, Nepalese browntop (*Microstegium vimineum*), cutleaf coneflower (*Rudbeckia laciniata*), fowl mannagrass (*Glyceria striata*), with black gum (*Nyssa sylvatica*) and white ash (*Fraxinus Americana*) seedlings. The point bar wetland helps maintain the stream channel formation.

Wetland 9 (PEM2B, figure 7) is a seasonally saturated wetland dominated by herbaceous vegetation. Dominant plant species include wild hydrangea (*Hydrangea arborescens*), jewelweed, and Nepalese browntop. The wetland functions include wildlife habitat, nutrient cycling, and subsurface water storage.

Wetland 10 (PEM1E and PUB3F/Hx, figure 10) is an old farm pond composed of unvegetated permanently to semi-permanently flooded habitats with a seasonally flooded to saturated emergent wetland along the perimeter of the pond. Plant species include Canadian clearweed, Pennsylvania smartweed, Nepalese browntop, and Canadian woodnettle (*Laportea canadensis*). The wetland provides wildlife and breeding habitat for amphibians and aquatic invertebrates. Functions performed by the wetland include surface runoff storage, groundwater recharge, particulate retention, and nutrient cycling.

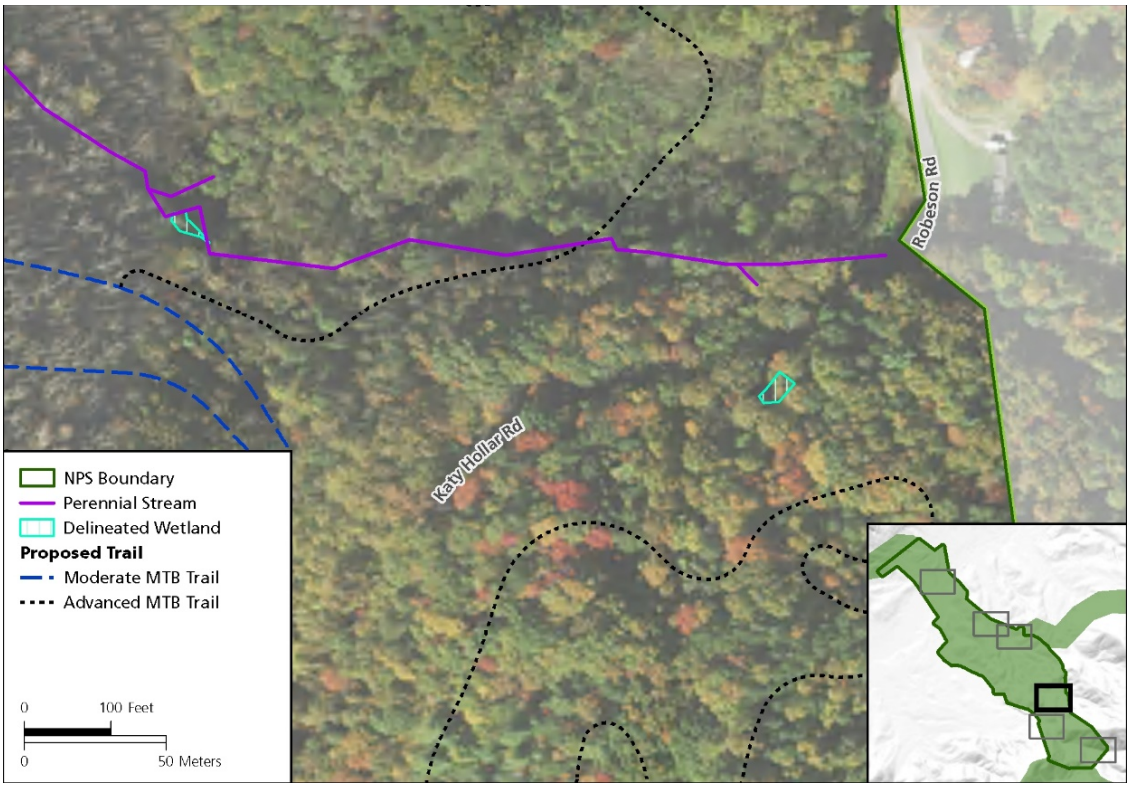

FIGURE 7. WETLANDS 8 AND 9 AND STREAM CROSSING WITH ALTERNATIVES OVERLAY

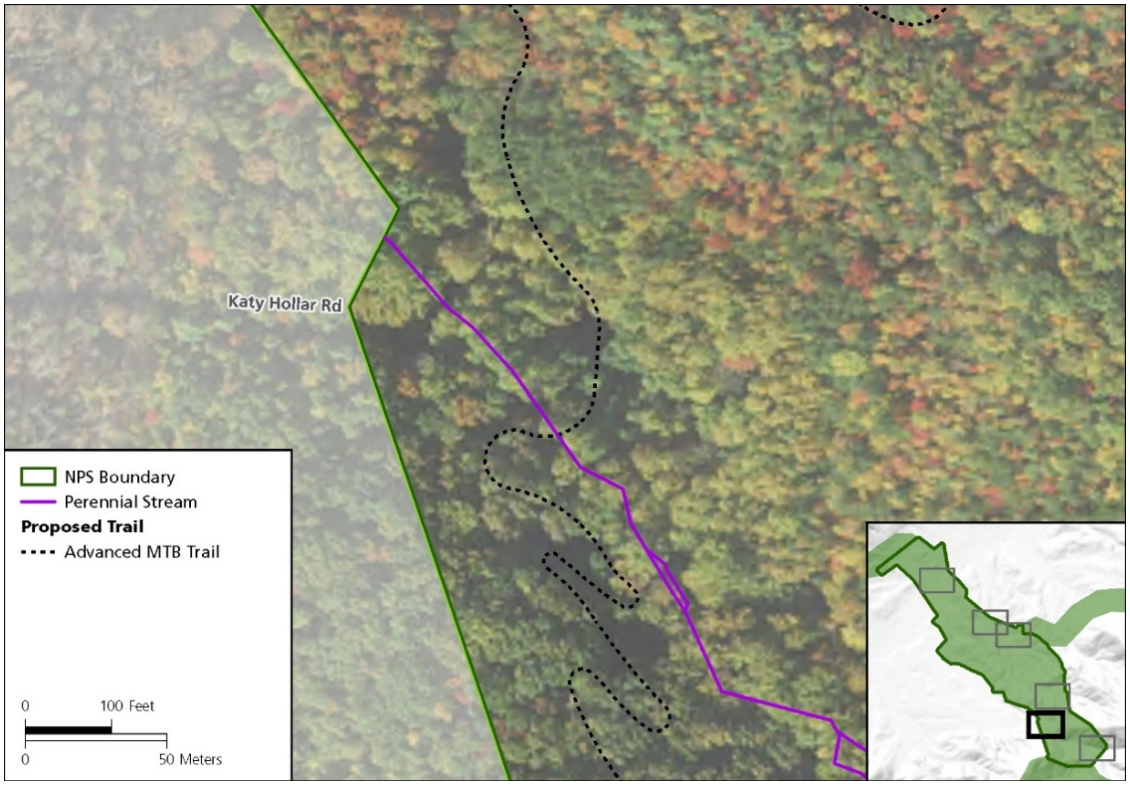

FIGURE 8. STREAM CROSSING LOCATION

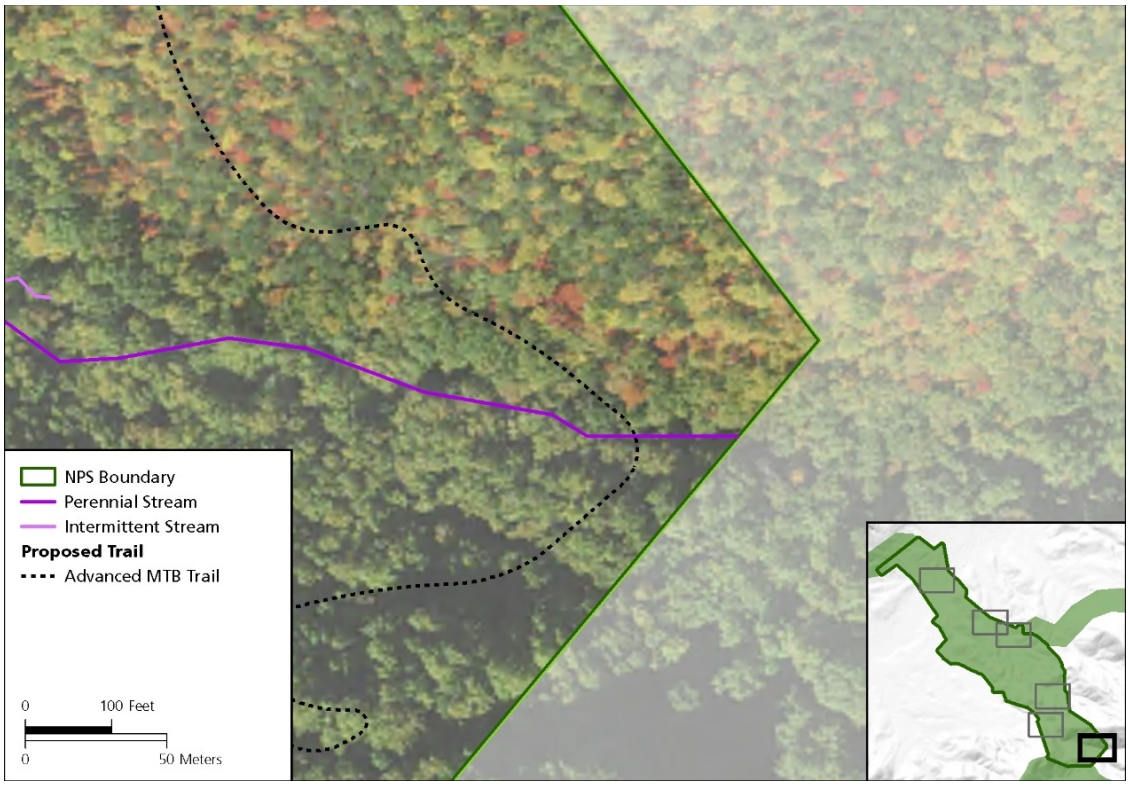

FIGURE 9. STREAM CROSSING LOCATION

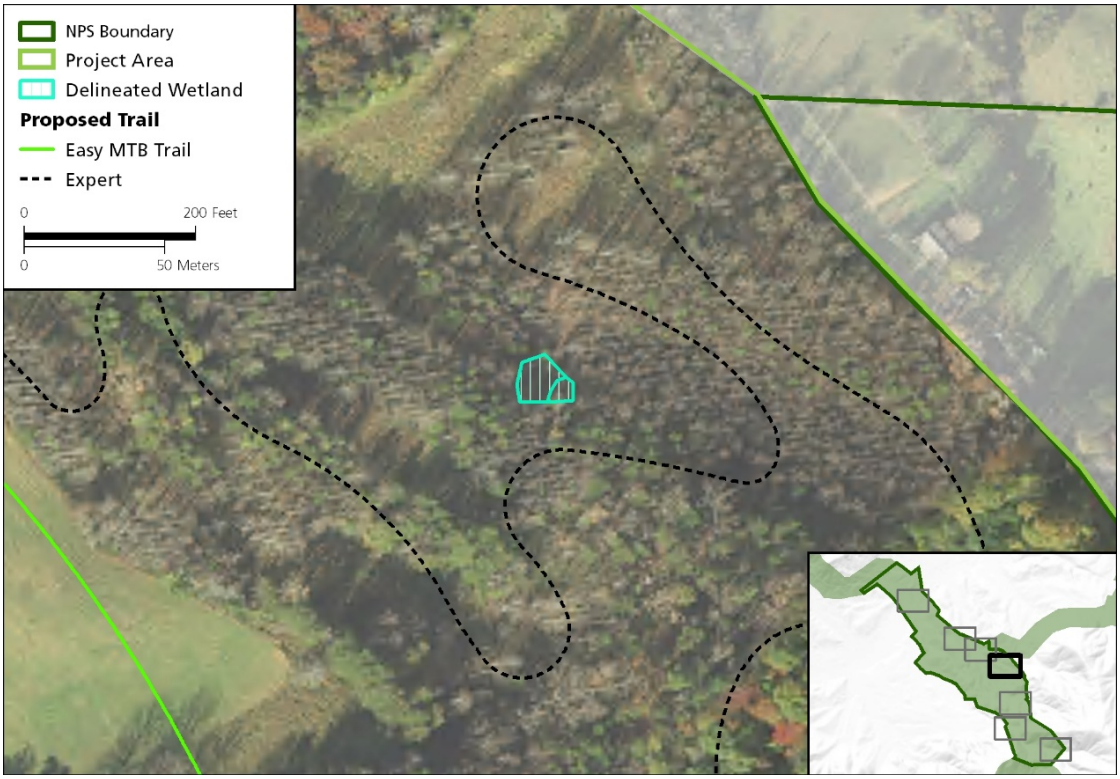

FIGURE 10. WETLAND 10 WITH ALTERNATIVES OVERLAY

JUSTIFICATION FOR THE USE OF THE FLOODPLAIN AND WETLANDS

Construction of any access road along the alignment of Section 8D is not possible without the use of floodplains and wetlands because of the narrow transportation corridor and Parkway boundary. The portion of the Section 8D roadbed that already exists was constructed in the 1980s. The alignment of Section 8D was preliminarily designed in the 1980s, and NPS completed a draft environmental impact statement with an analysis of impacts in 1994. All alternatives for this project would use the same alignment described in the 1994 draft environmental impact statement to reduce the potential for additional impacts on natural resources; NPS would not construct an additional access road outside the proposed Section 8D alignment because construction in a different location would increase the potential for impervious surface and require additional vegetation clearing. For example, access into the project area from the Metcalf Bottoms portion of the Park is not feasible without an additional 18 acres of disturbance on forested habitat to construct a 3-mile road. Access from Mattox Cemetery Road and Katy Hollar Road would require use of narrow, residential roads. Establishing access points from these roads would be inconsistent with the *Foothill Parkway Master Plan*, which identified seven specific access points along the Parkway. Additionally, there are no flat areas near the project site adjacent to Katy Hollar Road, and the road has steep grade and winding turns that are not ideal for public access points. The potential impact on floodplains and wetlands under the proposed action is justified because none of the other proposed alternatives would eliminate impacts on floodplains or wetlands. Thus, impacts on floodplains and wetlands would occur but cannot be reduced with selection of an alternative that has fewer impacts. Impacts on wetlands and floodplains would be the same across all three alternatives.

ALTERNATIVES

The EA prepared for this project considered four alternatives, including the no action alternative (alternative 1), the proposed action described above and two other action alternatives. While the type and overall length of the trail system, the location and size of trailheads, and the length of the access road varied across the action alternatives, all of the action alternatives included the development of the access road along the proposed alignment for Section 8D. As a result, every action alternative would have the same potential impacts on wetlands and floodplains.

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. Additional detail about the alternatives is included in the EA for this project.

PROJECT IMPACTS

Floodplain Impacts

Potential Risks to Human Health and Safety

The preferred alternative does not include construction of habitable structures in the floodplain. Human use of the floodplain would include motorists crossing the Cove Creek bridge and visitors using short segments (0.1 acres) of the mountain biking and hiking trails. The proposed bridge over Cove Creek would be designed to ensure it is not over-topped during the 100-year flood event. Other than the edge of the abutment on the south side of Cove Creek, the bridge would span the 100-year floodplain. Floods of potential consequence at Cove Creek are expected to occur with some warning. In general, a prolonged period of intense rain for about 12 to 24 hours could create extreme flood conditions. Gates along the Parkway would allow for closure of the area if warranted. Flood risks to human health and safety would be negligible under the preferred alternative.

Potential Risks to Property

In accordance with NPS Director's Order 77-2 and *Procedural Manual 77-2*, the construction of the proposed bridge over Cove Creek constitutes a Class I Action (location or construction of administrative, residential, warehouse, and maintenance buildings and non-excepted [overnight] parking lots, if they lie within the 100-year floodplain). Construction of trail segments in the floodplain are considered excepted actions under NPS Director's Order 77-2 and *Procedural Manual 77-2*. There are no Class II or Class III actions proposed under any of the alternatives. Specific new capital investments within the floodplain under the preferred alternative would be limited to the bridge abutment on the south side of Cove Creek. Risks to property would be minimized by following Federal Highway Administration *Design Standards for Highways in National Flood Insurance Program Mapped Floodplains* (FHWA 1986).

Potential Risks to Floodplain Values

Floodplains provide an array of natural and physical resource values within the Park, including natural flood control, erosion control, groundwater recharge, habitat for vegetation and wildlife, and recreational opportunities. Construction of the bridge across of Cove Creek would occur within and adjacent to an existing unpaved roadbed constructed in the 1980s. The surface of the existing roadbed is not in the floodplain, but the floodplain abuts the toe of the fill slope. The roadbed surface is routinely mowed, but successional forest vegetation has grown on the fill slopes. The proposed bridge would be above the floodplain, but vegetation clearing on the existing fill slope and addition of fill would be required. Using relatively steep side slopes, engineered fill, or other structural design elements for the road in this location would minimize the need to remove vegetation in the floodplain. As noted above, the bridge would be constructed above the no-rise level and would not block or alter flow.

Additionally, approximately 0.1 acres of mountain bike trails would be located within the floodplain. In this location, trail development would be limited to removing vegetation and grading a 4-foot-wide flat and permeable trail.

Habitat for vegetation and wildlife within the floodplain would be altered. While minimal habitat in the floodplain would be removed, the construction and operation of a road and bridge in this location would introduce additional noise and vehicles that could disturb wildlife. The project area is already in a developed area, so additional impacts from human presence would be minimal. The floodplain area is also used for birding, with visitors using the existing roadbed as a viewing platform. This opportunity would no longer exist with the construction of road. Birders would still be able to view the wetland from the trail on the south side of Cove Creek; however, the additional human and vehicular presence would likely degrade this experience.

As a result, the preferred alternative would not alter the floodplain functions. The bridge and trails would not alter or constrict flood waters and would not result in reduced infiltration. Increased flooding at the proposed bridge location, as a result of channel constriction, is not expected to occur because the bridge would be designed to ensure a "no-rise condition" in upstream water surface elevations. The proposed access bridge would be constructed using techniques outlined in applicable permits, including the US Army Corps of Engineers Section 404 Permit. Compliance with applicable standards, regulations, and policies to minimize impacts to floodplain resources and loss of property or human life would be strictly adhered to during and after the construction. The value of the wetland for recreation would be slightly degraded by the construction and operation of the roadway in an area currently used for birding.

Wetland Impacts

Construction of the vehicle bridge at the Cove Creek crossing would directly affect a small portion of Wetland 1. The bridge/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. Preliminary design estimates approximately 21 square feet of permanent impacts on Wetland 1 from the toe slope of

the bridge abutment. During final design, these impacts may be completely avoidable. During construction, the wetland would be clearly marked to avoid temporary impacts from earthmoving equipment associated with road and bridge development, including vegetation removal. Road construction would include a wildlife tunnel beneath the roadway to allow for continued connection between the wetlands on either side of the access road. The unavoidable, permanent impacts on the wetland totaling 21 square feet would be limited to a small corner adjacent to Cove Creek and would have negligible impacts on the function and values. The biotic and hydrologic functions would not be altered, although the current birding experience would be degraded, as noted under "Floodplain Impacts."

The six stream crossings would affect approximately 86 linear feet of riverine wetlands. In these locations, the stream crossing would avoid construction in the wetland by using elevated structures like a wooden deck ladder bridge. Assuming a 4-foot wide stream crossing, approximately 344 square feet of riverine wetlands would be shaded by the elevated structures in these locations. In an effort to minimize sediment release to surface waters in the project area, sustainable design concepts, including grade reversal and the half slope criteria, 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. In addition, trails would be designed to maintain an average 60-foot buffer away from streams and wetlands to protect wetlands in the project area from additional impacts.

MITIGATION

FLOODPLAIN RISK MITIGATION

The following floodplain risk mitigation measures would be implemented under the preferred alternative:

- Potential risks to human health and safety would be mitigated with bridge design to help ensure that the bridge and access road are above the level of a 100-year flood event. In addition, gates along the Parkway would allow for closure of the area if warranted.
- Potential risks to property would be mitigated by following Federal Highway Administration *Design Standards for Highways in National Flood Insurance Program Mapped Floodplains* (FHWA 1986).

The proposed action would incorporate the described impact avoidance and minimization techniques to protect human health/life, minimize risk to capital investment, and preserve natural and beneficial floodplain values. The proposed action would not alter flood elevations and would not have permanent effects on floodplain functions and negligible effects on floodplain values; therefore, no additional floodplain mitigation would be required.

WETLAND MITIGATION

NPS *Procedural Manual 77-1* states that wetland compensation is required if adverse impacts on wetlands from the project total 0.1 acres or more (NPS 2016). Permanent impacts on the wetland area at the proposed Cove Creek bridge would less than 0.1 acres; therefore, no compensatory mitigation is required. To provide continued accessibility for animals between the two wetland areas, the design would include construction of a wildlife tunnel under the access road on the north side of Cove Creek to allow amphibians and small mammals to cross under the road.

COMPLIANCE

In addition to Executive Orders 11988 and 11990, applicable laws and regulations pertaining to wetland and floodplain impacts include Clean Water Act Section 401 and 404 and the National Environmental Policy Act of 1969.

CONCLUSIONS

The proposed action would include activities located within the regulatory 100-year floodplain of Cove Creek, which would not alter flood elevations or have permanent effects on floodplain functions or values. Protection of human health/life would be accomplished through closure and evacuation. Therefore, it has been determined that the proposed action would be consistent with Executive Order 11988.

The proposed action would also permanently impact approximately 21 square feet of wetland edge adjacent to Cove Creek from construction of the bridge and access road. An additional 344 square feet of riverine wetlands would be impacted by shading from elevated stream crossings. Although impacts on the wetland would occur, the impact would be on the eastern edge and would not bisect the wetland. If selected for implementation, final design would strive to avoid all permanent impacts. Continued wildlife connection between the two wetlands would be facilitated by the wildlife tunnel. Wetland values for birding would be degraded. Because less than 0.1 acres of wetlands would be impacted, no compensatory mitigation is required.

QUALIFICATIONS OF THE DELINEATORS

Justin Baker, Program Manager
Professional Wetland Scientist #2682
Certified Ecologist #135983
Certified Ecological Restoration Practitioner #0064
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B.S., Environmental Science, University of North Carolina, 2000

Amanda Johnson, Project Environmental Scientist
Professional Wetland Scientist #3152
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M.N.R., North Carolina State University, 2013

Chad Hoekzema, Environmental Scientist
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Certification, Geographic Information Systems, UCLA, 2018

Susan Lindstrom, Senior Environmental Scientist
Professional Wetland Scientist #2798
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M.S., Soil and Water Science, University of Florida, 2003

Kaitlin Hughes, Senior Environmental Planner
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B.S., Environmental Science, University of Delaware, 2012

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ACRONYMS

EA	environmental assessment
FEMA	Federal Emergency Management Agency
GIS	geographic information systems
HUC	Hydrologic Unit Code
NPS	National Park Service
Park	Foothills Parkway and Great Smoky Mountains National Park
Parkway	Foothills Parkway

APPENDIX F: LIST OF BIRDS THAT MAY OCCUR IN THE PROJECT AREA

The species listed in bold have been documented as occurring in the project area, based on either: (1) project-specific point-count surveys in June 2020; or (2) multiple observations in the eBird (2020) database for the Wears Valley "hotspot."

TABLE E-1: BIRDS THAT MAY OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
Acadian flycatcher[4]	***Empidonax virescens***	**Common**	**Breeder**	**forest, water/wetlands**	**--**
alder flycatcher	*Empidonax alnorum*	Occasional	Migratory	water/wetlands	--
American bittern	*Botaurus lentiginosus*	Occasional	Migratory	water/wetlands	SC
American black duck[5]	***Anas rubripes***	**Occasional**	**Migratory**	**water/wetlands**	**--**
American coot	*Fulica americana*	Occasional	Migratory	water/wetlands	--
American Crow[4,5]	***Corvus brachyrhynchos***	**Common**	**Breeder**	**developed, grassland/pasture**	**--**
American goldfinch[4,5]	***Spinus tristis***	**Common**	**Breeder**	**developed, grassland/pasture**	**--**
American kestrel[5]	***Falco sparverius***	**Rare**	**Resident**	**developed, grassland/pasture**	**--**
American pipit[5]	***Anthus rubescens***	**Uncommon**	**Migratory**	**grassland/pasture**	**--**
American redstart	*Setophaga ruticilla*	Uncommon	Resident	forest, water/wetlands	--
American robin[4,5]	***Turdus migratorius***	**Common**	**Breeder**	**all types**	**--**
American wigeon	*Anas americana*	Occasional	Migratory	water/wetlands	--
American woodcock[5]	***Scolopax minor***	**Uncommon**	**Breeder**	**forest**	**--**
bald eagle[5]	***Haliaeetus leucocephalus***	**Uncommon**	**Resident**	**water/wetlands**	**BCC (USFWS 2008)**
bank swallow	*Riparia riparia*	Occasional	Migratory	grassland/pasture, water/wetlands	--
barn owl[5]	***Tyto alba***	**Common**	**Resident**	**all types**	**--**
barn swallow[4,5]	***Hirundo rustica***	**Common**	**Breeder**	**developed, grassland/pasture, water/wetlands**	**--**
barred owl	*Strix varia*	Uncommon	Breeder	forest, water/wetlands	--
bay-breasted warbler	*Setophaga castanea*	Uncommon	Migratory	forest, water/wetlands	--
belted kingfisher[5]	***Megaceryle alcyon***	**Uncommon**	**Breeder**	**water/wetlands**	**--**
black scoter	*Melanitta nigra*	Occasional	Vagrant	water/wetlands	--

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
black vulture[5]	***Coragyps atratus***	**Rare**	**Breeder**	**developed, grassland/pasture**	**--**
black-and-white warbler[4]	***Mniotilta varia***	**Common**	**Breeder**	**forest, water/wetlands**	**--**
black-billed cuckoo[5]	***Coccyzus erythropthalmus***	**Uncommon**	**Resident**	**forest, water/wetlands**	**BCC (USFWS 2020)**
Blackburnian warbler[5]	***Setophaga fusca***	**Common**	**Breeder**	**forest, water/wetlands**	**--**
black-capped chickadee	*Poecile atricapillus*	Common	Winter	forest, water/wetlands	BCC (USFWS 2008)
blackpoll warbler	*Setophaga striata*	Uncommon	Migratory	forest	--
black-throated blue warbler	*Setophaga caerulescens*	Common	Breeder	forest	--
black-throated green warbler[4,5]	***Setophaga virens***	**Abundant**	**Breeder**	**forest**	**--**
blue grosbeak[5]	***Passerina caerulea***	**Occasional**	**Breeder**	**developed, grassland/pasture**	**--**
blue jay[4,5]	***Cyanocitta cristata***	**Common**	**Resident**	**developed, grassland/pasture**	**--**
blue-gray gnatcatcher[4,5]	***Polioptila caerulea***	**Common**	**Breeder**	**forest**	**--**
blue-headed vireo[4,5]	***Vireo solitarius***	**Abundant**	**Breeder**	**forest**	**--**
blue-winged teal	*Anas discors*	Rare	Migratory	water/wetlands	--
blue-winged warbler	*Vermivora pinus*	Rare	Migratory	grassland/pasture, water/wetlands	BCC (USFWS 2008)
bobolink	*Dolichonyx oryzivorus*	Rare	Breeder	grassland/pasture	--
Bonaparte's Gull	*Chroicocephalus philadelphia*	Occasional	Migratory	water/wetlands	--
Brewer's blackbird	*Euphagus cyanocephalus*	Occasional	Vagrant	developed, grassland/pasture	--
broad-winged hawk[5]	***Buteo platypterus***	**Common**	**Breeder**	**all types**	**--**
brown creeper	*Certhia americana*	Common	Breeder	forest	--
brown thrasher[4,5]	***Toxostoma rufum***	**Uncommon**	**Breeder**	**developed, grassland/pasture**	**--**
brown-headed cowbird[5]	***Molothrus ater***	**Uncommon**	**Breeder**	**developed, grassland/pasture**	**--**
brown-headed nuthatch	*Sitta pusilla*	Unknown		forest	--
bufflehead[5]	***Bucephala albeola***	**Rare**	**Migratory**	**water/wetlands**	**--**
Canada goose[4,5]	***Branta canadensis***	**Uncommon**	**Breeder**	**water/wetlands**	**--**

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
Canada warbler	*Cardellina canadensis*	Common	Breeder	developed, grassland/pasture, water/wetlands	BCC (USFWS 2008, 2020)
canvasback	*Aythya valisineria*	Rare	Migratory	water/wetlands	--
Cape May warbler	*Setophaga tigrina*	Uncommon	Migratory	all types	--
Carolina chickadee[4,5]	***Poecile carolinensis***	**Common**	**Breeder**	**developed, forest, water/wetlands**	**--**
Carolina wren[4,5]	***Thryothorus ludovicianus***	**Common**	**Breeder**	**developed, forest, water/wetlands**	**--**
cedar waxwing[4,5]	***Bombycilla cedrorum***	**Uncommon**	**Breeder**	**developed, water/wetlands**	**--**
Cerulean Warbler	*Setophaga cerulea*	Rare	Breeder	forest	BCC (USFWS 2008), N
chestnut-collared longspur	*Calcarius ornatus*	Occasional	Vagrant	grassland/pasture	--
chestnut-sided warbler[4,5]	***Setophaga pensylvanica***	**Common**	**Breeder**	forest	**--**
chimney swift[5]	***Chaetura pelagica***	**Common**	**Breeder**	**developed, grassland/pasture**	**--**
chipping sparrow[5]	***Spizella passerina***	**Common**	**Breeder**	**all types**	**--**
chuck-will's-widow	*Antrostomus carolinensis*	Rare	Breeder	forest	--
cliff swallow	*Petrochelidon pyrrhonota*	Occasional	Migratory	developed, grassland/pasture	--
common goldeneye	*Bucephala clangula*	Occasional	Migratory	water/wetlands	--
common grackle[4,5]	***Quiscalus quiscula***	**Uncommon**	**Breeder**	**developed, grassland/pasture**	**--**
common loon	*Gavia immer*	Occasional	Migratory	water/wetlands	--
common merganser	*Mergus merganser*	Occasional	Breeder	water/wetlands	--
common nighthawk	*Chordeiles minor*	Rare	Migratory	developed, grassland/pasture	--
common raven[5]	***Corvus corax***	**Uncommon**	**Breeder**	**developed, grassland/pasture**	**--**
common snipe	*Gallinago gallinago*	Rare	Migrant	water/wetlands	--
common starling[4,5]	***Sturnus vulgaris***	**Rare**	**Breeder**	**developed, grassland/pasture**	**--**
common yellowthroat[5]	***Geothlypis trichas***	**Uncommon**	**Migrant**	**water/wetlands**	**--**
Connecticut Warbler	*Oporornis agilis*	Occasional	Migratory	developed, grassland/pasture, water/wetlands	--
Cooper's Hawk[5]	***Accipiter cooperii***	**Rare**	**Resident**	**developed, forest**	**--**

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
dark-eyed junco[5]	***Junco hyemalis***	**Abundant**	**Resident**	**developed, forest**	**--**
dickcissel[5]	***Spiza americana***	**Occasional**	**Migratory**	**grassland/pasture**	**--**
double-crested cormorant	*Phalacrocorax auritus*	Occasional	Migratory	water/wetlands	--
downy woodpecker[4,5]	***Picoides pubescens***	**Common**	**Resident**	**developed, forest, water/wetlands**	**--**
eastern bluebird[4,5]	***Sialia sialis***	**Uncommon**	**Breeder**	**developed, grassland/pasture**	**--**
eastern kingbird[4,5]	***Tyrannus tyrannus***	**Uncommon**	**Breeder**	**grassland/pasture, water/wetlands**	**--**
eastern meadowlark[4,5]	***Sturnella magna***	**Uncommon**	**Breeder**	**grassland/pasture**	**--**
eastern phoebe[4,5]	***Sayornis phoebe***	**Common**	**Breeder**	**forest**	**--**
eastern screech-owl[5]	***Megascops asio***	**Uncommon**	**Resident**	**forest, water/wetlands**	**--**
eastern towhee[4,5]	***Pipilo erythrophthalmus***	**Common**	**Resident**	**grassland/pasture**	**--**
eastern whip-poor-will[4,5]	***Antrostomus vociferus***	**Uncommon**	**Breeder**	**forest**	**BCC (USFWS 2008, 2020)**
eastern wood pewee[4,5]	***Contopus virens***	**Common**	**Breeder**	**forest**	**--**
evening grosbeak[5]	***Coccothraustes vespertinus***	**Occasional**	**Migrant**	**forest**	**--**
field sparrow[4,5]	***Spizella pusilla***	**Common**	**Breeder**	**grassland/pasture, water/wetlands**	**--**
fox sparrow	*Passerella iliaca*	Uncommon	Migratory	grassland/pasture, water/wetlands	--
gadwall	*Anas strepera*	Occasional	Migratory	water/wetlands	--
golden eagle	*Aquila chrysaetos*	Occasional	Migratory	grassland/pasture	N
golden-crowned kinglet[5]	***Regulus satrapa***	**Common**	**Migratory**	**forest**	**--**
golden-winged warbler	*Vermivora chrysoptera*	Rare	Breeder		BCC (USFWS 2008), ST
grasshopper sparrow	*Ammodramus savannarum*	Rare	Migratory		--
gray catbird[4,5]	***Dumetella carolinensis***	**Uncommon**	**Breeder**	**developed, grassland/pasture, water/wetlands**	**--**
great blue heron[4,5]	***Ardea herodias***	**Uncommon**	**Resident**	**water/wetlands**	**--**
great crested flycatcher[5]	***Myiarchus crinitus***	**Uncommon**	**Breeder**	**forest**	**--**
great horned owl[4,5]	***Bubo virginianus***	**Rare**	**Breeder**	**all types**	**--**

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
green heron[5]	***Butorides virescens***	**Rare**	**Breeder**	**water/wetlands**	**--**
green-winged teal	*Anas crecca*	Occasional	Migratory	water/wetlands	--
grey-cheeked thrush	*Catharus minimus*	Uncommon	Migratory		--
hairy woodpecker[4,5]	***Picoides villosus***	**Common**	**Resident**	**developed, forest, water/wetlands**	**--**
harlequin duck	*Histrionicus histrionicus*	Occasional	Vagrant	water/wetlands	--
Henslow's sparrow	*Ammodramus henslowii*	Occasional	Migratory		BCC (USFWS 2008), ST
hermit thrush[5]	***Catharus guttatus***	**Uncommon**	**Migratory**	**developed, forest, water/wetlands**	**--**
herring gull	*Larus argentatis*	Occasional	Vagrant		--
hooded merganser	*Lophodytes cucullatus*	Rare	Migratory	water/wetlands	--
hooded warbler[5]	***Setophaga citrina***	**Common**	**Breeder**	**forest**	**--**
horned lark	*Eremophila alpestris*	Occasional	Migratory		--
house finch[4,5]	***Carpodacus mexicanus***	**Rare**	**Resident**	**developed, grassland/pasture**	**--**
house sparrow	*Passer domesticus*	Rare	Resident		--
house wren[4,5]	***Troglodytes aedon***	**Rare**	**Breeder**	**developed, grassland/pasture, water/wetlands**	**--**
indigo bunting[4,5]	***Passerina cyanea***	**Common**	**Breeder**	**grassland/pasture, water/wetlands**	**--**
Kentucky Warbler	*Geothlypis formosa*	Uncommon	Breeder		BCC (USFWS 2008, 2020)
killdeer[4,5]	***Charadrius vociferus***	**Uncommon**	**Resident**	**developed, grassland/pasture**	**--**
Lapland Longspur	*Calcarius lapponicus*	Occasional	Vagrant		--
Le Conte's sparrow	*Ammodramus leconteii*	Occasional	Migratory		--
least flycatcher	*Empidonax minimus*	Uncommon	Breeder		--
least sandpiper	*Calidris minutilla*	Occasional	Migratory	water/wetlands	--
lesser scaup	*Aythya affinis*	Occasional	Migratory	water/wetlands	--
Lincoln's Sparrow	*Melospiza lincolnii*	Rare	Migratory		--
little blue heron	*Egretta caerulea*	Occasional	Migratory		--
loggerhead shrike	*Lanius ludovicianus*	Occasional	Migratory		BCC (USFWS 2008), N

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
long-eared owl	*Asio otus*	Occasional	Migratory		--
Louisiana waterthrush[4,5]	***Parkesia motacilla***	**Common**	**Breeder**	**water/wetlands**	**BCC (USFWS 2008)**
magnolia warbler[5]	***Setophaga magnolia***	**Common**	**Migratory**	**forest**	**--**
mallard[5]	***Anas platyrhynchos***	**Uncommon**	**Breeder**	**water/wetlands**	**--**
marsh wren[5]	***Cistothorus palustris***	**Occasional**	**Migratory**	**water/wetlands**	**--**
merlin[5]	***Falco columbarius***	**Occasional**	**Migratory**	**grassland/pasture, water/wetlands**	**--**
Mississippi kite	*Ictinia mississippiensis*	Occasional	Migratory		--
mourning dove[4,5]	***Zenaida macroura***	**Common**	**Resident**	**developed, grassland/pasture, water/wetlands**	**--**
mourning warbler	*Geothlypis philadelphia*	Occasional	Migratory		--
Nashville Warbler	*Leiothlypis ruficapilla*	Uncommon	Migratory		--
northern bobwhite	*Colinus virginianus*	Rare	Breeder		--
northern cardinal[4,5]	***Cardinalis cardinalis***	**Common**	**Breeder**	**developed, grassland/pasture, water/wetlands**	**--**
northern flicker[4,5]	***Colaptes auratus***	**Uncommon**	**Breeder**	**developed, grassland/pasture, water/wetlands**	**--**
northern goshawk	*Accipiter gentilis*	Occasional	Vagrant		--
northern harrier	*Circus cyaneus*	Uncommon	Migratory		--
northern mockingbird[5]	***Mimus polyglottos***	**Rare**	**Resident**	**developed, grassland/pasture, water/wetlands**	**--**
northern oriole	*Icterus galbula*	Uncommon	Migratory		--
northern parula[4,5]	***Setophaga americana***	**Common**	**Breeder**	**forest, water/wetlands**	**--**
northern pintail	*Anas acuta*	Occasional	Migratory	water/wetlands	--
northern rough-winged swallow[4,5]	***Stelgidopteryx serripennis***	**Uncommon**	**Breeder**	**grassland/pasture, water/wetlands**	**--**
northern saw-whet owl	*Aegolius acadicus*	Uncommon	Winter		BCC (USFWS 2008)
northern waterthrush	*Parkesia noveboracensis*	Rare	Migratory		--
olive-sided flycatcher	*Contopus cooperi*	Rare	Migratory		BCC (USFWS 2008)
orange-crowned warbler	*Vermivora celata*	Occasional	Migratory		--

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
orchard oriole[5]	***Icterus spurius***	**Rare**	**Migratory**	**all types**	**--**
osprey	*Pandion haliaetus*	Rare	Migratory	water/wetlands	--
ovenbird[4,5]	***Seiurus aurocapilla***	**Abundant**	**Breeder**	**forest**	**--**
palm warbler[5]	***Setophaga palmarum***	**Uncommon**	**Migratory**	**grassland/pasture**	**--**
peregrine falcon	*Falco peregrinus*	Uncommon	Migratory	developed, grassland/pasture, water/wetlands	BCC (USFWS 2008)
Philadelphia vireo	*Vireo philadelphicus*	Occasional	Migratory		--
pied-billed grebe	*Podilymbus podiceps*	Rare	Migratory		--
pileated woodpecker[4,5]	***Dryocopus pileatus***	**Uncommon**	**Resident**	**forest**	**--**
pine siskin	*Spinus pinus*	Common	Winter		--
pine warbler[4,5]	***Setophaga pinus***	**Uncommon**	**Breeder**	**forest**	**--**
prairie warbler	*Setophaga discolor*	Uncommon	Breeder		BCC (USFWS 2008)
purple finch[5]	***Carpodacus purpureus***	**Uncommon**	**Migratory**	**forest, water/wetlands**	**--**
purple martin	*Progne subis*	Rare	Migratory		--
red crossbill	*Loxia curvirostra*	Uncommon	Migratory		BCC (USFWS 2008)
red phalarope	*Phalaropus fulicarius*	Unknown	Vagrant	water/wetlands	--
red-bellied woodpecker[4,5]	***Melanerpes carolinus***	**Uncommon**	**Breeder**	**forest, water/wetlands**	**--**
red-breasted nuthatch	*Sitta canadensis*	Common	Migratory	forest	--
red-eyed vireo[4,5]	***Vireo olivaceus***	**Abundant**	**Breeder**	**forest, water/wetlands**	**--**
redhead	*Aythya americana*	Occasional	Migratory	water/wetlands	--
red-headed woodpecker[4,5]	***Melanerpes erythrocephalus***	**Rare**	**Breeder**	**developed, grassland/pasture**	**BCC (USFWS 2008, 2020)**
red-necked phalarope	*Phalaropus lobatus*	Occasional	Vagrant	water/wetlands	--
red-shouldered hawk[4,5]	***Buteo lineatus***	**Uncommon**	**Breeder**	**forest, water/wetlands**	**--**
red-tailed hawk[4,5]	***Buteo jamaicensis***	**Uncommon**	**Resident**	**developed, grassland/pasture**	**--**
red-winged blackbird[4,5]	***Agelaius phoeniceus***	**Uncommon**	**Breeder**	**water/wetlands**	**--**
ring-billed gull	*Larus delawarensis*	Occasional	Migratory		--
ring-necked duck	*Aythya collaris*	Rare	Migratory	water/wetlands	--

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
rock dove[5]	***Columba livia***	**Occasional**	**Migratory**	**developed, grassland/pasture**	**--**
rose-breasted grosbeak[4]	***Pheucticus ludovicianus***	**Common**	**Breeder**	**forest**	**--**
Ross's Goose	*Chen rossii*	Rare	Vagrant		--
ruby-crowned kinglet[5]	***Regulus calendula***	**Uncommon**	**Migratory**	**forest**	**--**
ruby-throated hummingbird[5]	***Archilochus colubris***	**Common**	**Breeder**	**developed, grassland/pasture**	**--**
ruddy duck	*Oxyura jamaicensis*	Occasional	Migratory	water/wetlands	--
ruffed grouse[4]	***Bonasa umbellus***	**Uncommon**	**Breeder**	**forest**	**--**
rusty blackbird	*Euphagus carolinus*	Rare	Migratory		BCC (USFW 2008)
sandhill crane	*Grus canadensis*	Rare	Vagrant	grassland/pasture, water/wetlands	--
savannah sparrow[5]	***Passerculus sandwichensis***	**Rare**	**Migratory**	**grassland/pasture, water/wetlands**	**--**
scarlet tanager[4,5]	***Piranga olivacea***	**Common**	**Breeder**	**forest**	**--**
scissor-tailed flycatcher	*Tyrannus forficatus*	Occasional	Migratory		--
sedge wren	*Cistothorus platensis*	Occasional	Migratory		BCC (USFWS 2008)
semipalmated plover	*Charadrius semipalmatus*	Occasional	Migratory		--
sharp-shinned hawk[5]	***Accipiter striatus***	**Uncommon**	**Resident**	**forest**	**--**
short-billed dowitcher	*Limnodromus griseus*	Occasional	Migratory	water/wetlands	--
short-eared owl	*Asio flammeus*	Occasional	Migratory		--
snow bunting	*Plectrophenax nivalis*	Occasional	Vagrant		--
snow goose	*Chen caerulescens*	Occasional	Migratory		--
solitary sandpiper	*Tringa solitaria*	Rare	Migratory		--
song sparrow[4,5]	***Melospiza melodia***	**Common**	**Breeder**	**developed, grassland/pasture, water/wetlands**	**--**
sora	*Porzana carolina*	Occasional	Migratory		--
spotted sandpiper	*Actitis macularia*	Rare	Migratory		--
summer tanager[5]	***Piranga rubra***	**Rare**	**Breeder**	**forest**	**--**
Swainson's Thrush	*Catharus ustulatus*	Common	Migratory		--

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
Swainson's warbler[4]	***Limnothlypis swainsonii***	**Rare**	**Breeder**	**forest, water/wetlands**	**BCC (USFWS 2008), N**
swallow-tailed kite	*Elanoides forficatus*	Unknown	Vagrant		--
swamp sparrow[5]	***Melospiza georgiana***	**Uncommon**	**Migratory**	**water/wetlands**	**--**
Tennessee Warbler	*Leiothlypis peregrina*	Common	Migratory		--
tree swallow[4,5]	***Tachycineta bicolor***	**Rare**	**Breeder**	**pasture/grassland, water/wetlands**	**--**
tufted titmouse[4,5]	***Baeolophus bicolor***	**Common**	**Breeder**	**forest**	**--**
turkey vulture[5]	***Cathartes aura***	**Common**	**Breeder**	**all types**	**--**
veery	*Catharus fuscescens*	Common	Breeder		--
vesper sparrow	*Pooecetes gramineus*	Uncommon	Breeder		--
Virginia Rail[5]	***Rallus limicola***	**Rare**	**Migratory**	**water/wetlands**	**--**
warbling vireo[4,5]	***Vireo gilvus***	**Occasional**	**Migratory**	**developed, forest**	**--**
white-breasted nuthatch[4,5]	***Sitta carolinensis***	**Common**	**Breeder**	**forest**	**--**
white-crowned sparrow[5]	***Zonotrichia leucophrys***	**Rare**	**Migratory**	**developed, forest**	**--**
white-eyed vireo[4,5]	***Vireo griseus***	**Uncommon**	**Breeder**	**pasture/grassland**	**--**
white-throated sparrow[5]	***Zonotrichia albicollis***	**Common**	**Migratory**	**developed, forest**	**--**
white-winged scoter	*Melanitta fusca*	Occasional	Vagrant		--
wild turkey[5]	***Meleagris gallopavo***	**Uncommon**	**Breeder**	**forest, grassland/pasture**	**--**
willow flycatcher[5]	***Empidonax traillii***	**Occasional**	**Breeder**	**forest, water/wetlands**	**--**
Wilson's Snipe	*Gallinago delicata*	Rare	Resident		--
Wilson's Warbler	*Cardellina pusilla*	Occasional	Migratory		--
winter wren[5]	***Troglodytes troglodytes***	**Common**	**Breeder**	**forest**	**--**
wood duck[5]	***Aix sponsa***	**Uncommon**	**Breeder**	**water/wetlands**	**--**
wood thrush[4,5]	***Hylocichla mustelina***	**Common**	**Breeder**	**forest**	**BCC (USFWS 2008, 2020), N**
worm-eating warbler[4]	***Helmitheros vermivorus***	**Common**	**Breeder**	**forest**	**BCC (USFWS 2008)**
yellow warbler	*Setophaga petechia*	Uncommon	Breeder		--

Common Name	Scientific Name	Abundance[1]	Occurrence[2]	Preferred Habitat Type(s)	Special Status[3]
yellow-bellied sapsucker[5]	***Sphyrapicus varius***	**Uncommon**	**Breeder**	**forest**	**BCC (USFWS 2008, 2020)**
yellow-billed cuckoo[4,5]	***Coccyzus americanus***	**Uncommon**	**Breeder**	**forest, water/wetlands**	**--**
yellow-breasted chat[4,5]	***Icteria virens***	**Uncommon**	**Breeder**	**forest, water/wetlands**	**--**
yellow-crowned night-heron	*Nyctanassa violacea*	Occasional	Breeder		--
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	Occasional	Vagrant		--
yellow-rumped warbler[5]	***Setophaga coronata***	**Common**	**Migratory**	**forest**	**--**
yellow-throated vireo	*Vireo flavifrons*	Common	Breeder		--
yellow-throated warbler[4]	***Setophaga dominica***	**Uncommon**	**Breeder**	**forest**	**--**

Sources: June 2020 Point-count surveys; USFWS (2008, 2020); NPS (2019, 2020); eBird (2020)

[1] **Abundant**: May be seen daily, in suitable habitat and season, and counted in relatively large numbers.
Common: May be seen daily, in suitable habitat and season, but not in large numbers.
Uncommon: Likely to be seen monthly in appropriate habitat and season. May be locally common.
Occasional: Occurs in the project area at least once every few years, varying in numbers, but not necessarily every year.
Rare: Present, but usually seen only a few times each year.

[1] **Breeder**: Population reproduces in the project area.
Resident: A population is maintained in the project area, but it is not known to breed there.
Migratory: Species occurs in the project area only while in transition between breeding and wintering grounds.
Winter: Typically spending only winter months in the project area.
Vagrant: Project area is outside of species' usual range.

[3] **BCC**=USFWS-designated Bird of Conservation Concern, according to USFWS (2008 or 2020).
SC=USFWS-designated "Species of concern," which is an informal term that refers to those species that may require some conservation actions but are not threatened with extinction.
ST=listed as state threatened under T.A.C. § 1660-01-32-.02.
N=listed as state wildlife in need of management under T.A.C. § 1660-01-32-.03

[4] Observed in the project area during point-count surveys of the project area

[5] Observed in Wears Valley according to eBird (2020)

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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 U.S. administration.

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