

Great Smoky Mountains National Park

U.S. Department of the Interior
National Park Service



Wears Valley Mountain Bike Trail System Revised Environmental Assessment Appendices



February 2022

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 Policies 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.

References

Interagency Visitor Use Management Council (IVUMC)

- 2016 *Visitor Use Management Framework: A Guide to Providing Sustainable Outdoor Recreation*. Accessed September 2, 2020.
https://visitorusemanagement.nps.gov/Content/documents/lowres_VUM%20Framework_Edition%201_IVUMC.pdf

National Park Service, US Department of the Interior (NPS)

- 1982 *Final Environmental Impact Statement – General Management Plan*. Great Smoky Mountains National Park/North Carolina – Tennessee. January.
- 2006 *Management Policies*. US Department of the Interior, National Park Service, Washington, DC. https://www.nps.gov/policy/MP_2006.pdf
- 2016 *Foundation Document. Great Smoky Mountains National Park, North Carolina and Tennessee*. US Department of the Interior, National Park Service. October.

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: PUBLIC COMMENT RESPONSE REPORT – OCTOBER 2020 EA

Introduction

Great Smoky Mountains National Park (the Park) initiated a 30-day public comment period for the Wears Valley Mountain Bike Trail System Environmental Assessment (EA) on October 16, 2020. The information obtained during this public comment period was reviewed, and the National Park Service (NPS) responded to substantive comments.

During this time, one virtual public meeting was held over Zoom on October 29, 2020. The public was encouraged to submit comments through NPS's Planning, Environment, and Public Comment (PEPC) website (<https://parkplanning.nps.gov/WearsValleyBikeTrails>). Comments were also accepted by US mail and email. A total of 22 pieces of correspondence were received during the comment period. This report describes how NPS considered the public comments and provides the responses to substantive comments, which are grouped together by area of concern.

PUBLIC OUTREACH DURING THE OCTOBER 2020 EA COMMENT PERIOD

NPS issued a press release on October 16, 2020, announcing the availability of the EA. A letter was sent to adjacent property owners announcing the availability of the EA for public review. NPS also sent the press release to more than 200 interested individuals and organizations notifying them of the opportunity to comment. On that date, the NPS PEPC website (<http://parkplanning.nps.gov/WearsValleyBikeTrails>) was opened for the public to submit comments. Due to the COVID-19 pandemic, no in-person public meetings were held. One virtual public meeting was held over Zoom on October 29, 2020, during which the public was encouraged to ask questions over a live question-and-answer platform following an overview presentation about the EA. Nineteen people attended the virtual meeting.

DEFINITION OF TERMS

Primary terms used in the document are defined below.

Correspondence: A correspondence is the entire document received from commenters and includes letters, written comment forms, comments entered directly into PEPC, and any other written comments provided by US mail or in person at the park.

Comment: A comment is a portion of the text within a correspondence that addresses a single subject. It could include such information as an expression of support or opposition for an alternative, additional data regarding the existing condition, or suggestions for resource topics to be considered.

Code: A code is a grouping centered on a common subject. The codes were developed during the comment analysis process and are used to track major issues.

Concern: Concerns are statements that summarize the comments under each code. Some codes required multiple concern statements, while others did not.

Substantive Comments: The NPS National Environmental Policy Act (NEPA) Handbook defines substantive comments as those that:

- question, with reasonable basis, the accuracy of the information in the NEPA document;
- question, with reasonable basis, the adequacy of the environmental analysis;
- present reasonable alternatives other than those presented in the NEPA document; or
- cause changes or revisions in the proposal.

In other words, substantive comments raise, debate, or question a point of fact or analysis. Comments that merely support or oppose a proposal or that merely agree or disagree with NPS policy are not considered substantive and do not require a formal response” (NPS 2015).

Comment Analysis Methodology

All correspondence was received directly through the PEPC system. Each correspondence was read, and specific comments within each unique correspondence were identified. When identifying comments, every attempt was made to capture the full breadth of comments submitted.

To categorize comments, each comment was given a code to identify its general content and to group similar comments. Eight codes were used to categorize the public comments received. An example of a code developed for this project is *IS5000 – Issues: Wildlife*. Once every correspondence was broken into comments, all comments were categorized into concern statements or summarized with similar comments.

Concern Response Report

This report summarizes the comments received during the public comment period. Tables 1 through 8 provide concise lists of concern statements by code.

TABLE 1. AE1000 – ALTERNATIVES AND ELEMENTS – TRAILS/AMENITIES

<p>Concern ID 1: One commenter expressed concern that visitor amenities included in the proposed action would not be adequate given the anticipated high use of the mountain bike trail.</p>
<p>NPS Response: Trail design and capacity are based on available space at the Wears Valley site and the Park’s desire to build a sustainable mountain bike trail system that provides a high-quality visitor experience. Amenities such as trailhead parking and restrooms are intended to accommodate the trail capacity stated in the EA. The visitor use management information provided in appendix B of the EA outlines how NPS would manage visitor use to achieve desired conditions and help ensure that use does not exceed visitor capacity.</p>

TABLE 2. AL3000 – ALTERNATIVE 3- SUBSTANTIVE

<p>Concern ID 2: One commenter stated that alternative 3 would not best achieve the desired conditions for natural resources and Park operations.</p>
<p>NPS Response: As noted in appendix B of the EA, desired conditions are aspirational statements that articulate what areas of the Park would look, feel, sound, and function like in the future. <i>NPS Management Policies</i> 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. Appendix B provides management strategies, indicators, and thresholds the Park would use to manage</p>

visitor use and ideally achieve desired conditions under all of the action alternatives, including alternative 3.

National Park Service, US Department of the Interior (NPS)

2006 *Management Policies*. US Department of the Interior, National Park Service, Washington, DC. https://www.nps.gov/policy/MP_2006.pdf

TABLE 3. IS2000 – ISSUES: WATER RESOURCES

Concern ID 3: One commenter expressed concern that NPS has not yet applied for applicable permits from regulatory agencies.

NPS Response: It would be inappropriate for NPS to apply for permits prior to issuing a decision document for the proposed action. NPS would apply for all applicable permits after a decision has been made and the design process has been completed to the extent necessary to support a complete application. NPS would obtain all required permits prior to starting construction.

TABLE 4. IS3000 – ISSUES: WILDLIFE

Concern ID 4: One commenter was concerned about the inclusion of increased development in the surrounding areas and the potential encroachment on wildlife habitat, which could be increased by the action alternatives.

NPS Response: Increased development in Wears Valley was included as a cumulative project and was analyzed for all the action alternatives under the wildlife impact topic as well as for surface water, vegetation, and karst resources to ensure the potential impacts were analyzed within a broader context beyond the project area.

Concern ID 5: Commenters questioned why only three groups of species were analyzed and noted the potential for high-quality habitat, as documented on Tennessee State Wildlife Action Plan (TN SWAP) maps. Commenters noted that the TN SWAP maps consider the area as high-priority habitat and requested a broader assessment of wildlife impacts in the EA, including nesting birds, amphibians, reptiles, bears, coyotes, and small mammals.

NPS Response: As noted in appendix E “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.”

Similarly, the Council of Environmental Quality (CEQ) states that an EA or environmental impact statement (EIS) should focus on pivotal issues or issues of critical importance and only discuss insignificant issues briefly (1502.2(b)).

With that guidance, the NPS planning team considered potential impacts of the project during the internal scoping process. During that process, the team reviewed the potential impacts on amphibians, small mammals, and coyotes. To help inform the amphibians discussion, the team reviewed a February 2020 survey for both reptiles and amphibians within the project area. The initial project design focused on avoiding wetlands and reducing stream crossings. The team recognized while there was not a direct connection between two wetlands, the placement of an access road could potentially affect travel between two larger wetlands. In this location, the team added a wildlife tunnel under the roadway to reduce the potential for impacts. As a result, potential impacts on amphibians were reviewed and minimized through design, and the impact topic was dismissed from full EA analysis. Similarly, the proposed alternatives could affect small mammals and coyotes, effects would be minor and did not rise to full EA analysis within the CEQ criteria.

Regarding the TN SWAP maps, the project area contains very low-, low-, and high-priority habitat according to the terrestrial TN SWAP map and a wide range of habitat from very low to high on the Combined Conservation Priorities map. Specifically, the high-quality habitat is focused on the streams in the project area. As noted in chapter 2, streams and wetlands would have a 60-foot average buffer from surface waters and wetlands. Overall, the TN SWAP and associated maps are intended to assess potential wildlife and habitats but are not based on site-specific survey or data. To support the impacts analysis for this EA, NPS completed amphibian, botany, bat, wetlands and surface waters, and bird surveys specific to the project area, in addition to previously documented site-specific NPS data. Compared to the TN SWAP maps, the data used to assess impacts in the EA provided for a more robust, site-specific analysis.

National Park Service, US Department of the Interior (NPS)

2015 *National Park Service NEPA Handbook*.
<http://www.nps.gov/applications/npspolicy/DOrders.cfm>

Concern ID 6: Commenters felt the trails would cause excessive fragmentation and noted that impacts on wildlife could be potentially significant.

NPS Response: NPS disagrees that the project would result in excessive habitat fragmentation. As defined in Wilcove et al., 1986, “Habitat fragmentation is often defined as a process during which a large expanse of habitat is transformed into a number of patches of a smaller total area, isolated from each other by a matrix of habitats unlike the original.” Trail construction does not meet this definition. Development of the road and trailheads were purposely situated to limit disturbance and fragmentation.

Wilcove, D. S., C. H. McLellan, and A. P. Dobson.

1986 Habitat Fragmentation in the Temperate Zone. Pp. 237-256 in *Conservation Biology: The Science of Scarcity and Diversity*.

Concern ID 7: One commenter questioned the EA analysis that daytime use of bicycles on trails would not affect roosting bats.

NPS Response: NPS has completed informal consultation with the US Fish and Wildlife Service (USFWS) pursuant to section 7 of the Endangered Species Act. On October 9, 2020, NPS submitted a biological evaluation (BE) to USFWS and requested concurrence on findings of “not likely to adversely affect” for the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), tricolored

bat (*Perimyotis subflavus*), and little brown bat (*Myotis lucifugus*). In a letter dated October 29, 2020, USFWS concurred with the Park's findings of not likely to adversely affect for these species.

The EA and BE analyzed potential impacts on roosting bats from noise and visual disturbance during construction and operational periods of the proposed action. The BE and EA cite previous biological opinions issued by USFWS (2008, 2002), which found that bats may tolerate substantial levels of noise and visual disturbance. The BE concludes "Overall, it is anticipated that noise or visual disturbance from visitor use of the trail system could initially result in behavioral responses to these stressors, potentially including avoidance of potential roosting sites directly adjacent to trails, particularly given that the action area currently does not currently experience high levels of visitor use. However, given the relatively minimal intensity of these impacts, compared to impacts associated with a major transportation corridor, it is reasonable to expect that bats would become habituated to visitor use of the trail system, and impacts would be insignificant over the long term."

US Fish and Wildlife Service (USFWS)

2002 *Biological Opinion on the Application for an Incidental Take Permit for the Federally Endangered Indiana bat (Myotis sodalis) for the Six Points Road Interchange and Associated Development.* US Fish and Wildlife Service, Bloomington, IN.

2008 *Biological Opinion on the Proposed Construction, Operation, and Maintenance of the Fort Drum Connector Project (NYSDOT PIN 7804.26) for the Federally Endangered Indiana Bat (Myotis sodalis).* US. Fish and Wildlife Service, Cortland, NY.

Concern ID 8: One commenter requested additional details regarding the proposed wildlife tunnel, including the effectiveness, size, and design considerations for predator avoidance.

NPS Response: Previous studies have indicated tunnels are successful in allowing amphibians to cross roadways, which can present a threat to amphibian populations when roads separate breeding ponds from upland, non-breeding habitat (Jackson 1996). Specific requirements for appropriate siting and composition, including predator avoidance, would be included as part of the design process moving forward.

Jackson, S. D.

1996 "Underpass systems for amphibians." 4 pp. In: G.L. Evink, P. Garrett, D. Zeigler and J. Berry (eds.) *Trends in Addressing Transportation Related Wildlife Mortality, Proceedings of the Transportation Related Wildlife Mortality Seminar.* State of Florida Department of Transportation, Tallahassee, FL. FL-ER-58-96.

TABLE 5. IS8000 – ISSUES: OTHER RESOURCES

Concern ID 9: Two commenters expressed concern that impacts from electric bicycles (e-bikes) were not adequately analyzed; the commenters specifically noted potential impacts on wildlife and noise impacts. One of the commenters requested only non-motorized mountain bikes be authorized to avoid collisions with black bears.

NPS Response: On September 28, 2021, the Park confirmed and redesignated the continued use of Class 1 and 2 e-bikes on Park areas where bikes are currently authorized under the Superintendent's Compendium. During that review process, the Park did not identify any potentially significant impacts associated with e-bikes. On pages 56 through 59 of the EA, potential impacts on wildlife from the

presence of mountain bikers, including noise, are discussed. Similarly, potential impacts from the noise from e-bikes are discussed in the visitor use and experience section beginning on page 49. For both projects, USFWS concurred with the overall Park findings.

Wildlife collisions are analyzed in the EA, with a focus on the potential for vehicle collisions along the access road. While the potential for wildlife collisions exist for e-bikes and other types of bikes, the probability of these collisions occurring is very low. Therefore, this issue was not carried forward for detailed analysis in the EA based on internal NPS scoping.

TABLE 6. MM1000 – MITIGATION MEASURES

<p>Concern ID 10: One commenter noted that the EA does not mention what will happen if a threatened or endangered bat species is observed during surveys conducted prior to hazardous tree removals.</p>
<p>NPS Response: The “Mitigation Measures” section of the Revised EA has been updated as follows to include additional information on removal of hazard trees that have bat roost tree characteristics. “Remove hazard trees only in consideration of bat protection requirements. If removal of a hazard tree with bat roost tree characteristics were needed between April 1 and November 14, NPS would have a qualified individual observe for bats for 30 minutes before and after sunset. The tree would be removed the following morning if bats were not observed. If bats were observed, the tree would be re-surveyed later and the tree would not be cut until survey confirms that bats are no longer roosting in the tree. In cases where imminent harm to life and property exists, hazard tree removal could be completed year-round in accordance with take exemptions under the 4(d) rule for the northern long-eared bat or the Park may temporarily close the area near the hazard tree until bats are no longer roosting in the tree.”</p>
<p>Concern ID 11: One commenter stated that ongoing monitoring and control for invasive plant species should occur beyond the 1-to-3-year period identified in the EA, since seeds can be spread from bike tires and hiking boots.</p>
<p>NPS Response: The “Mitigation Measures” section of the Revised EA has been updated to include the following additional information about long-term invasive plant management: “Conduct pre-construction invasive plant treatment/removal and post-construction monitoring and control for invasive plants for one to three years. After the initial post-construction monitoring and control period, invasive plant management would be integrated with the parkwide invasive plant management program. Long-term monitoring and control would be based observed conditions and management priorities.”</p>
<p>Concern ID 12: One commenter stated that traffic on Wear Cove Road/Line Springs Road has increased significantly in the last couple of years and that the EA needs to address this issue directly.</p>
<p>NPS Response: NPS shares public concerns regarding increased traffic on roads surrounding the Park. The NPS project team considered potential traffic and transportation issues associated with the proposed action as part of the internal scoping process and determined that environmental impacts associated with the issue were not central to the proposal or of critical importance. Furthermore, it was determined that detailed analysis of environmental impacts related to the issue was not necessary to make a reasoned choice between alternatives and that there were no potentially significant impacts to biophysical resources associated with the issue. Appendix E of the Revised EA provides the rationale for dismissing traffic and transportation issues from further analysis in the EA.</p>

Concern ID 13: One commenter suggested that wildlife could be relocated to other areas in the Park to mitigate impacts or that more plants and vegetation could be planted somewhere else in the Park.

NPS Response: As documented in the Revised EA beginning on page 21, NPS has committed to several mitigation measures aimed at reducing potential impacts on wildlife, wildlife habitat, and plants. Additionally, only 4% of the project area/existing habitat would be permanently disturbed under the selected alternative, limiting the potential impacts on wildlife and available habitat. Based on the analysis presented in the EA, NPS determined that additional mitigation measures such as relocating wildlife to other areas of the Park is not appropriate or warranted.

TABLE 7. ON1000 – OTHER NEPA ISSUES

Concern ID 14: One commenter stated that karst geology should not be excluded from analysis in the EA and noted that the point of NEPA is to analyze potential environmental impacts prior to deciding whether and how to proceed with a project.

NPS Response: NPS conducted a dedicated study to identify karst features in the project area in 2021. The results of this study as well as an analysis of potential impacts on karst resources and detailed mitigation measures to ensure protection of karst resources has been included in the Revised EA.

Concern ID 15: One commenter expressed concern about the timing of the public meeting and noted that it was days before the national election and on the last day of early voting. The commenter also noted that a link should be provided for people to watch the recorded meeting, and a transcript of the meeting should be made available to the public.

NPS Response: Thank you for your feedback on the public involvement process. Park management strives for continuous improvement in the ways we communicate with our stakeholders and will take this request into consideration for future public meetings.

TABLE 8. PN2000 – PURPOSE AND NEED: PARK PURPOSE AND SIGNIFICANCE

Concern ID 16: One commenter stated that alternative 3 is inconsistent with the main purposes of the Park.

NPS Response: The Park's *Foundation Document* (NPS 2016) contains the following purpose statement, which is based the Park's enabling legislation and the legislative history that influenced its development:

Great Smoky Mountains National Park preserves a vast expanse of the southern Appalachian Mountains ecosystem including its scenic beauty, extraordinary diversity of natural resources, and rich human history, and provides opportunities for the enjoyment and inspiration of present and future generations (NPS 2016).

As outlined in the *Foothills Parkway Master Plan* (NPS 1968) and stated in appendix A of the EA, the Parkway, which is part of the Park, serves two purposes: (1) to provide an appropriate view of 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

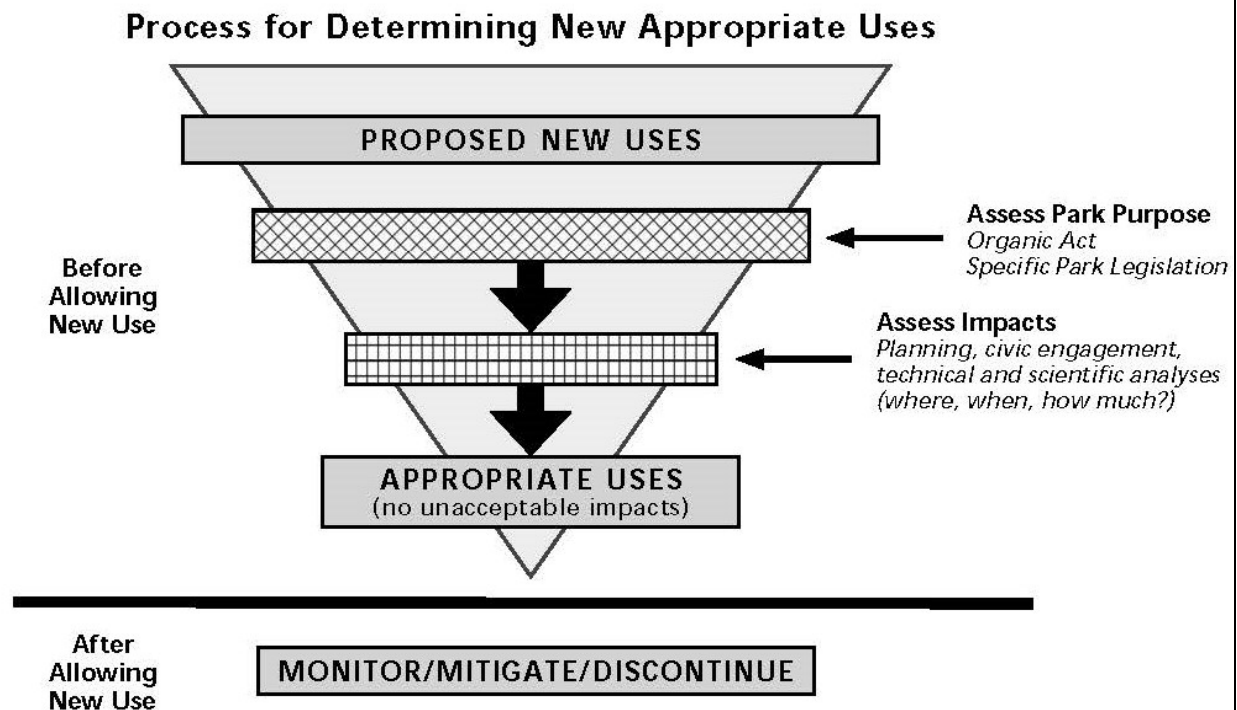
lands, providing adequate recreational facilities, and assuring the Parkway can be accessed from major roads. Previous NPS planning efforts completed between 1968 and 1984 (see appendix A of the EA for a summary of previous planning efforts) indicate that the Wears Valley portion of Section 8D should be one of the most highly developed along the Parkway based on its central location and other factors.

As outlined above, recreational use is an integral component of the Park's purpose, and recreational use of the Wears Valley portion of Parkway Section 8D has been planned since at least 1968. The framework for making management decisions regarding appropriate recreational and other park uses is provided in *NPS Management Policies 2006* (NPS 2006):

The National Park Service embraces appropriate use of the parks because these uses are key to the enjoyment of the parks and the appreciation and inspiration derived from the resources. Park resources have profound effects on those who experience them through appropriate park uses. An "appropriate use" is a use that is suitable, proper, or fitting for a particular park, or to a particular location within a park. Not all uses are appropriate or allowable in units of the national park system, and what is appropriate may vary from one park to another and from one location to another within a park.

In its role as steward of park resources, the National Park Service must ensure that park uses that are allowed would not cause impairment of, or unacceptable impacts on, park resources and values. When proposed park uses and the protection of park resources and values come into conflict, the protection of resources and values must be predominant. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the superintendent that it will not result in unacceptable impacts. The National Park Service will always consider allowing activities that are appropriate to the parks, although conditions may preclude certain activities or require that limitations be placed on them.

The below figure shows the process by which potential uses are evaluated for appropriateness.



Park managers believe that the proposed mountain bike trails would provide opportunities for visitors to enjoy the park, gain appreciation of park resources, and derive inspiration from the resources. However,

the proposed Wears Valley Mountain Bike Trail System project is currently in the “Assess Impacts” stage of the decision-making process. Therefore, a decision regarding the appropriateness of the proposed use is pending completion of the NEPA process and issuance of a decision document as well as the dissemination of a written determination consistent with the NPS Bike Rule.

National Park Service, US Department of the Interior (NPS)

- 1968 *Foothills Parkway Master Plan*. Great Smoky Mountains Foothills Parkway.
- 2006 *Management Policies*. US Department of the Interior, National Park Service, Washington, DC. https://www.nps.gov/policy/MP_2006.pdf
- 2016 Foundation Document. Great Smoky Mountains National Park, North Carolina and Tennessee. US Department of the Interior, National Park Service. October.

Concern ID 17: One commenter felt that a mountain bike trail system would threaten the wilderness qualities of the Park.

NPS Response: The project area is included in the General Park Development / Transportation zone in the Park’s General Management Plan, not within the Natural Environment Type 1 zone, which the Park manages as wilderness. NPS determined the action would not affect the wilderness qualities in areas managed as wilderness.

Concern ID 18: A commenter questioned the need for the proposed action because several other mountain biking areas exist on private and public lands in the region. The commenter also stated that NPS has assumed that unmet demand for off-road biking exists in or near the Park and that NPS thinks it must meet that demand.

NPS Response: The need for the proposed action is discussed in chapter 1 of the EA, which, in part, states that:

- 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.
- 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.

Considering stakeholder interests in how park lands can best be used for recreation is an important part of the NPS planning process. Accordingly, stakeholder input was considered in the decision to reinstate the recreational planning process for the Wears Valley portion of Parkway Section 8D. Several factors, including stakeholder interest and the fact that no purpose-built mountain bike trails exist in the Park, were also considered in the decision to propose mountain bike trails. However, providing unique opportunities for visitors to enjoy the park, gain appreciation of park resources, and derive inspiration from the resources was the primary consideration. Park managers feel no obligation to meet any perceived or actual unmet demand for mountain biking in the region.

Park managers also recognize that numerous mountain biking trails exist in the region and that additional trails will be developed outside the Park on private and public land in the future. While existing and future trails outside the Park provide for mountain biking, they would not address the need to provide opportunities for visitors to enjoy the park, gain appreciation of park resources, and derive inspiration from park resources.

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APPENDIX E: 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
<i>Actaea pachypoda</i>	White Baneberry	Common	G5	SNR
<i>Actaea</i> sp.	Baneberry	Unknown	N/A	N/A
<i>Allium tricoccum</i>	Ramps	Uncommon	G5	S1S2
<i>Cypripedium acaule</i>	Moccasin Flower	Uncommon	G5	S4
<i>Cypripedium parviflorum</i>	Lesser Yellow Lady's-Slipper	Rare	G5T3T5	SNR
<i>Panax quinquefolius</i>	American Ginseng	Uncommon	G3G4	S3S4
<i>Polygonatum biflorum</i> var. <i>biflorum</i>	King Solomon's Seal, Smooth Solomon's Seal	Common	N/A	N/A
<i>Polygonatum biflorum</i> var. <i>commutatum</i>	Great Solomon's Seal	Uncommon	N/A	N/A
<i>Sanguinaria canadensis</i>	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.

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.

References

National Park Service, US Department of the Interior (NPS)

- 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*.
- 2006 *Management Policies*. US Department of the Interior, National Park Service, Washington, DC. https://www.nps.gov/policy/MP_2006.pdf
- 2015 *National Park Service NEPA Handbook*.
<http://www.nps.gov/applications/npspolicy/DOrders.cfm>
- 2019a NPSPECIES User Guide. Integrated Resource Management Applications Portal. Last updated October 7, 2019.
https://irma.nps.gov/content/npspecies/Help/docs/NPSpecies_User_Guide.pdf

- 2019b NPSpecies, Information on Species in National Parks, Great Smokey National Park. Last updated October 7, 2019. Accessed August 27, 2020.
<https://irma.nps.gov/NPSpecies/Search/SpeciesList/GRSM>
- 2018 “Caves and Karst, Karst Landscapes.” Accessed October 9, 2020.
<https://www.nps.gov/subjects/caves/karst-landscapes.htm>
- 2020 *Spring and Late Summer Botanical Survey Report for the Wears Valley Mountain Bike Trail Network Plan and Metcalf Bottoms Access Improvements Projects*. Sevier County, Tennessee. Prepared by Allstar Ecology, Fairmont, WV. October.

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 F: 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**

January 2022

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 2.3 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.

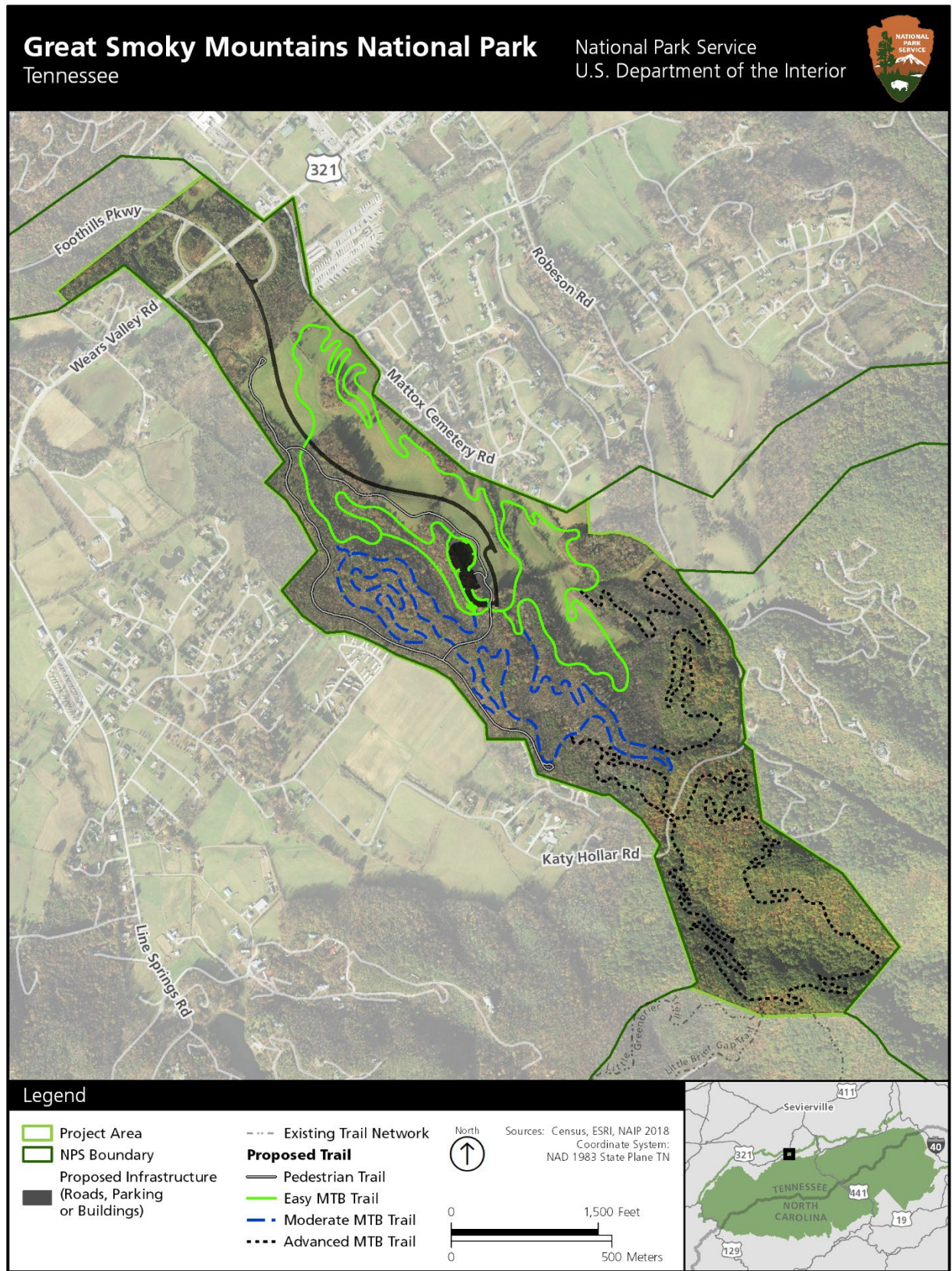


FIGURE 1. PROPOSED ACTION

Overall, the proposed action would require 25.4 acres of disturbance during the construction period. Of these 25.4 acres, 5.7 acres would be impervious surfaces for buildings, road, and parking areas and 11.8 acres would be pervious trail improvements, including areas adjacent to the 4-foot-wide trail surface that 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

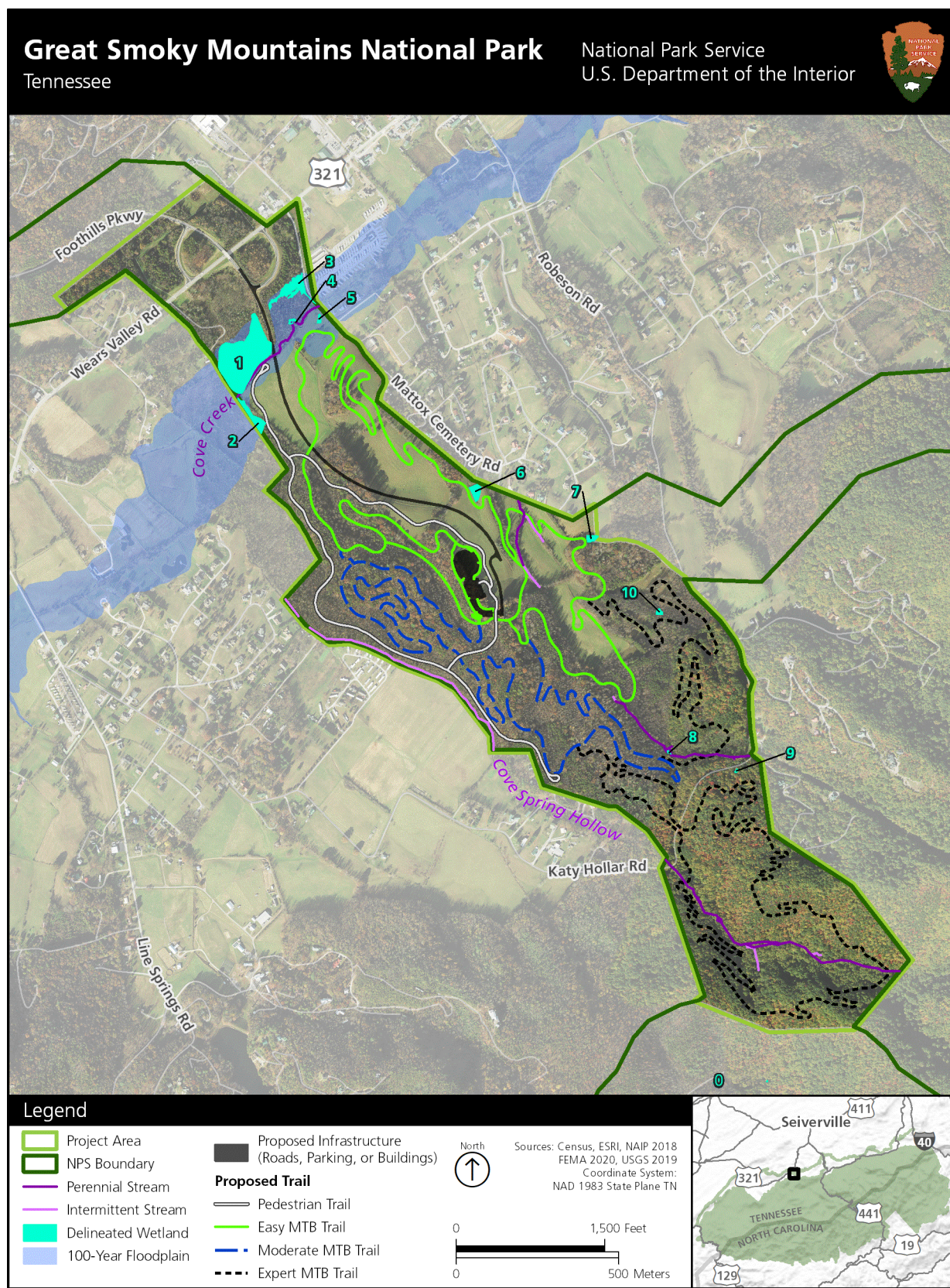


FIGURE 3. OVERVIEW OF FLOODPLAINS AND WETLANDS IN THE PROJECT AREA

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 pennsylvanica*), multiflora rose (*Rosa multiflora*), Canada goldenrod (*Solidago canadensis*), and American hog peanut (*Amphicarpaea bracteata*). 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.

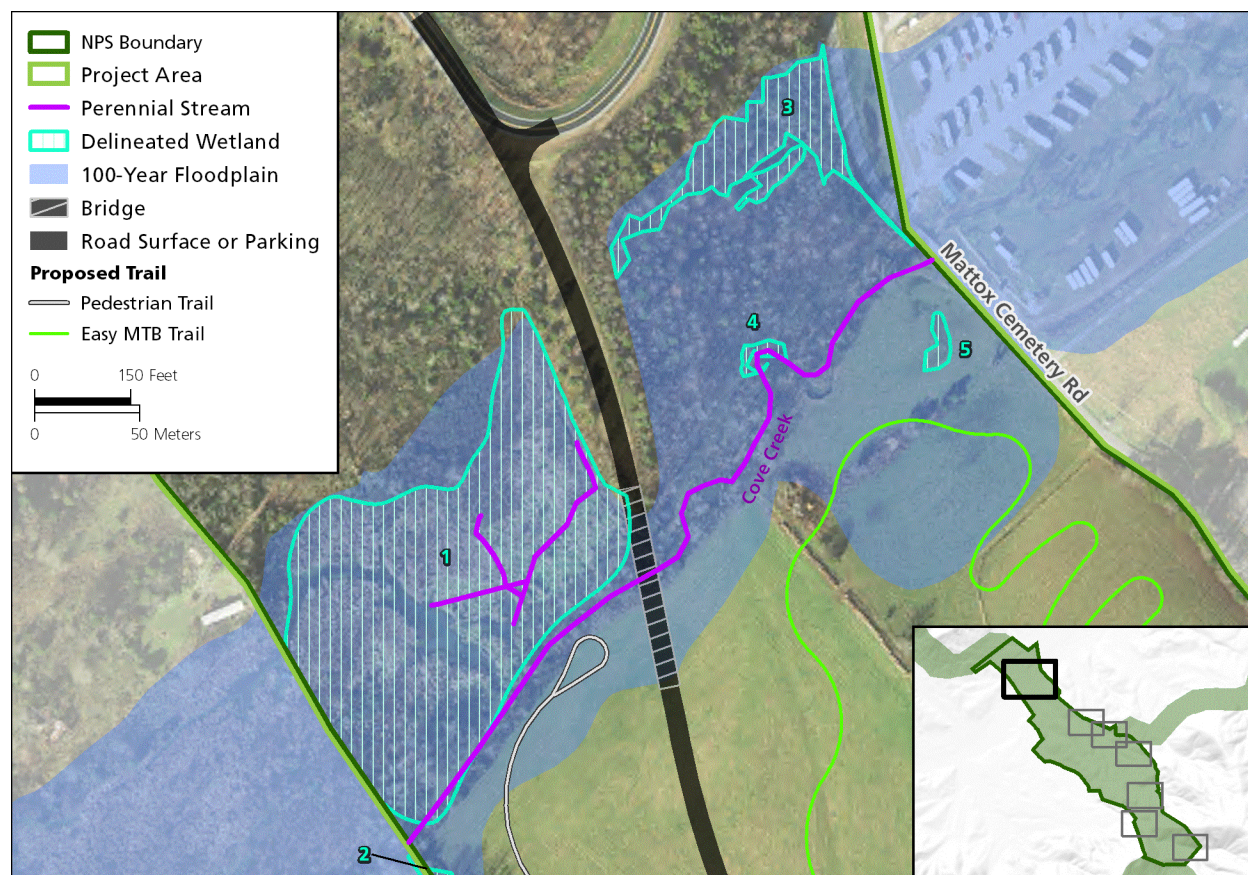


FIGURE 4. WETLANDS 1 THROUGH 5 AND STREAM CROSSING WITH ALTERNATIVES OVERLAY

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.

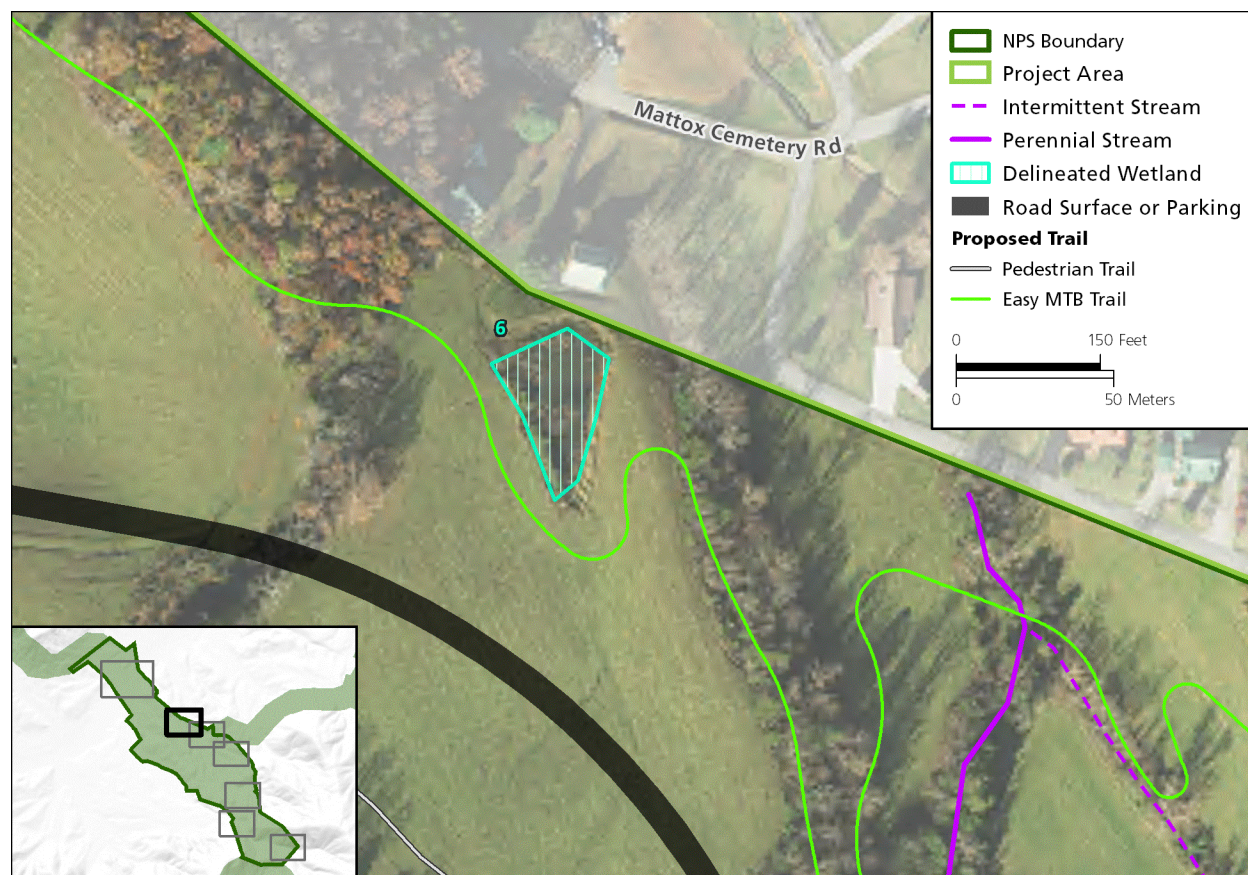
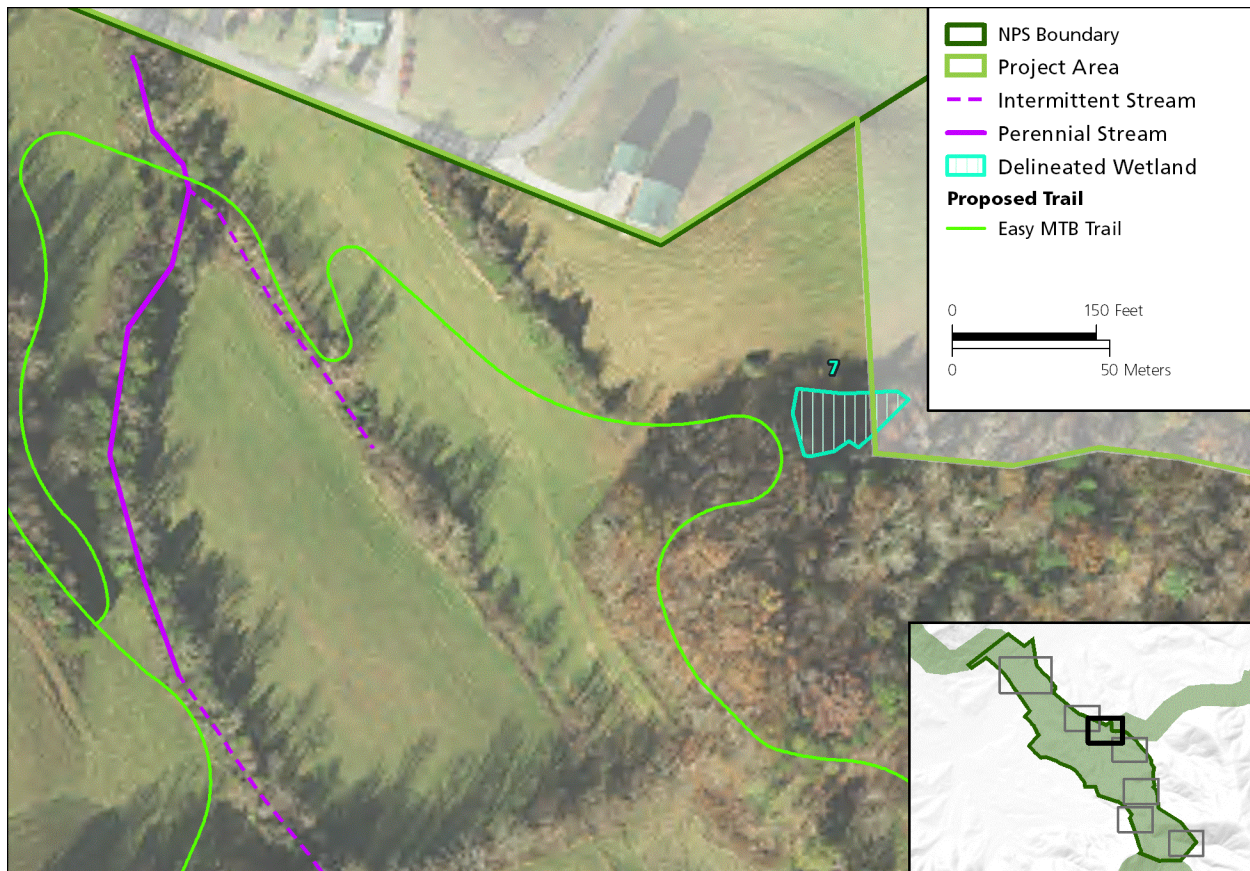


FIGURE 5. WETLAND 6 AND STREAM CROSSING WITH ALTERNATIVES OVERLAY

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 trifida*), 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.

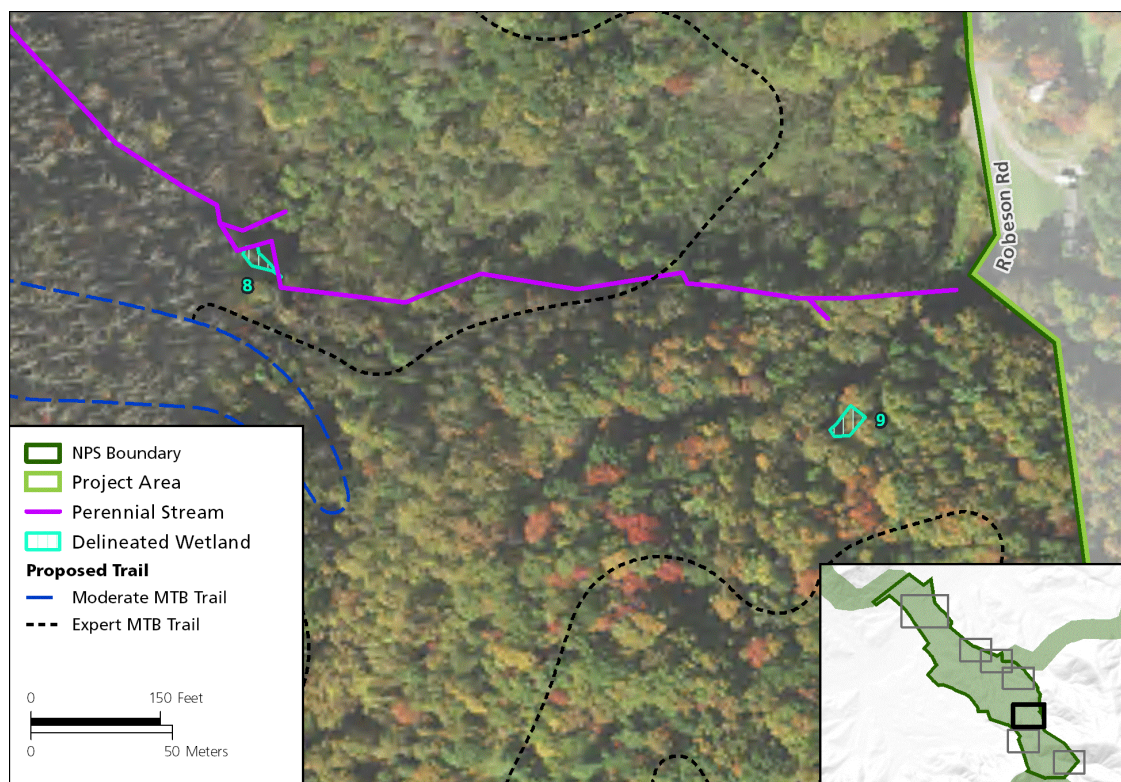


FIGURE 7. WETLANDS 8 AND 9 AND STREAM CROSSING WITH ALTERNATIVES OVERLAY

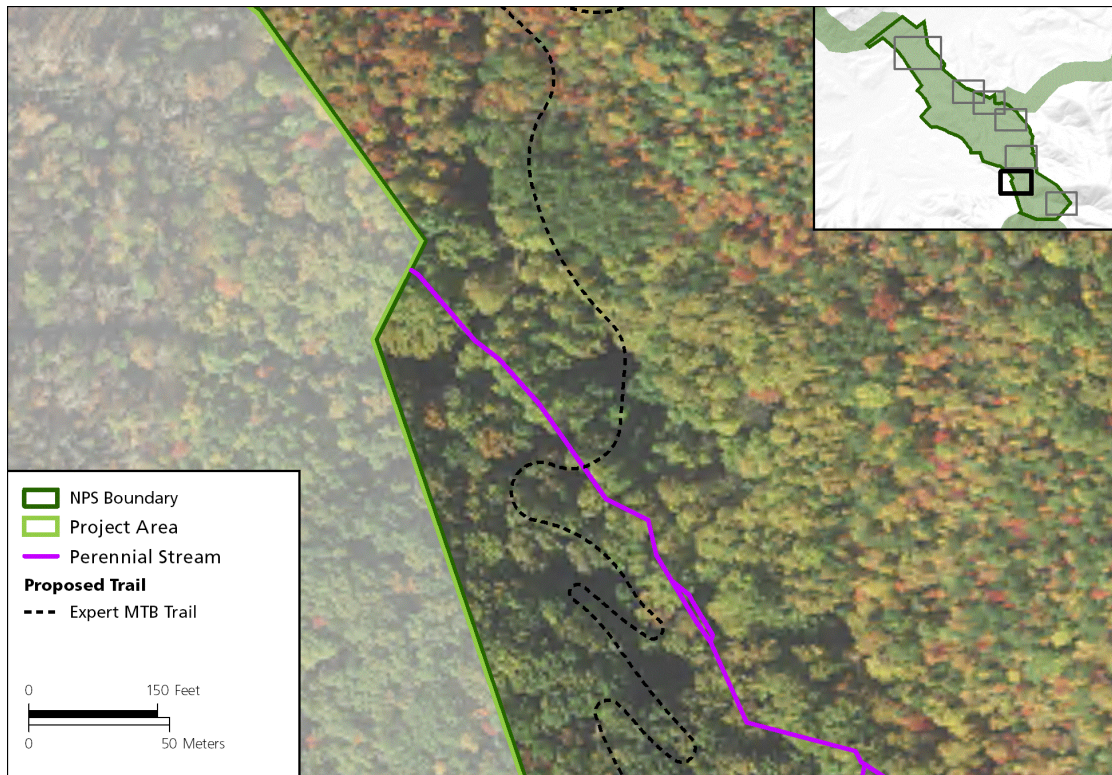


FIGURE 8. STREAM CROSSING LOCATION

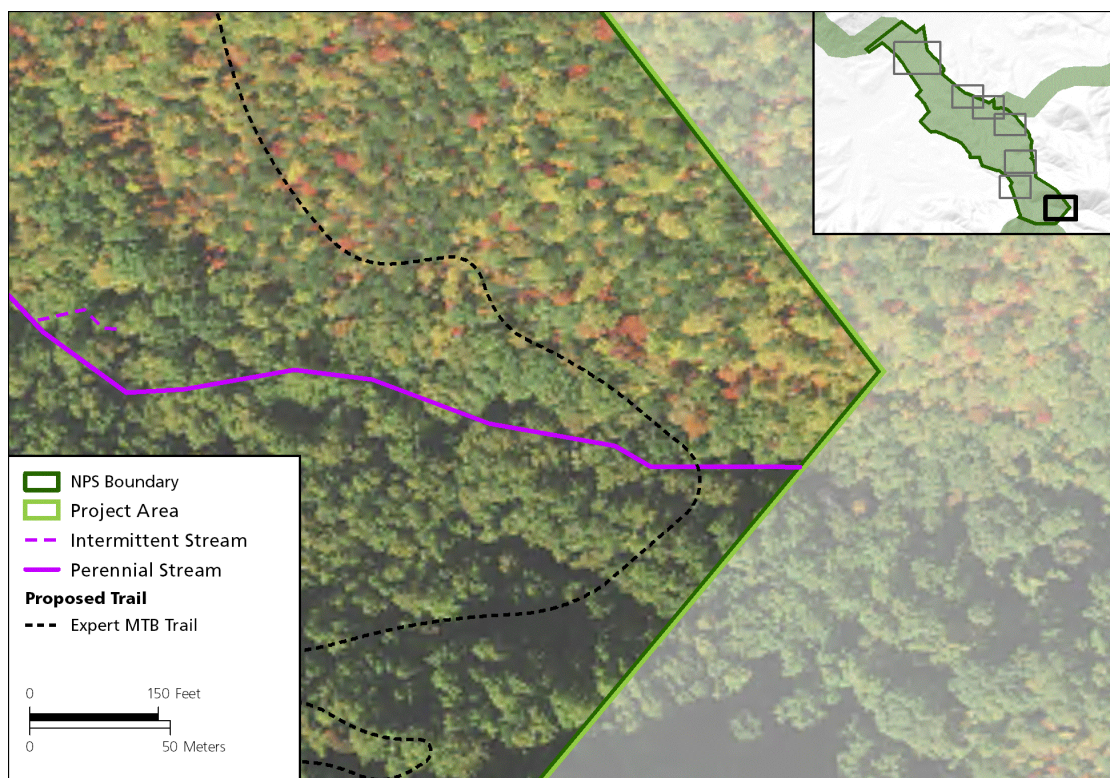


FIGURE 9. STREAM CROSSING LOCATION

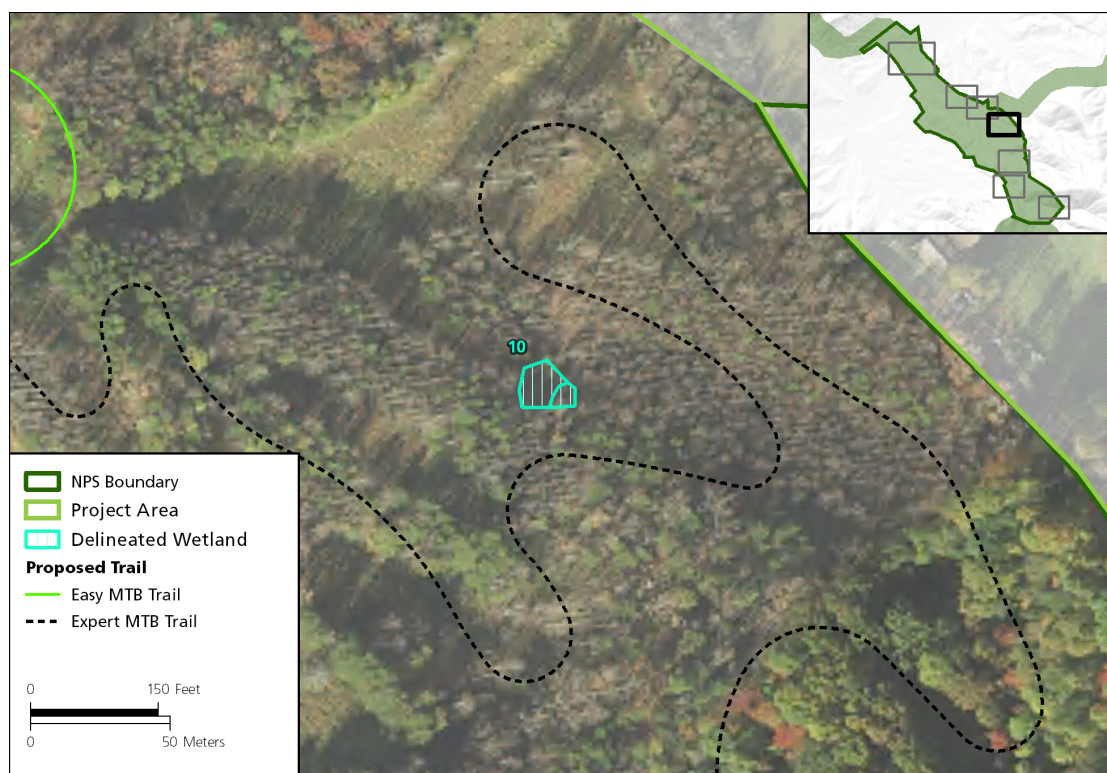


FIGURE 10. WETLAND 10 WITH ALTERNATIVES OVERLAY

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
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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

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APPENDIX G: 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 G-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 flycatcher⁴	<i>Empidonax virescens</i>	Common	Breeder	forest, water/wetlands	--
alder flycatcher	<i>Empidonax alnorum</i>	Occasional	Migratory	water/wetlands	--
American bittern	<i>Botaurus lentiginosus</i>	Occasional	Migratory	water/wetlands	SC
American black duck⁵	<i>Anas rubripes</i>	Occasional	Migratory	water/wetlands	--
American coot	<i>Fulica americana</i>	Occasional	Migratory	water/wetlands	--
American Crow^{4,5}	<i>Corvus brachyrhynchos</i>	Common	Breeder	developed, grassland/pasture	--
American goldfinch^{4,5}	<i>Spinus tristis</i>	Common	Breeder	developed, grassland/pasture	--
American kestrel⁵	<i>Falco sparverius</i>	Rare	Resident	developed, grassland/pasture	--
American pipit⁵	<i>Anthus rubescens</i>	Uncommon	Migratory	grassland/pasture	--
American redstart	<i>Setophaga ruticilla</i>	Uncommon	Resident	forest, water/wetlands	--
American robin^{4,5}	<i>Turdus migratorius</i>	Common	Breeder	all types	--
American wigeon	<i>Anas americana</i>	Occasional	Migratory	water/wetlands	--
American woodcock⁵	<i>Scolopax minor</i>	Uncommon	Breeder	forest	--
bald eagle⁵	<i>Haliaeetus leucocephalus</i>	Uncommon	Resident	water/wetlands	BCC (USFWS 2008)
bank swallow	<i>Riparia</i>	Occasional	Migratory	grassland/pasture, water/wetlands	--
barn owl⁵	<i>Tyto alba</i>	Common	Resident	all types	--
barn swallow^{4,5}	<i>Hirundo rustica</i>	Common	Breeder	developed, grassland/pasture, water/wetlands	--
barred owl	<i>Strix varia</i>	Uncommon	Breeder	forest, water/wetlands	--
bay-breasted warbler	<i>Setophaga castanea</i>	Uncommon	Migratory	forest, water/wetlands	--
belted kingfisher⁵	<i>Megaceryle alcyon</i>	Uncommon	Breeder	water/wetlands	--
black scoter	<i>Melanitta nigra</i>	Occasional	Vagrant	water/wetlands	--

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

Common Name	Scientific Name	Abundance ¹	Occurrence ²	Preferred Habitat Type(s)	Special Status ³
Canada warbler	<i>Cardellina canadensis</i>	Common	Breeder	developed, grassland/pasture, water/wetlands	BCC (USFWS 2008, 2020)
canvasback	<i>Aythya valisineria</i>	Rare	Migratory	water/wetlands	--
Cape May warbler	<i>Setophaga tigrina</i>	Uncommon	Migratory	all types	--
Carolina chickadee^{4,5}	<i>Poecile carolinensis</i>	Common	Breeder	developed, forest, water/wetlands	--
Carolina wren^{4,5}	<i>Thryothorus ludovicianus</i>	Common	Breeder	developed, forest, water/wetlands	--
cedar waxwing^{4,5}	<i>Bombycilla cedrorum</i>	Uncommon	Breeder	developed, water/wetlands	--
Cerulean Warbler	<i>Setophaga cerulea</i>	Rare	Breeder	forest	BCC (USFWS 2008), N
chestnut-collared longspur	<i>Calcarius ornatus</i>	Occasional	Vagrant	grassland/pasture	--
chestnut-sided warbler^{4,5}	<i>Setophaga pensylvanica</i>	Common	Breeder	forest	--
chimney swift⁵	<i>Chaetura pelagica</i>	Common	Breeder	developed, grassland/pasture	--
chipping sparrow⁵	<i>Spizella passerina</i>	Common	Breeder	all types	--
chuck-will's-widow	<i>Antrostomus carolinensis</i>	Rare	Breeder	forest	--
cliff swallow	<i>Petrochelidon pyrrhonota</i>	Occasional	Migratory	developed, grassland/pasture	--
common goldeneye	<i>Bucephala clangula</i>	Occasional	Migratory	water/wetlands	--
common grackle^{4,5}	<i>Quiscalus quiscula</i>	Uncommon	Breeder	developed, grassland/pasture	--
common loon	<i>Gavia immer</i>	Occasional	Migratory	water/wetlands	--
common merganser	<i>Mergus merganser</i>	Occasional	Breeder	water/wetlands	--
common nighthawk	<i>Chordeiles minor</i>	Rare	Migratory	developed, grassland/pasture	--
common raven⁵	<i>Corvus corax</i>	Uncommon	Breeder	developed, grassland/pasture	--
common snipe	<i>Gallinago gallinago</i>	Rare	Migrant	water/wetlands	--
common starling^{4,5}	<i>Sturnus vulgaris</i>	Rare	Breeder	developed, grassland/pasture	--
common yellowthroat⁵	<i>Geothlypis trichas</i>	Uncommon	Migrant	water/wetlands	--
Connecticut Warbler	<i>Oporornis agilis</i>	Occasional	Migratory	developed, grassland/pasture, water/wetlands	--
Cooper's Hawk⁵	<i>Accipiter cooperii</i>	Rare	Resident	developed, forest	--

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

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

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

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

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

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

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