



National Park Service

U.S. Department of the Interior

Buffalo National River
Arkansas

Environmental Assessment

Tyler Bend Trails Plan

October 5, 2018

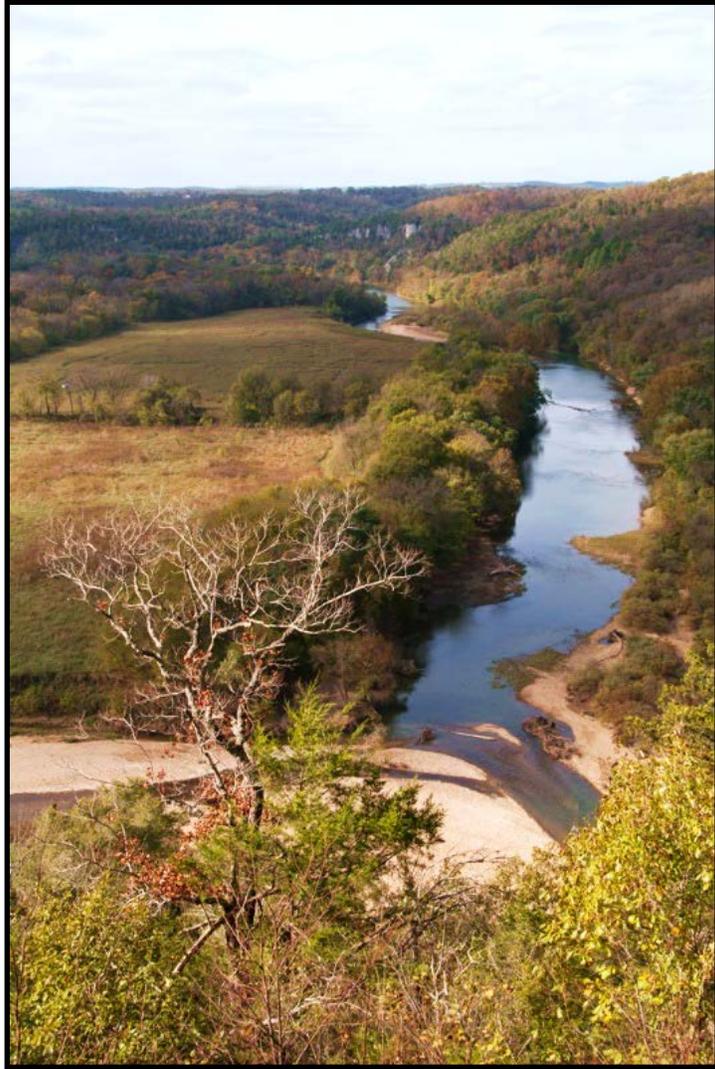


Image: View of Buffalo National River from Tyler Bend overlook

Environmental Assessment

Tyler Bend Trails Plan

Public Comment

If you wish to comment on the environmental assessment, you may mail comments to the address below or post comments online at <http://parkplanning.nps.gov/BUFF>. This environmental assessment will be open to public review for 30 days. Before including your address, phone number, email address, or other personal identifying information in your comments, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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Image: Sod Collier Homestead

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Purpose and Need

Introduction

Buffalo National River is located in Newton, Searcy, Marion, and Baxter Counties in north central Arkansas. The Tyler Bend Area, located in the middle district of the park, is eleven miles north of Marshall, Arkansas in Searcy County, on Highway 65. The river was designated a national river in 1972 “for the purposes of conserving and interpreting an area containing unique scenic and scientific features, and preserving as a free-flowing stream an important segment of the Buffalo River for the benefit and enjoyment of present and future generations” (Public Law 92-237, March 1, 1972). Buffalo National River is a popular park with more than 1.4 million visitors annually. The Tyler Bend Area accounts for approximately 5% of the visitation to the park. Over the last decade, visitation to the Tyler Bend area has fluctuated around 68,000 visitors annually. The Tyler Bend area offers many opportunities for outdoor recreation including access to the river, hiking, camping, picnicking, photography, and exploring historic sites.

The park has approximately 134 miles of trails that lead visitors to scenic vistas, historic places, and natural wonders. Currently, visitors who wish to explore the park by bicycle are limited to park roads and adjacent county roads. Throughout the park, bicycling is permitted on all park roadways unless otherwise posted or restricted due to seasonal closures.

The Tyler Bend Area, on the south side of the Buffalo River, offers over 25 miles of hiking trails. Of the trails included in the project area, the River View trail is one of the most popular trails for visitors and visitor groups including schools and/or interest groups. This trail leads visitors past the Sod Collier Homestead and to an overlook deck where scenic views of the river can be experienced. The Buffalo River Trail serves as the spine of the trail network in this area, connecting the Spring Hollow, Buck Ridge, and Rock Wall trails.

The National Park Service (NPS) is proposing to make improvements to the trail system at Tyler Bend, to allow more and different types of use. This Environmental Assessment (EA) evaluates two action alternatives. This EA also assesses the impacts that could result from continuing to maintain the existing trail system (no action alternative) or implementation of either action alternative. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA), the NPS Bicycle Rule (36 CFR 4.30), NPS Director’s Order 12, and 2015 NPS NEPA Handbook.

This Tyler Bend Trails Plan (Trails Plan) fulfills a park priority for facility asset management, resource management, and visitor experience at Buffalo National River and serves as a component of the park’s planning portfolio. This follows the National Park Service’s “Planning Portfolio” construct, consisting of a compilation of individual plans, studies, and inventories, which together guide park decision making. The planning portfolio enables the use of targeted planning products (such as this one) to meet a broad range of park planning needs. The general management plan remains a critical piece of the planning framework and will be revised in a timely manner through the park’s planning portfolio.

Purpose of and Need for Action

The purposes of modifying trails at Tyler Bend is to expand recreational opportunities for visitors in the park; increase visitor use of the park, the established trail system, and the campground areas; and to promote the health and wellbeing of visitors to Buffalo National River. The proposed trail modifications in this EA will increase trail sustainability by reducing potential for erosion and loss of trail tread.

The proposed project would expand recreational opportunities, a fundamental resource and value of the park (NPS 2012), while promoting health and well-being in support of initiatives such as Healthy Active Arkansas

and the NPS Explore for Health and Healthy Parks—Healthy People. Additionally, adding other recreational opportunities supports the federal policy of promoting the health and personal fitness of the general public. Buffalo National River has received multiple requests from individuals and interest groups to include cycling opportunities as a new form of recreation at Buffalo National River. In response to these requests, the park is evaluating the feasibility of converting some of the trails within the Tyler Bend area to allow the use of bicycles.

The park proposes to modify some of the trails in areas where trail tread (surface of the trail), erosion, or visitor safety is of concern. The proposed trail modifications include creation of one new trail and upgrading a section of another to provide visitors with mobility impairments access to one segment of the River View Trail. Signs would be posted at major trail access points giving information about the trail to allow users to judge how well the trail suits their needs and abilities.

Objectives for the proposed action include:

- expand recreational opportunities within the park;
- provide for new visitor experiences within the park;
- develop trail connections to other recreational opportunities in the area such as camping, canoeing, exploring, picnicking, photography, etc.;
- address existing erosion issues and trail tread sustainability through trail modifications of existing trails;
- provide universal access to a portion of the trail network;
- provide a safe multiuse trail system; and
- promote the health and well-being of park visitors.

Relationship to Other Laws, Regulations, and Policies

Several laws, regulations, and federal policies guide the decisions and actions regarding this EA. The primary legal and regulatory requirements that relate to the designation of trails for multi-use purpose including bicycles include the following.

Bicycling is a popular activity in national parks and bicycle riders of all skill levels and ages enjoy riding on park roads and designated bicycle trails for beautiful scenery, exercise, and adventure. The National Park Service (NPS) believes that, with proper management, bicycling is an appropriate recreational activity in many park areas. Title 36 of the Code of Federal Regulations, Part 4.30 (36 CFR §4.30) provides the administrative pathway to allow bicycle use in non-developed areas. Construction and use of the multi-use trails should not require any changes to existing legislation or management policies. According to 36 CFR §4.30, bicycle use within national parks is limited to park roads unless otherwise specified. Designating trails for bicycle use outside of specifically designated developed areas requires that the park carefully consider the impacts of adding bicycle use to the trail.

The rule states that the superintendent may designate bicycle use on an existing trail that would not require any construction or significant modification to accommodate bicycles. Prior to doing so, a planning document would need to evaluate the suitability of existing trail surfaces and soil conditions for accommodating bicycle use, including any maintenance, minor rehabilitation, or armoring that would be necessary to upgrade the trail to sustainable condition. Life cycle maintenance costs, safety considerations, strategies to prevent or minimize user conflict, and methods to protect natural and cultural resources and mitigate impacts also need to be analyzed. An EA or EIS must be completed that evaluates the effects of bicycle use in the park and on the specific trail(s), including a 30-day public comment period. If there is no finding of significant impact, the superintendent is required to provide a written determination that the addition of bicycle use on the existing

trail is consistent with the protection of the park area's natural, scenic and aesthetic values, safety considerations, and management objectives, and does not disturb wildlife or park resources.

New trails requiring trail construction activities must be developed and constructed in accordance with appropriate NPS sustainable trail design principles and guidelines. If the new trail is proposed in a developed area, the superintendent would complete a planning document with the same requirements as per the requirements explained above for existing trails. If the new trail is proposed outside of a developed area, a special regulation authorizing the bicycle use would be required.

Administrative roads closed to motor vehicle use by park visitors are also closed to bicycle use, unless the superintendent makes a written determination and opens the road to such use. The rule requires the superintendent's written determination to state that such bicycle use is "consistent with protection of the park area's natural, scenic and aesthetic values, safety considerations and management objectives, and will not disturb wildlife or park resources" (46 CFR 4.30(b)(1)).

Issues and Impact Topics

This section identifies the impact topics that could be affected by the alternatives. Impact topics are derived from issues identified during internal and public scoping. When determining whether to retain an issue for more detailed analysis in this EA, the interdisciplinary team considered, among other things, whether or not:

- the environmental impacts associated with the issue are central to the development of a multi-use trail system 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.

Ultimately, it is important for decision makers and the public to understand the impacts that each of the alternatives under consideration would have on specific resources. Therefore, the NPS uses "impact topics" as headings to indicate which resources would be affected and to organize the discussions of the affected environment and environmental consequences section.

The impact topics carried forward for analysis in Chapter 3 of this EA include:

- **Soils** – The proposed actions in this EA have the potential to adversely impact soils in the project area. Impacts could include erosion, compaction, or loss of trail tread.
- **Special Status Species** – Under the Endangered Species Act (ESA), the NPS has the responsibility to address impacts to federally listed threatened or endangered species. National Park Service policy dictates that an assessment of impacts for federal candidate species, proposed federal species, and state listed species occur during the NEPA process. There are seven Federally listed species, five, State listed species, and three NPS special status species that are, or may be, present within the project area.
- **Human Health and Safety** – Mountain biking has inherent risks and these risks may impact the safety of users on the trail, thus this topic will be retained.
- **Visitor Use and Experience** – Visitor and employee safety and health are protected and considered in all management actions. Visitor use and experience could be impacted by the proposed actions in this EA.
- **Operations and Maintenance** – Park Operations contribute to protecting, restoring, and maintaining natural and cultural resources. Park operations and maintenance could be impacted from the proposed actions in this EA.

Impact Topics Dismissed from Further Analysis

Using the same considerations noted previously, the following impact topics were initially considered but were subsequently dismissed from further analysis.

Air Quality. The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) was established to promote the public health and welfare by protecting and enhancing the Nation’s air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with NPS units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. The majority of Buffalo National River, including the Tyler Bend area and trail system is designated as a Class II air quality area under the Clean Air Act as amended. A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in §163 of the Clean Air Act. State air quality laws and regulations are available on-line at the Arkansas Department of Environmental Quality website.

Construction activities associated with trail modification or mowing vegetation could result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized, and would likely dissipate rapidly because air stagnation at Buffalo National River is rare. The project could result in degradation of local air quality; however, such effects would be negligible because they would be short-term, lasting only while construction activities involving heavy equipment are taking place. The Class II air quality designation for Buffalo National River would not be affected by the proposed action. Furthermore, because the Class II air quality would not be affected, there would be no unacceptable effects; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. The topic of Air Quality is dismissed from further analysis in this EA because there would be negligible effects on air quality, and the proposed actions would not result in any unacceptable effects.

Cultural Resources. One of the most important management goals of the park is to protect and conserve the cultural resources of Buffalo National River. The entire park is an outstanding cultural landscape that embraces the overall story of Ozark settlement and history from the first prehistoric inhabitants to today’s living rural community of Boxley Valley.

Some of the most fertile lands along the Buffalo River were in the Tyler Bend area on the middle Buffalo. These fertile lands attracted many settlers resulting in a variety of prehistoric and historic resources. Tyler Bend’s historic resources include the architectural and engineering legacy of buildings, structures, landscapes, objects, roads, and trails. These provide the visitor with a physical connection to Ozark history and a laboratory for research topics such as pioneer homesteads, industry, and recreation.

Historic contexts and site types represented in the Tyler Bend vicinity include settlements (dwellings, house sites, and cemeteries), agriculture (family farms), transportation (ferries), and education (schools).

Six archeological surveys have been completed throughout the project area. Over 14 prehistoric and historic archeological sites have been recorded. Only one of these archeological sites is in an area where trails would be constructed, rerouted, or modified. This particular site was studied in great detail, and it has been determined that trail construction here would not affect the archeological resources of this site. Adding the additional recreation use of mountain biking is not likely to further impact the cultural resources beyond their current condition. For this reason, cultural resources have been excluded from analysis in this EA.

Environmental Justice. Presidential Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (1998) requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high

and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

According to the Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. The goal of ‘fair treatment’ is not to shift risks among populations, but to identify potentially disproportionately high and adverse environmental effects, and identify alternatives that may mitigate these impacts.

Searcy County contains both minority and low-income populations; however, environmental justice was dismissed as an impact topic for the following reasons:

- The NPS will actively solicit public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of any alternative would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect adverse effects on any minority or low-income population.
- The environmental impacts associated with implementation of any alternatives would not disproportionately affect any minority or low-income population or community.
- Implementation of any alternatives would not result in any identified environmental effects that would be specific to any minority or low-income community.
- The economic impacts resulting from implementation of any of the alternatives would not disproportionately affect minority or low-income populations. In addition, the park staff and planning team do not anticipate that the impacts on the socioeconomic environment would alter the physical and social structure of nearby communities.

Based on this rationale, environmental justice was dismissed and not carried forward for analyses in this EA.

Indian Trust Resources. Secretarial Order 3175 mandates any anticipated impacts to Indian trust resources from proposed projects or actions by the Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources at the park. The lands surrounding the river are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. This topic is dismissed from further analysis in this EA because there are no Indian trust resources.

Socioeconomics. The NPS is directed to collaborate with community and tourism professionals to promote sustainable and informed tourism that incorporates socioeconomic and ecological concerns and supports long-term preservation of park resources and quality visitor experiences. Buffalo National River is a strong economic engine for the surrounding area. In 2017, more than 1.5 million visitors contributed \$71.1 million to the local economy, and supported 911 jobs related to tourism. The establishment of a multi-use trail system is not expected to impact the local or regional population, income, or employment, except that more visitors may come to the park for this amenity. If mountain biking becomes a very popular activity, the park may offer commercial use authorizations for private businesses to supply bikes and transportation to visitors, but any impacts are speculative at this time. The impacts to socioeconomics is not likely to be significant compared to the existing economic impact of the park, thus socioeconomics was dismissed from further analysis.

Soundscape. The NPS 2006 Management Policies and Director’s Order 47 states the preservation of natural soundscapes associated with National Park units as an important component of NPS’s mission. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable vary throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

Although local soundscapes may be temporarily affected by vehicles and equipment during new trail construction or modification activities, these effects are expected to be minimal. The temporary increase in noise due to trail modifications activities is not expected to impact the overall tranquility and solitude associated with Buffalo National River thus, this topic was dismissed from further consideration as a standalone topic. An increase in sounds from new uses on the trail network are possible but likely negligible compared to current uses.

Wildlife (including invasive species). The NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals (NPS 2006). Wildlife commonly found at Buffalo National River include elk (*Cervus canadensis*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), North American opossum (*Didelphis virginiana*), bobcat (*Lynx rufus*), American mink (*Neovison vison*), black bear (*Ursus americanus*), North American beaver (*Castor canadensis*), and feral pigs.

All of the proposed improvements/modifications to the Tyler Bend trails would occur in areas that are already developed and receive frequent human visitation. Typically, wildlife avoid these areas during the daylight hours to avoid humans. While wildlife are likely to avoid these areas during the day, the addition of bicycle use to some of the trails in the Tyler Bend area could create a potential for wildlife–cyclist collisions, especially along curves of the trail. It is unlikely that large game species like deer or elk would be impacted, but smaller wildlife like snakes or lizards could be affected injured or killed by bicycle tires. The additional use on the trails could increase the risks of impacts to wildlife, but those risks would likely have minimal negligible adverse effects due to a likely low incidence rate of collisions. The amount of vegetation disturbance related to modifications of the trail would be minimal and would result in negligible adverse impacts to wildlife and wildlife habitat in areas where trails are modified. During the modification process, noise would also increase, which may disturb wildlife in the general area. Construction-related noise would be temporary and sporadic, lasting up to six weeks and existing sound conditions would resume following trail modification activities. Therefore, the temporary noise from trail modifications would have a negligible adverse effect on wildlife. Trail modifications would result in minimal loss of vegetation and wildlife habitat, thus a negligible overall loss of wildlife habitat. Additionally, minor or negligible effects would not result in any unacceptable effects; the proposed actions are consistent with § 1.4.7.1 of NPS *Management Policies*, 2006. This topic is dismissed from further analysis in this EA because these effects are negligible and would not likely result in any unacceptable effects.

Vegetation (including invasives). The NPS *Management Policies*, 2006 and other NPS and park policies provide general direction for the protection of vegetation. The NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006). The vegetation communities within Buffalo National River are diverse with over 1,500 species of plants. The major type of vegetation within the Tyler Bend area is Mixed and Oak Hardwood forests, and herbaceous grassland fields. The proposed trail modifications would clear less than one acre of vegetation. Most of the trail work which would result in a loss of vegetation would be in areas where trails currently exist and have been disturbed; therefore, the removal and/or disturbance of vegetation in the project area is expected to result in negligible adverse effects to vegetation.

The topic of vegetation is dismissed from further analysis in this EA because the effects on vegetation are negligible and would not result in any unacceptable impacts.

Alternatives

This section describes the no-action alternative and two action alternatives that the NPS is considering for trail modifications and use in the Tyler Bend area of the park. Alternatives represent different means for meeting the purpose, need, and objectives described in Chapter 1. A range of alternatives were developed that includes a set of reasonable alternatives as well as other alternatives considered but eliminated from detailed analysis. A reasonable alternative is one that is technically and economically feasible as well as meets the project objectives to a large degree. A summary table of the key components of each alternative can be found in Table 1.

TABLE 1. COMPARISON OF PROPOSED ACTIONS BY ALTERNATIVE

Proposed Action	Alternative A	Alternative B	Alternative C
Hiking and walking would continue to be allowed on Tyler Bend area trails.	X	X	X
Modify a 0.5 mile section of the River View Trail to be wheelchair accessible.		X	X
300–400-ft reroute below the Overlook Deck on the River View Trail. Reroute would include continuing the trail as a switchback “S” sweeping into long smooth corners and then connection to the existing Return Trail.		X	X
Reroute 0.40 miles of the Spring Hollow Trail due to erosion issues.		X	X
Relocate the Buck Ridge Bridge crossing the Spring Hollow Trail bridge to the newly established Spring Hollow Trail.		X	X
Create new Spur Trail through agricultural permit field connecting the Tyler Bend area campgrounds to the River View Trail.		X	X
Trail modifications such as: benchwork, rock armoring, trail alignment, trail widening, tread smoothing, etc.		X	X
Additional modifications for mountain biking			X
Update signs to include new Spur Trail		X	X
Update signs to indicate allowable uses on trails (may include additional signs).			X
Include information on trail signs such as the International Mountain Biking Association Trail Difficulty Ratings.			X

Alternative A – No-Action Alternative

Under this alternative, current management would continue for the trail system in the Tyler Bend area. No mountain biking would be allowed and there would be no significant modifications to the trails or trail surfaces. Infrequent maintenance activities would continue as needed.

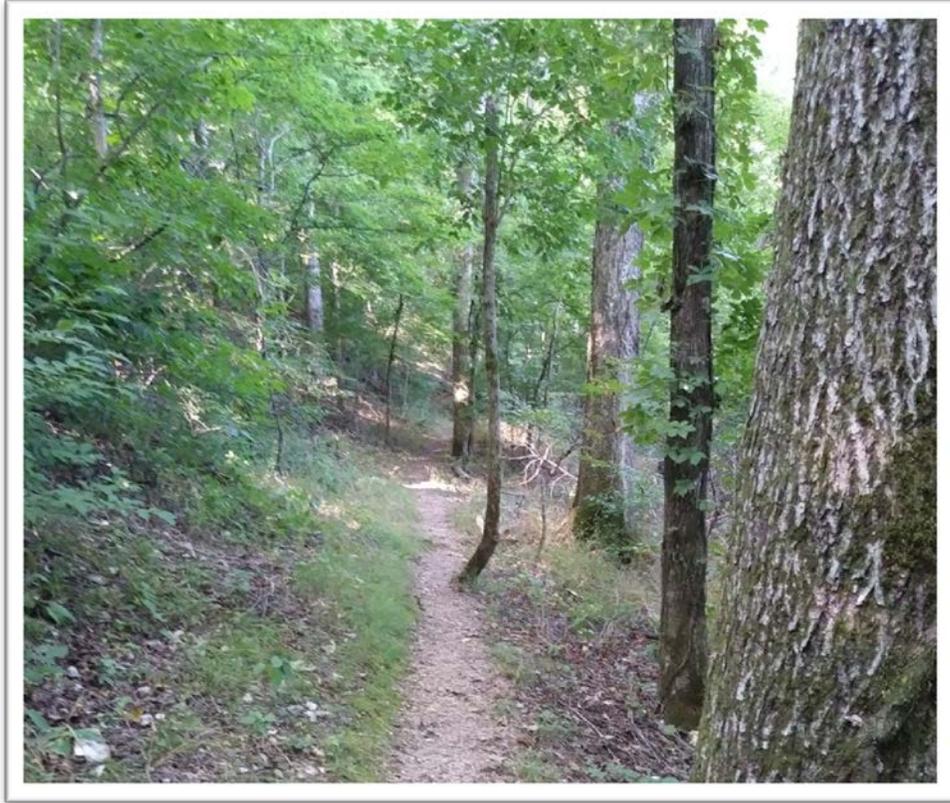


Image: River View Trail segment with trees close to trail.

Common to All Action Alternatives

All trails within the Tyler Bend trail area of the park were reviewed by a consultant who specializes in mountain biking trails on 13 April 2017. The modifications for each trail described in the action alternatives were mutually agreed upon by NPS and trails specialists as modifications that could result in safer trails for both hikers and bikers, and enhance the sustainability of the trails within the Tyler Bend trail area.

Mitigation Measures

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects to the park resources and would be implemented with either of the action alternatives, as needed.

General

- New information signs would be limited to the areas within the construction limits;
- All construction activity, including vehicle and material use and storage would not be allowed outside predetermined, marked construction/staging zones and would be within four miles of the project area.
- No imported fill material would be allowed under the proposed action.

Biological Resources (including fish, wildlife, plants, exotic species, and special status species)

- Project work such as mowing vegetation for trail maintenance, or brush cutting equipment use, may be curtailed in some areas during sensitive wildlife breeding seasons including birds (May–July) and bats (March–October), or during rare plant flowering and seed development periods.

Cultural/Historic Resources

- If previously undiscovered archeological resources are discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the State Historic Preservation Officer and Tribal Historic Preservation Officers.

Alternative B

Under Alternative B, some trails would be modified to improve visitor safety and enhance trail sustainability. Trail reroutes due to the presence of sensitive plant species would be considered under this alternative. Additionally, one trail segment would be made universally accessible.

Actions under this alternative would include the following:

- Hiking and walking would continue to be allowed on Tyler Bend area trails.
- A 0.5 mile section of the River View Trail would be modified to be wheelchair accessible from the parking lot to the observation deck.
- A portion of the River View Trail below the observation viewing deck would be closed, and a sweeping switchback trail down to the Return Trail would be constructed to eliminate serious erosion issues with the River View Trail as it runs down the ridge crest.
- One 0.40 mile section of the Spring Hollow Trail would be rerouted to the other side of a drainage, to avoid trail loss due to a sizeable head cut that has been eroding the existing trail.
- The Buck Ridge Bridge that crosses a drainage on the existing Spring Hollow Trail would be removed and relocated to the new rerouted section of the Spring Hollow Trail.
- The construction of the Spur Trail connecting the campgrounds to the River View Trail would consist of mowing a trail, approximately 24–36 inches wide, through an agriculture field.
- Signage would be updated to include new Spur Trail.

Trail modifications could involve:

- Bench cutting in specific areas to reduce slope of trail and prevent loss of tread due to erosion and/or use in several places. Bench cutting requires cutting a section of tread across the side of a hill creating a narrow bench upon which the trail tread sits.
- Rock armoring to improve drainage. Rock armoring uses large flat rocks to pave a section of trail to prevent erosion, improve drainage, and helps to prevent user-induced erosion issues.
- Installing sweeping switchbacks or modifying existing switchbacks to replace a sharp apex with a more rounded apex to reduce trail erosion and increase safety for all visitors on the trails.
- Rerouting short sections (150–350 foot trail sections) to improve safety for hikers and to improve sustainability of the trail.

In areas where the trails are modified, NPS would work to keep trails slightly out sloped (trail tread that is lower on the outside or downhill side of the trail than it is on the inside or bankside) and would avoid long grades where possible to minimize erosion. Rolling drain dips and grade reversals would also be used to remove water from the trail tread as rapidly as possible, increasing sustainability and decreasing sediment discharge. Newly constructed trails would vary in tread width between 28 to 36 inches, with trail grade ranging from less than 2% up to 7% slope. Most of the modifications that could occur would be carried out using hand tools such as shovels, pick mattocks, pulaskis, and wheel-barrows. Where reroutes occur, a motorized excavator may be used if other environmental factors allow for its use.

Trail modifications would be conducted and maintained in accordance with NPS Trail Guidelines, NPS Guide to Sustainable Mountain Trails (2007). No bicycle use would be allowed under Alternative B.



Image: Stairs and bridge on lower segment of River View Trail.



Image:

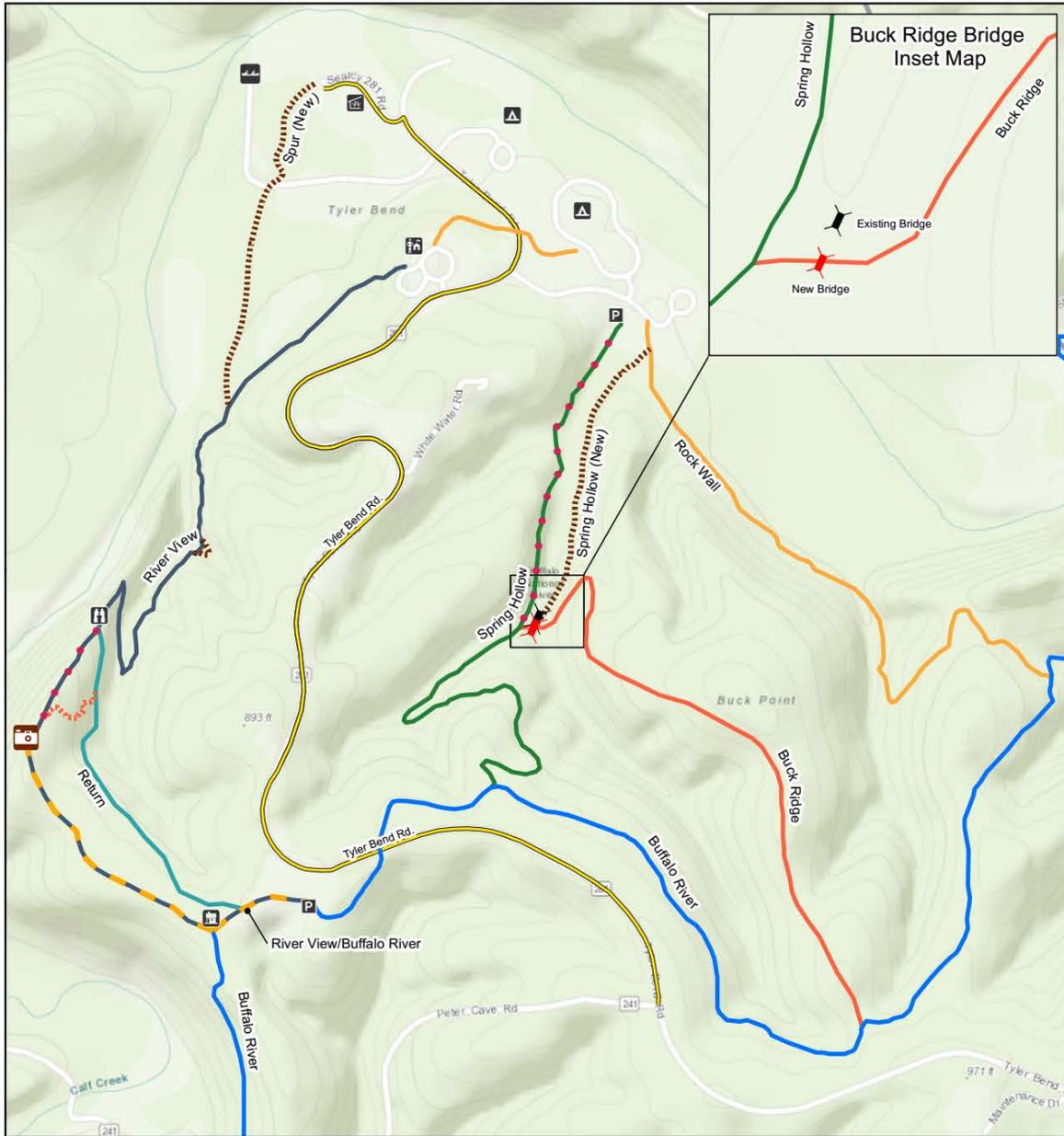
Trail to Sod Collier Homestead from parking area.



Image: Sign at Spring Hollow trailhead.

**Buffalo National River
Tyler Bend Trails - Proposed Trail Modifications Alternative B
Arkansas**

National Park Service
U.S. Department of the Interior



- | | | | |
|-----------------------|-------------------------------------|------------------------------|------------------|
| Current Trails | Proposed Trail Modifications | Buck Ridge Bridge (Existing) | Canoe Access |
| Buck Ridge | New Segment | Buck Ridge Bridge (New) | Parking |
| Buffalo River | New Switchback | Tyler Bend Rd. | Pavilion |
| Return | Eliminate Trail | Overlook Deck | Homestead |
| River View | Make Wheelchair Accessible | Park Places | Visitor Center |
| Rock Wall | | Campground | Wildlife Viewing |
| Spring Hollow | | | |



Datum: NAD83 15N UTM
ESG/Jan 2018

Alternative C (Agency preferred alternative)

Under Alternative C, some trails in Tyler Bend area would be modified to make the existing hiking trails multi-use for mountain bike use and hiking, while ensuring visitor safety and enhancing trail sustainability. Trail reroutes and new trail construction under Alternative C would be the same as those proposed under Alternative B.

Actions under this alternative would include the following in addition to those described under Alternative B:

- Allow mountain biking on 6.5 miles of the Buffalo River (2.2 miles), River View (0.9 mile), Return (0.4 mile), Spring Hollow (0.9 mile), Buck Ridge (0.8 mile), Rock Wall (0.9 mile), and new Spur (0.4 mile) trails in the Tyler Bend area.
- Mountain biking would be limited to:
 - The Buffalo River Trail from Calf Creek Road, through the Sod Collier Homestead parking area, to the intersection with Highway 65; and
 - The Return Trail and the lower half of the River View Trail from the Sod Collier Homestead parking area to the Tyler Bend visitor center (does not include the upper half of the River View Trail from the homestead to the first overlook); and
 - The full length of the Spring Hollow, Buck Ridge, and Rock Wall trails.
 - Bikes would continue to be allowed on the roads in the campgrounds, boat launch, and visitor center areas. Bikes are also allowed on Calf Creek Road and Highway 65.
- Signage would be updated to include the new Spur Trail, allowable uses of trails, and International Mountain Biking Association Trail Difficulty Ratings (where appropriate).
- Visitors choosing to mountain bike on the trails would be directed to use existing parking areas at the Sod Collier Homestead, visitor center, and campgrounds.

In addition to the trail modifications proposed above and under Alternative B, trail modifications for Alternative C could also include:

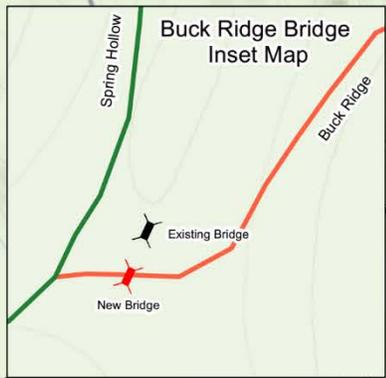
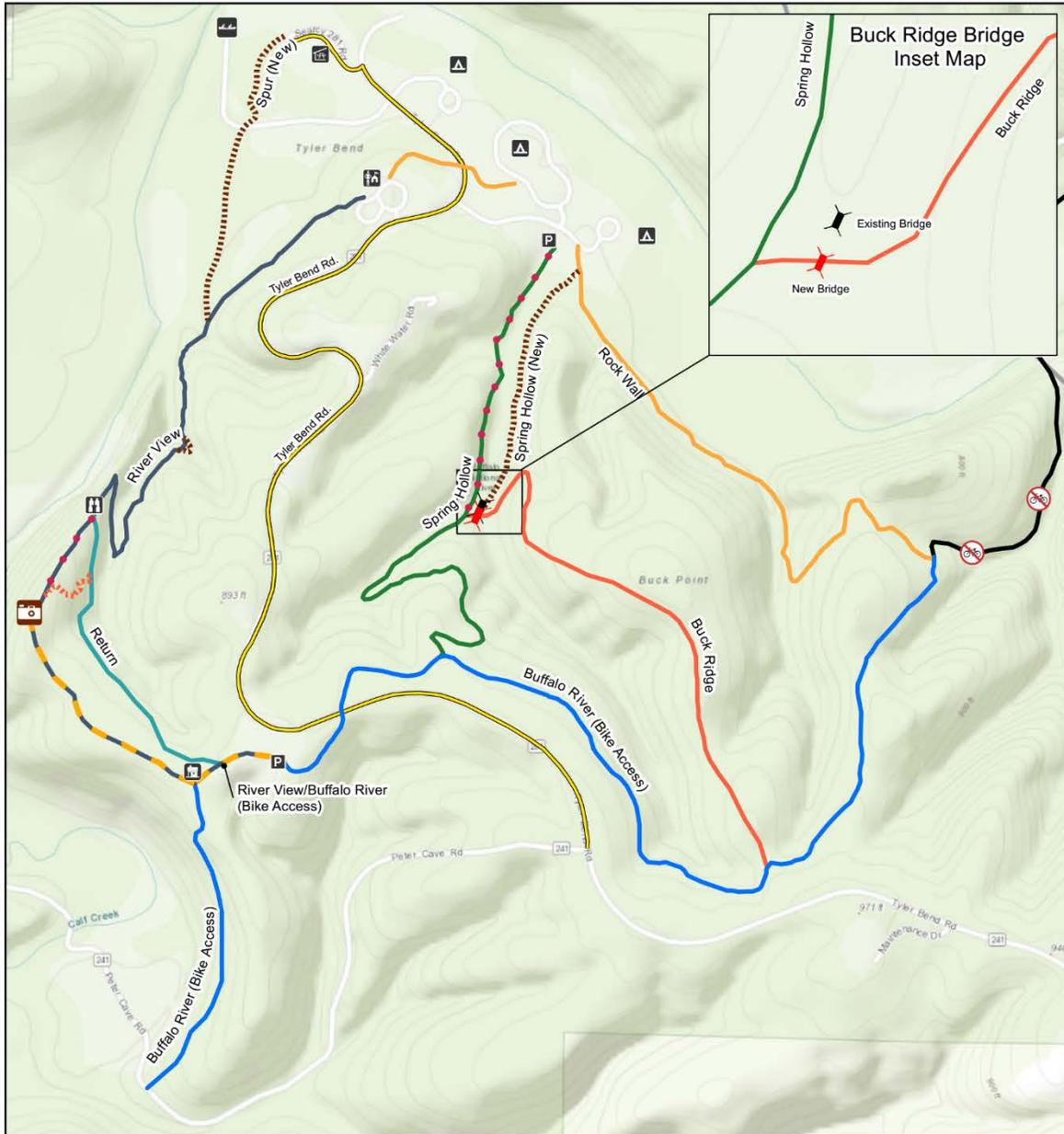
- Widening the trail in places to accommodate both hikers and cyclists on the trails.
- Rerouting short sections (150 to 350-foot trail sections) to improve safety for hikers and cyclists, and to improve sustainability of the trail.
- Removing large rocks within the trail to improve the riding experience and enhance the safety of trails by eliminating numerous slip-trip-fall hazards.
- Improving approaches to stream crossings and bridges. The existing approaches are very sharp and abrupt which may not be suitable to mountain biking. These approaches would be widened and their apex would be rounded.

In areas where the trails are modified, NPS would keep trails slightly out sloped (trail tread that is lower on the outside or downhill side of the trail than on the inside or bankside) and would avoid long grades where possible, to minimize erosion. Rolling drain dips and grade reversals would also be used to remove water from the trail tread as rapidly as possible, thereby increasing sustainability and decreasing sediment discharge. Newly constructed trails would vary in tread width between 28 inches to 36 inches, with trail grade ranging from less than 2% up to 7% slope. Most of the modifications that could occur would be carried out using hand tools such as shovels, pick mattocks, pulaskis, and wheel-barrows. Where reroutes occur, a motorized excavator may be used if other environmental factors allow for its use.

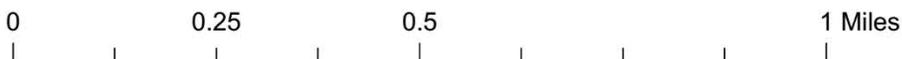
Trail modifications would be conducted and maintained in accordance with NPS Trail Guidelines, NPS Guide to Sustainable Mountain Trails (2007), and Construction and Maintenance and the International Mountain Biking Association's (IMBA) Trail Building Basics booklet.

**Buffalo National River
Tyler Bend Trails - Proposed Trail Modifications Alternative C
Arkansas**

National Park Service
U.S. Department of the Interior



- | | | | |
|--------------------------------|-------------------------------------|------------------------------|------------------|
| Current Trails | Proposed Trail Modifications | Buck Ridge Bridge (Existing) | Canoe Access |
| Buck Ridge | New Segment | Buck Ridge Bridge (New) | Parking |
| Buffalo River (Bike Access) | New Switchback | Tyler Bend Rd. | Pavillion |
| Buffalo River (No Bike Access) | Eliminate Trail | Overlook Deck | Homestead |
| Return | Make Wheelchair Accessible | Park Places | Visitor Center |
| River View | | Campground | Wildlife Viewing |
| Rock Wall | | | |
| Spring Hollow | | | |



Datum: NAD83 15N UTM
ESG/Jan 2018

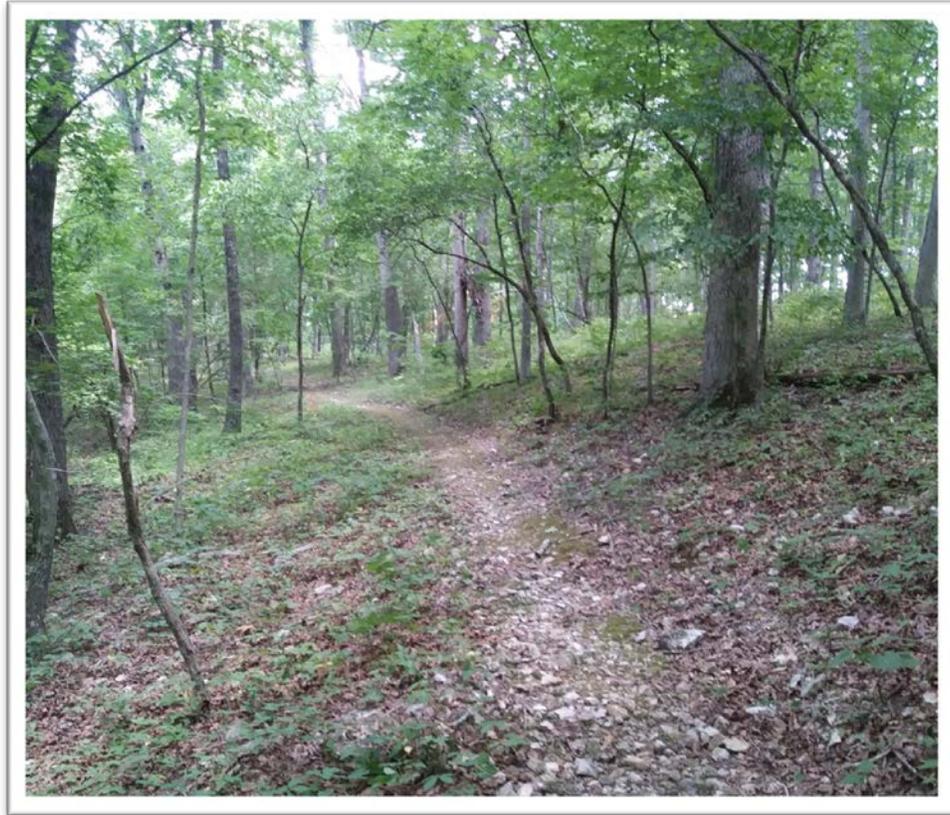


Image: Typical segment of the Buffalo River Trail in project area.



Image: Rock Wall Trail segment.

Alternatives Considered and Dismissed

The NPS considered multiple alternatives for project implementation; the following were dismissed from further analysis. These alternatives were determined not to meet park goals or the plan purpose and need, and were thus not analyzed in this EA. Descriptions of the dismissed alternatives and reasons for their dismissal are provided below.

Dismissed Alternative 1: NPS considered opening trails in other sections of the park to mountain biking. The NPS determined that this alternative would not be feasible at this time due to the possibilities of creating user conflicts with horseback riders, wilderness areas, and the need for the development of a park-wide trails management plan. The scope of this plan is limited to the Tyler Bend area.

Dismissed Alternative 2: NPS considered opening some of the trails of the Tyler Bend area to mountain biking without any trail modifications or reroutes. The NPS dismissed this alternative because of possibility of adverse impacts on natural resources and visitor experience.

Affected Environment and Environmental Consequences

This section describes the affected environment and environmental consequences within the project area as they relate to the implementation of the proposed alternatives as described in the Alternatives Chapter. This EA analyzes both beneficial and adverse impacts that could result from implementing the alternatives considered. This chapter is organized by the impact topics presented in the Purpose and Need for Action Chapter.

Methodology for Analyzing Impacts

In accordance with Council on Environmental Quality regulations, direct, indirect, and cumulative impacts are described (40 CFR §1502.16). General definitions for potential impacts are described as follows:

Direct: An effect that is caused by a proposed action and occurs in the same time and place of implementation (40 CFR §1508.8).

Indirect: An effect that is caused by a proposed action but is later in time or farther removed in distance from the action (40 CFR §1508.8).

Cumulative Impacts Analysis

As defined by NEPA regulations (40 CFR §1508.7), “Cumulative impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” Cumulative impacts are considered for all alternatives.

Cumulative impacts are determined by combining the impacts of the alternative with other past, present, and reasonably foreseeable future actions. However, the only past, present, or reasonably foreseeable future action identified in the project area for the Trails Plan is prescribed fire. Prescribed fire is not expected to have any long-term adverse impacts on the area, so there are no cumulative impacts when the incremental impact of any alternative is added to the effects of prescribed fire. There are only the direct and indirect impacts of the alternatives as described below.

Soils

Affected Environment

The project area lies within the Boston Mountain and Springfield Plateau areas of the Ozark Highlands physiographic area. The dominant soil types found in the project area are Noark, Clarksville, and Enders. Noark soils are deep, well drained, gently sloping to strongly sloping deposits located on ridges and hillsides. This soil ranges from very cherty (cryptocrystalline or monocrystalline silicates) silt to silty clay loam that formed in colluvium and clayey residuum from cherty limestones. Clarksville are very deep, somewhat excessively drained, and very cherty soils found on steep side slopes and narrow ridgetops. Clarksville soils formed in hillslope sediments and comprise the underlying clayey residuum from cherty dolomite or cherty limestone on steep side slopes and narrow ridgetops. They consist of very cherty silt loam to extremely cherty silty clay loam. The Enders soil type consists of deep, well drained, very slowly permeable soils that formed in residuum and colluvium derived from acid shale or interbedded shale and sandstone. Erosion hazard for these soil types are moderate to severe with the exception of Clarksville soils, which are severe (Table 1). The major recreation limit for these soils types appears to be the steepness of the terrain and the large amount of stones/rocks on the surface.

The existing Spring Hollow Trail—due to its placement directly adjacent to the stream, and the development of a head cut up slope from the trail—has experienced significant erosion in areas, and the trail has thinned out due to loss of soil.

TABLE 1. DOMINANT SOIL TYPES IN THE TYLER BEND TRAIL AREA

Soil Type	Permeability	Recreation Rating	Characteristic	Erosion Risk
Noark	Moderate	Severe	Small Stones, Slope	Moderate to Severe
Clarksville	Moderate	Severe	Small Stones, Slope	Severe
Enders	Moderate	Slight to Severe	Large Stones, Slope	Moderate to Severe

Unmodified soil trail treads are susceptible to a variety of impacts. Common impacts include soil compaction, erosion, muddiness, exposed tree roots, trail widening, uneven and rutted trail tread, and the proliferation of visitor-created side trails (Leung and Marion 1996; Thurston and Reader 2001, Marion and Olive 2006, Marion and Wimpey 2007; Marion et al. 2016). Compacted soils are denser and less permeable to water, which can result in higher levels of water runoff. Compacted soils typically reduce risks of erosion and soil displacement and can provide a durable tread that will support traffic from hikers and/or cyclists. Soil erosion is typically an avoidable impact of trails and trail use.

Impacts of Alternative A - No-action Alternative

Under this alternative, there would be no modifications to the recreational use of the trails in the Tyler Bend area, and they would remain hiking-only trails. Additionally, under this alternative, no physical modifications to the trails would occur. There would be no additional or increased impacts to soils anticipated under Alternative A; current trends would continue.

Soils may be disturbed through the possible development of social trails in the area. Social trails are unofficial trails created by hikers or cyclists traveling off the established trail. Creation and use of social trails would result in erosion and trampling of soils in the general area. Soils associated with the social trails would be adversely impacted as they erode and are carried to lower elevations by wind, storm events, and continued trail use.

Without any of the proposed trail modifications, the impact to soils would be negligible because no additional ground disturbance would occur (e.g., trail modifications); however, social trails could develop, causing increased soil erosion, loss, and compaction. This alternative would contribute a negligible amount of soil loss when combined with other ground-disturbing activities, including increased visits to the park and social trailing.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative B

Creation, modification, and use of trails would result in soil disturbance. While soil disturbance is difficult to avoid, much of the disturbance occurs during the initial construction or modification of the trail. During these modifications, organic materials such as leaves or twigs and organic soils would be removed from trail treads; trails built on sidehill locations would require some excavation which would further disturb or impact soils in the immediate project area. Careful trail design and specific modifications can eliminate many of the issues that lead to soil erosion (Marion and Wimpey 2007). If a trail tread erodes below the surrounding soil level, further erosion can be self-perpetuating and can restrict the diversion of water from the tread resulting in trail

muddiness. Trail muddiness can lead to users skirting muddy spots, soil compaction along the edges, widening mud holes and tread width, and braided trails that bypass muddy sections (Marion and Wimpey 2007). Modifications made to the existing trails to improve drainage, enhance safety of hikers, and reduce trail slope in areas would result in disturbance and loss of soils in specific areas where trail modifications occur (see Figure 1). The impact of these modifications on soils would be restricted to the immediate vicinity of the trail modification activity (approximately 150 to 350-foot segments) and would not be widespread throughout the Tyler Bend area. Trail modifications such as bench cutting, rock armoring, or tread widening would create a temporary soil erosion hazard; however, in the long-term, these modifications would serve to reduce this hazard. Trail modifications would be based on current NPS standards that would minimize soil exposure and movement during trail use. Construction activities associated with rerouting a 0.40-mile section of the Spring Hollow Trail and the relocation of the bridge crossing (100-foot distance) would not likely increase erosion and sediment flow into nearby drainages and streams, as the reroute would be in an area of less than 5% slope and separated from the stream. The proposed reroute and construction of a new trail would initially impact soils in the Spring Hollow Trail corridor more than impacts to soils under Alternative A, but these impacts would not result in long-term (extending to a period longer than construction activities may occur) increases in soil loss. Revegetation of the existing Spring Hollow Trail, once the new section is constructed, would reduce soil erosion impacts to the stream.

After trail work is complete, the results would be beneficial to soils because of reduced potential for continued erosion. The segment of the Spring Hollow Trail that would be rerouted would improve the condition of the trail, and the new placement would result in less soil loss over time due to better placement. The construction of this trail would follow NPS trail guidelines to reduce the risk to erosion and loss of soils once the trail has been established.

The construction of the Spur Trail connecting the campgrounds to the River View Trail would consist of mowing a trail, approximately 24–36 inches wide, through an agriculture field. This action is unlikely to increase the risk of erosion or loss of soils. The impacts of mowing and maintaining this trail would not result in adverse impacts to soils.

Cumulative Impact Analysis

One action that has taken place in the project area and will continue to be implemented in the foreseeable future is that the vegetation within three prescribed fire units located in the Tyler Bend area (794 acres) is burned on a rotating four-year schedule, with the goal of no two units burned in the same year. Several factors are evaluated before these areas are burned. Evaluation factors include the time of year, dead fuel moisture, and humidity on the day of the proposed fire, days since the last rain, and the expected intensity of the fire. If burning should coincide with trail modification activities, along with a significant rain afterwards, the combination of these conditions could create a small increase in soil erosion and a subsequent increase of sedimentation into nearby streams. These potential impacts would be expected to be temporary, with conditions lasting only until revegetation occurs.

Impacts of Alternative C

Under this alternative, impacts to soils associated with trail modifications would be similar to those described under Alternative B. The impacts of the additional recreational use allowed on the trails are unlikely to substantially add to the risks of exposed soils or more erosion; however, the degree of impact would depend on intensity of bicycle use.

Recreational activities like hiking and mountain biking can impact soil erosion and the stability of trail tread. Several studies evaluating the differences between recreational activity types have found that hiking and mountain biking have similar impacts to unsurfaced trails (Thurston and Reader 2001, Marion and Olive 2006). In a controlled experimental study, Thurston and Reader (2001) found that the impacts of hiking and

mountain biking on deciduous forest trails had no influence on soil exposure on trails. Other studies have evaluated the impacts on soils from mountain biking and hiking use and the majority indicate that the differences of impact to soils from hiking and mountain biking are statistically insignificant (Marion and Wimpey 2007). Several of the studies evaluating the impact on soils indicated that factors associated with trail alignment, slope, and soil type were more important than the type of use (hiking or mountain biking) when it comes to evaluating soil impacts (Wilson and Seney 1994, Marion and Olive 2006, White et al. 2006). They also found that the intensity of use influenced soil exposure risk more than the particular type of recreational activities (e.g., mountain biking or hiking).

Hiking and biking have been shown to have similar impacts on soils; however, soils may be more vulnerable to erosion or compaction under high-intensity use of the trails by cyclists (Marion and Wimpey 2007). If mountain biking becomes a popular activity, cycling could result in higher erosion, soil exposure, or compaction risks than would be anticipated with hiking-only trail use. While cycling could result in higher erosion or soil exposure; this may only occur under extreme use, and at a level unlikely to be observed within the Tyler Bend area. A 1998 study by Wohrstein evaluated the impacts from a mountain biking race with over 800 participants. Results indicated that erosion was found only on intensively used racing trails in steep terrain where alignments allowed higher water runoff (Marion and Wimpey 2007). Thus, under high-intensity biking conditions, soils may be impacted to a greater degree than at low-intensity use or hiking alone. Due to this potential, under extreme bike use, soils may be more adversely impacted under Alternative C. Impacts could include a greater loss of soil from the trails, increased muddiness, and greater potential for trail compaction. Soil erosion would likely degrade the quality of the trails and could lead to muddiness or braided trails; however, soil compaction may result in a more favorable trail tread for both bike and pedestrian use.

It is difficult to predict the intensity of use in advance for Tyler Bend; however, it is unlikely that allowing bicycle use on the trails in the Tyler Bend area would adversely impact soils significantly more than the impacts to soils occurring due to current hiking activities. Moreover, because factors such as trail alignment and slope can influence the impact to soils, many of the adverse impacts to soils could be reduced or mitigated with proper trail design. Under this alternative, the park would follow NPS trail guidelines and the International Mountain Biking Association's (IMBA) Trail Building Basics booklet to reduce the risk to erosion and loss of soils once the trail has been established.

Cumulative Impact Analysis

Cumulative impacts to soils under Alternative C would be the same as those described under Alternative B.

Special Status Species

Affected Environment

Under the Endangered Species Act (ESA), the NPS has the responsibility to address impacts to federally listed threatened or endangered species. National Park Service policy dictates that an assessment of impacts for federal candidate, proposed federal, and state-listed species occur during the NEPA process. For the purpose of this analysis, a list of federally and state-listed species was obtained from the following sources:

- 1) Federally listed species that may occur in or near the park from the U.S. Fish and Wildlife Service (USFWS) IPAC website (<http://ecos.fws.gov/ipac/>) on September 26, 2018
- 2) Park official species list from NPSpecies
- 3) State-listed and rare species that may occur in the project area from Arkansas Natural Heritage Commission (ANHC) on September 17, 2018.

Four mammal, two mussel, and eight plant species protected at the federal or state level, and three NPS sensitive species are known to occur or may occur in the project area. Of the fourteen species, seven are listed as either federally endangered or threatened. Four species are identified as species of greatest conservation need by the Arkansas Natural Heritage Commission (ANHC) because they have experienced long-term population declines and are vulnerable to degradation or environmental changes. Three species are considered sensitive species by the park due to their rarity, efforts for recovery, or protection from illegal harvesting.

Species which are not resident or breeding species, such as migratory birds were eliminated from analysis in this EA. The Buffalo River directly adjacent to the project area is designated critical habitat for the Threatened Rabbitsfoot mussel.

TABLE 2. FEDERAL AND STATE-LISTED ENDANGERED, THREATENED, SPECIES OF CONCERN KNOWN TO OCCUR, AND NPS SENSITIVE SPECIES WITHIN TYLER BEND TRAIL AREA OF BUFFALO NATIONAL RIVER

Species	Federal Status*	State Status*	NPS*
Mammals			
Gray Bat (<i>Myotis grisescens</i>)	E	E	S
Indiana Bat (<i>Myotis sodalis</i>)	E	E	S
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	T	E	S
Ozark Big-eared Bat (<i>Corynorhinus townsendii ingens</i>)	E	E	S
Clams			
Rabbitsfoot (<i>Quadrula cylindrica cylindrica</i>)	T	E	S
Snuffbox (<i>Epioblasma triquetra</i>)	E	E	S
Plants			
Missouri Bladderpod (<i>Physaria filiformis</i>)	T	T	-
Moore’s Larkspur (<i>Delphinium newtonianum</i>)	-	SGCN	S
Ozark Corn Salad (<i>Valerianella ozarkana</i>)	-	SGCN	S
Celandine Poppy (<i>Stylophorum diphyllum</i>)	-	SGCN	S
Showy Beardtongue (<i>Penstemon cobeia</i>)	-	SGCN	S
Bur Reed Sedge (<i>Carex sparganioides</i>)	-	SGCN	S
Ginseng (<i>Panax quinquefolius</i>)	-	-	S
Ozark Chinquapin (<i>Castanea pumila</i> var. <i>ozarkensis</i>)	-	-	S
Goldenseal (<i>Hydrastis canadensis</i>)	-	-	S
*E = endangered	T = threatened	SGCN = Species of Greatest Conservation Need	S = NPS Sensitive Species

Mammals

Gray Bat, Ozark Big-eared Bat—Both bat species primarily inhabit caves and mines year round (Harvey et al. 1999) and are known to occur in the project area. These bats are unlikely to be impacted by continued hiking, or by mountain biking, on the trails in the Tyler Bend area, as the trails are quite a distance away from any caves. These four species of bats could be impacted by human presence on the trails during foraging hours (dusk till dawn); although, it is likely they have habituated to the activity on the trails, and the use of the trails at night is expected to be very minimal by both hikers and mountain bikers.

Indiana Bat, Northern Long-eared Bat—Both bat species inhabit caves or mines during the winter months and use trees and tree bark for roosting and maternity colonies during the summer months (Harvey et al. 1999). Tree-roosting bat species often use large hollow trees that provide sufficient cavity space for maternity colonies, which may be as large as several hundred individuals (Harvey et al. 1999). While both species have been documented in the project area, it is unlikely that they would be impacted by continued hiking, or by mountain biking, on the trails in the Tyler Bend area. These three species of bats could be impacted by human presence on the trails during foraging hours (dusk and dawn); although, it is likely they are accustomed to the activities on the trails and the use of the trails at night is expected to be very minimal by both hikers and mountain bikers.

Clams

Rabbitsfoot---Small populations of the Rabbitsfoot mussel were historically known from near the White River up to the Pruitt area (Meek and Clark, 1912). More recent surveys indicate that this species extent in the Buffalo River is much less than it was in the past (Harris, 1996; Matthews et al., 2007). The trail maintenance and operation activities are expected to have no effect upon the species as none of the trails comes down to, or crosses the river, sediment discharge from the trails is not expected to increase, and there are no known occupied Rabbitsfoot mussel beds for many miles downstream of the project area.

Snuffbox---The Snuffbox mussel was a rare inhabitant in the Buffalo River 100+ years ago (Meek and Clark, 1912). This species has not been observed since that time. The location it was observed at historically is well downstream of the project area. The trail maintenance and operation activities are expected to have no effect upon the species as none of the trails comes down to, or cross the river, sediment discharge from the trails is not expected to increase, and there are no known occupied Snuffbox mussel beds in the Buffalo River.

Rabbitsfoot Critical Habitat---The project area is on the downstream end of Rabbitsfoot Critical Habitat unit RF-12 (USFWS, 2015). The project will have no impact upon this critical habitat, and there will be no adverse modification of the habitat.

Plants

Moore's Larkspur—Moore's Larkspur (*Delphinium newtonianum*) is a State listed species. This rare plant species inhabits rich mesic or dry-mesic forests in the Boston Mountains and Central Ouachita Mountains of Arkansas and is known to occur within the project area. One fairly large colony of Moore's Delphinium was known to be present in the Tyler Bend area based upon database records. Three additional colonies were discovered during the 2016 botanical survey. Two of the four colonies are likely to be adversely impacted by changes to the use of the trail. The conversion of the hiking trails to mountain biking is likely to have a direct or indirect adverse impact upon two colonies of this species. Direct impacts would occur in tread work. Indirect impacts would occur from off-trail excursions, whether planned or unplanned. Based upon the biology of this Ozarks endemic species, it seems likely that the impacts would be minor, adverse, and long-term.

Ozark Corn Salad—This species is a State listed plant with a small geographic range and grows in calcareous soils in open woods in Arkansas, Oklahoma, and Missouri. There are four documented colonies of Ozark Cornsalad (*Valerianella ozarkana*) in the Tyler Bend area and along the trail system. Two of these are likely to receive either direct or indirect impacts from converting the trails to allow for mountain biking. One of these is a large colony of thousands of plants which the trail passes right through. This is at the location of the proposed new trail from the Overlook trail to the return trail. The impacts from the project are likely to be adverse, minor, and long-term. To mitigate the potential impacts, it is necessary to eliminate the Overlook Trail and switchback to Return Trail from the mountain bike portion of the trail system.

Celandine Poppy—This species is a State listed perennial native to moist, semi-shaded bottomland forests in Arkansas and is valued for its yellow flowers. Celandine poppies are impacted by habitat fragmentation and some forest management practices (Southern Appalachian Species Viability Project 2002). The celandine poppy (*Stylophorum diphyllum*) is known from database records to be present near the trail system. It was not noted in the botanical survey of April 2016. Based upon the database records and the botanical survey, the project is not likely to have an adverse impact upon this species

Bur Reed Sedge—Bur Reed Sedge (*Carex sparganioides*) is listed by Arkansas Natural Heritage Commission (ANHC) as a species of greatest conservation need (SGCN). The species is known to occur in the Tyler Bend area. The known population is not located close to any of the existing or proposed trails. The Botanical survey completed in April of 2016 did not locate additional populations adjacent to the trails. Based upon review of database records and botanical survey, the project is not likely to have an adverse impact upon this species.

Showy Beardtongue—Showy Beardtongue (*Penstemon cobeia*) is a State listed plant known to be present in the Tyler Bend area from database records. The database indicates the species is present within 100' of a section of trail which will not be modified or open to mountain bikes. The botanical survey of 2016 did not locate any members of this species adjacent to the trail. Based upon the location of the known colony and the location of the trail, this project is unlikely to have an adverse impact upon this species.

Missouri Bladderpod—The Missouri Bladderpod (*Physaria filiformis*) is a federally listed Threatened plant species which is not known from Searcy County, Arkansas or the Buffalo National River. A botanical survey of the trail system was completed in 2016. No Missouri Bladderpod plants were discovered. The most likely location for the species would be along the Overlook Trail where glade habitat is well exposed. Despite numerous trips to this area in the early spring, park staffs, and botanists from outside agencies, universities, and organizations, have never located any members of this species in the project area, or Buffalo National River.

American Ginseng (Ginseng)—This species inhabits mesic hardwood forests with rich, moist soil under a closed canopy. Population sizes of this plant have declined considerably since European invasion, primarily because of extensive digging of its roots for commercial sale (NatureServe 2016). Two colonies of ginseng (*Panax quinquefolius*) are known to be adjacent to the trail system. One of these has the potential to be impacted by mountain bike usage. The expected impact for this species as a whole is adverse, negligible, and long-term. Ginseng is a park tracked species, and it is illegal to harvest ginseng at Buffalo National River. Ginseng is not tracked by Arkansas or USFWS.

Ozark Chinquapin— Ozark Chinquapin (*Castanea pumila* var. *ozarkensis* aka *Castanea ozarkensis*) is a member of the Chestnut family. At one time, this was a very important timber and mast producing tree in the Ozarks and Ouachitas. The tree once grew to heights of 65' with diameters of up to 3' (Ozark Chinquapin Foundation, 2018). The Chestnut blight (*Cryphonectria parasitica*) wiped out this species. Sprouts still come up from the root stock. A large sprout can grow up to 20' tall and 6-8" in diameter before it succumbs to the blight. There may be some root sprouts impacted by the trail system, particularly if new trail is constructed in areas where there are re-sprouts. Most commonly, this species can be found in dry upland deciduous or mixed

hardwood–pine communities (NatureServe 2016). This species is also vulnerable to habitat fragmentation and recreational development (NatureServe 2016). Impact to this population overall from this project is negligible. Individual plants may be lost, but there are hundreds of sprouts in the project area which will not be impacted.

Goldenseal--Goldenseal (*Hydrastis canadensis*) is a park tracked medicinal plant. There is one colony documented along the trail system. This colony is situated where it is likely to be impacted by mountain bike use. This species is widely distributed throughout the southern Ozarks. While the impacts to this one colony may be considered adverse, minor, and long-term, the impacts to the species as a whole are considered negligible.

Impacts of Alternative A

Impacts Common to All Species

Under this alternative, hiking would remain the only recreational activity allowed on the trails in the project area. The existence of social trails would adversely impact all plant species due to increased risk of trampling.

Ozark chinquapin is known to occur throughout the project area but is unlikely to be impacted by Alternative A. Ozark corn salad is unlikely to be impacted by Alternative A. There are some populations of this species that are known to occur within close proximity of the trails in the project area, and colonies of this species have responded favorably to habitat work, including prescribed fire, in the project area.

Other special status species would continue to respond to current activity and trail maintenance actions; however, no new impacts would occur.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative B

Trail modification activities associated with this alternative could potentially impact the sensitive plant species identified above. Bench cutting, rock armoring, and short reroutes of the trails could result in adverse impacts to colonies of the identified species if they occur within trail areas undergoing modification. Adverse effects are avoidable by rerouting away from these limited communities and sensitive species or habitats. Low-impact trail construction methods would be employed to avoid significant adverse impacts.

The proposed 0.8-mile reroute of the Spring Hollow Trail could impact both the bat species identified above due to the potential of vegetation alterations related to trail construction. Bat species, including the Indiana bat and Northern long-eared bat, could be adversely impacted if vegetation removed in trail construction activities is actively used as roosting or maternity habitat. Trail construction activity in this area will be done in the winter months (October 15 to March 15) to prevent impacts to these bats. The remaining bat species do not commonly use trees for roosting or rearing offspring; hence, no impacts to these species are anticipated under this alternative.

Sensitive plant species identified above could be impacted by vegetation removal during the construction of the new segment of new trail if these species occur within the trail alignment. Potential impacts are mostly avoidable by rerouting trail segments around these limited communities and sensitive species.

Overall, the NPS believes there would be no effect to Federally listed species under this alternative, and only minor or negligible effects to State listed species.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative C

Impacts to special status species under this alternative related to trail modifications or reroutes would primarily be the same as those described under Alternative B.

Under Alternative C, mountain biking would be added to the recreational uses allowed on certain trails within the Tyler Bend area. The impacts of mountain biking on wildlife have been evaluated to be similar to those of hikers (Marion and Wimpey 2007). Papouchis et al. (2001) and Taylor and Knight (2003) found that hikers and off-trail hikers were among the most disturbing to wildlife even though bikers have the ability to cover more ground in a given time period than hikers and could disturb more wildlife per unit of time. Adding mountain biking as an additional recreational activity allowed on the trails could impact sensitive plant species identified above due to risk of trampling, especially if bike traffic occurs along the edges of some trails within the project area. The intensity of the adverse impacts would be contingent on the colony size of trail-side sensitive plant species and the extent of trampling that could occur. These individual plant impacts would be unlikely to affect the species in the area as a whole.

Ginseng could conceivably have an increased risk of poaching due to the potential for heightened awareness of its location along some trails in the Tyler Bend area.

The addition of mountain biking will have no effect on the endangered gray bat, endangered Indiana bat, threatened northern long-eared bat, and the endangered Ozark big-eared bat because there are no known roosts within the project area. Additionally, bats are most active during the period from dusk to dawn which is not a popular time for cyclists to be on the trails.

Overall, the NPS believes there would be no effect to listed species under this alternative.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Visitor Use and Experience

Affected Environment

According to *Management Policies 2006*, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units (NPS 2006). The NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Furthermore, the NPS will provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. The NPS *Management Policies 2006* also state that scenic views and visual resources are considered highly-valued associated characteristics that the NPS should strive to protect.

Buffalo National River encompasses over 95,000 acres surrounding the free-flowing Buffalo River, and much of this land has been linked together by a network of trails accommodating both hiking and equestrian-based recreational activities. The park had more than 1.5 million visitors in 2017. The park currently has approximately 134 miles of trails that lead visitors to scenic vistas, historic places, and natural wonders. Currently, visitors who wish to explore the park by bicycle are limited to park roads and adjacent county roads. Throughout the park, bicycling is permitted on all park roadways unless otherwise posted or restricted due to seasonal closures.

Impacts of Alternative A

Under the no-action alternative, the trails would not be modified, would remain single use (hiking), and there would be no changes in visitor use and experience in the project area. The existing trails in the project area would continue to support current recreational activities like hiking, photography, picnicking, and camping. Under Alternative A, impacts to visitor use and experience would be the same as currently exist.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative B

Trail modifications could lead to temporary trail closures, which could adversely impact visitor use and experience. The proposed modifications would make the trails more resilient to hiking by stabilizing trail tread, reducing soil loss to erosion, and improving drainage. These modifications could ultimately result in enhanced visitor enjoyment due to trail improvements and trail stability. The new spur trail would be a benefit to visitors.

The River View Trail is one of the more popular trails in the area and often attracts large groups of visitors in its upper reach. This trail is a gentle and wide trail that passes by the historic Sod Collier Homestead and ends with a view of the river and Calf Creek below. Under this alternative, the trail would be modified, offering more accessibility to visitors wishing to experience this section of the park. Improving accessibility may enhance visitor use and enjoyment of this segment of the River View Trail.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative C

Under this alternative, impacts to visitor use and experience related to proposed trail modifications and reroutes would be the same as described under Alternative B, and mountain biking would be permitted on a segment of the Buffalo River Trail, the lower half of the River View Trail, and the Return, Spring Hollow, Buck Ridge, and Rock Wall Trails within the Tyler Bend area. Allowing biking would provide additional opportunities for visitor use and new visitor experiences within the Tyler Bend area. Many of the adjacent roads connect to the trails, so visitors wishing to ride bicycles could link multiuse trails to existing NPS and county roads for an extended riding experience within and adjacent to the park. Under this alternative there may be future opportunities for commercial services to serve visitors.

Allowing biking could increase the potential for congestion on the trails (and nearby roads), conflicts over who has the right of way (hiker or biker), and/or confusion over trail manners. All of these may adversely impact visitor use and enjoyment; however, most of these issues could be mitigated. Establishing rules of the trails, adding signs, and educating users on trail use guidelines would reduce the potential for hiker/biker conflicts. If it was found that conflicts could not be mitigated on certain trail segments, uses may be separated.

Cumulative Impact Analysis

There are no cumulative impacts identified that would impact visitor use and experience.

Human Health and Safety

Affected Environment

Promoting physical activity among children and adults is a priority national health objective in the United States (Troped 2011). Many studies have shown that regular physical activity lowers the risks of chronic diseases and is a critical component of addressing the obesity epidemic (Hill and Peters 1998, Booth et al. 2000, WHO and FAO 2003, Troped 2011). In a report issued in part by The Trust for America’s Health and the Robert Wood Johnson Foundation, The State of Obesity Report cites Arkansas as the state with the sixth highest adult obesity rate in the U.S., with 35% of adults presenting as obese (The State of Obesity Report 2016) and nearly 31% of adults and 20% of youth reporting no physical activity (CDC 2014). In the same report, Arkansas has the second highest rate of adult physical inactivity in the nation, with 34% of adults reporting no physical activity other than their regular job. The World Health Organization has estimated that worldwide, 1.9 million deaths annually are the result of physical inactivity, the equivalent of approximately 1 in 25 deaths (as cited in Barton and Pretty 2010).

In 2011, the NPS initiated a Healthy Parks Healthy People action plan that was intended to evaluate how the national parks can play an influential role in reversing the trend of poor health among citizens of the U.S. (Schmalz et al. 2013). The Active Trails Program was developed through the Healthy Parks Healthy People initiative in which the NPS has worked to provide funding to parks to promote healthy lifestyles, while simultaneously protecting and enhancing the land- and water-trail resources of the parks. Buffalo National River is a 2016 Active Trails “Explore for Health” grant recipient, and the funds were used to support activities ranging from scheduled hikes and river floats to “flexible opportunities” for groups who wish to visit the park to pursue their health and fitness goals.

Impacts of Alternative A

Under the no-action alternative, the trails in the project area would remain single-use hiking trails, and there would be no changes in human health and safety. The existing trails in the project area would continue to support and provide opportunities for physical activities like walking and hiking.

Cumulative Impact Analysis

No cumulative impacts have been identified for this no-action alternative.

Impacts of Alternative B

The proposed modifications would result in an improved trail system within the Tyler Bend Trail area. The proposed modifications would create a trail system that is resilient to long-term use and seasonal weather changes. Additionally, trails would be modified to improve the safety of hikers (e.g., leveling uneven trail tread) on the trails. Under Alternative B, visitors would benefit from safer trails that are more resilient to long-term use.

Alternative B would support park efforts to provide opportunities for physical activity, promote the Explore Outdoors program and the Iron Ranger program. This alternative also provides beneficial impacts to visitors of the park who wish to explore the Tyler Bend area and achieve their personal fitness goals.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative C

Modifying the use of the trails and allowing for mountain biking opportunities may adversely impact visitors by increasing the chance of injury on the trails. Due to the nature of the sport, there is an increased risk of injury on the trails, with the potential of severe injury if a biker is not using an appropriate helmet. The addition of biking on the trails may result in more visitors in the area and on the trails. Increased use of the trails could increase the risk of injury due to congestion and conflict between hikers and bicycles and/or collisions with other cyclists, hikers, or wildlife. The proposed modifications to the trails, such as widening the trails in areas, should reduce the chance of collisions with both types of users; although, no modification could totally eliminate this risk. Restricting bicycle use to daylight-only hours would reduce risk of wildlife collision.

There is a potential for adverse impacts, including risk of injury to visitors, by adding the recreational use of mountain biking on park trails. Visitors are expected to self-manage their risk, and the park would sign trails with their level of difficulty. Even so, some injuries are likely.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Operations and Maintenance

Affected Environment

Implementation of a project can affect the operations of a park. Examples include the number of employees needed; the type of duties that need to be conducted; who would conduct these duties; how activities should be conducted; and administrative procedures. Park operations and maintenance, for the purpose of this analysis, refer to the current staff available to adequately protect and preserve vital park resources and provide for an effective visitor experience. The discussion of impacts to park operations and maintenance focuses on 1) law enforcement and other staff available to ensure visitor and employee safety on the trails; and 2) the ability of the trail/maintenance crew to protect and preserve resources given current funding and staffing levels. Park staff knowledge was used to evaluate the impacts of each alternative and is based on the current description of park operations presented in the Purpose and Need section of this document.

Impacts of Alternative A

Under this alternative, there would be no change to park operations. Park staff would continue to patrol and maintain the project area as funding and staffing levels permit. Park trails would continue to be assessed and ranked in order of priority, and trail/maintenance crews would repair and maintain trails in accordance with the prioritized schedule.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

TABLE 3. COMPARISON OF PROPOSED ACTIONS FOR EACH ALTERNATIVE AND ESTIMATED COSTS

Proposed Action	Alternative A	Alternative B	Alternative C	Estimated Costs
Hiking and walking would continue to be allowed on Tyler Bend area trails.	X	X	X	NA
Modify a 0.5 mile section of the River View Trail to be wheelchair accessible.		X	X	\$55,000
300–400-ft reroute below the Overlook Deck on the River View Trail. Reroute would include continuing the trail as a switchback “S” sweeping into long smooth corners and then connection to the existing Return Trail.		X	X	\$3,300
Reroute 0.40 miles of the Spring Hollow Trail due to erosion issues.		X	X	\$5,000
Relocate the Buck Ridge Bridge crossing the Spring Hollow Trail bridge to the newly established Spring Hollow Trail.		X	X	\$15,000
Create new Spur Trail through agricultural permit field connecting the Tyler Bend area campgrounds to the River View Trail.		X	X	\$0
Trail modifications such as: benchwork, rock armoring, trail alignment, trail widening, tread smoothing, etc.		X	X	\$4,200
Additional modifications for mountain biking on the River View Trail			X	\$7,700
Update signs to include new Spur Trail		X	X	\$1,000
Update signs to indicate allowable uses on trails (may include additional signs).			X	\$2,500
Include information on trail signs such as the International Mountain Biking Association Trail Difficulty Ratings.			X	(included above)

Impacts of Alternative B

The proposals included in this alternative would require new funding and/or staffing to be completed. Mowing a new trail would add incrementally to maintenance duties in the area. Current staffing levels at the park are insufficient to complete the proposed trail modifications and reroutes under this alternative without additional support. The additional support could be supplied by project funding, grants, volunteer donations, volunteer labor, or several other means.

Cumulative Impact Analysis

Park trail/maintenance staff oversee the repair and maintenance of the trails in the Tyler Bend area and the park as a whole. Under this alternative, proposed trail modifications would temporarily increase park operations workload while modification actions are carried out. The anticipated increase in visitor use of the trails, along with the ongoing required maintenance of the trail system, could have minor to moderate impacts on the overall park operations workload.

Impacts of Alternative C

The change from single-use to multiuse trails in the Tyler Bend area could result in increased demands on park staff and available funds due to required management and maintenance of the trails, especially if use of the trails increases with biking. Allowing biking on certain trails would increase the need for monitoring and patrol to evaluate impacts and assure compliance with trail rules.

This alternative may provide opportunities for commercial services, such as bike tours or bike shuttle services, which could generate revenue. The change in recreational use of the trails could also strengthen relationships between the park and volunteers who may be interested in helping maintain trails. Strengthening partnerships would provide beneficial impacts to park staff and visitors. Table 5 shows lifecycle cost estimates for bike-specific elements of Alternative C.

TABLE 4. LIFE CYCLE MAINTENANCE COSTS AS REQUIRED BY 36 CFR 4.30*

Trail Segment	Distance (mi)	Annual Operations and Maintenance Cost	Construction Cost	Notes
Signage	n/a	\$500	\$2,500	New signage needed with new use opportunity.
Buffalo River Trail	2.2	\$500	\$500	Minimal modifications, rolling grade.
River View	0.9	\$1000	\$4,200	Extensive modifications needed.
Return	0.4	\$500	\$500	Minimal modifications needed.
Spur (new)	0.4	\$500	\$0	Mowed trail for the most part.
Spring Hollow	0.9	\$500	\$2,500	Some modifications needed.
Buck Ridge	0.8	\$500	\$1,000	Some modifications needed.
Rock Wall	0.9	\$500	\$700	Minimal modifications needed.
Totals	6.5	\$4,500	\$11,900	

*Note that these costs do not include reroutes or bridge repairs that would be common to all action alternatives; these are costs associated with making trails ready for mountain bike use.

The proposals included in this alternative would require new funding and/or staffing to be completed. Current staffing levels at the park are insufficient to complete the proposed trail modifications and reroutes under this alternative without additional support. The additional support could be supplied by project funding, grants, volunteer donations, volunteer labor, or several other means.

Cumulative Impact Analysis

Cumulative impacts under Alternative C would be the same as under Alternative B.

Environmentally Preferable Alternative and Agency Preferred Alternative

Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative “that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally

preferable alternative is identified upon consideration and weighing ... of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative.”

The environmentally preferable alternative is Alternative C. While trail improvement construction would have short-term impacts to the environment, the improvements to the trail system and increased use and volunteer maintenance and observation would be beneficial in the long term.

Agency Preferred Alternative

The agency-preferred alternative is Alternative C. The advantages to visitor experience outweigh the minimal impacts to the environment under this alternative.

Coordination and Consultation

As part of this planning process, the park has contacted the State Historic Preservation Officer, relevant state agencies, the U.S. Fish and Wildlife Service, and other parties. A partial list of the prominent stakeholders, partners, and other interested parties follows.

Public Involvement

Buffalo National River takes ongoing feedback regarding its trail network. Specifically, visitors ask questions of the rangers at the Tyler Bend visitor center, and frequently report back on their experiences. The park has also received multiple requests to allow mountain biking on park trails, in person and via letter, over the last several years. This ongoing feedback has informed development of the plan.

The draft plan and EA will be available for public review and comment. If alternative C is selected for implementation, a special rule will be promulgated, also involving a public review and comment period.

Tribes

Various laws, executive orders, and policies direct the National Park Service to consult with recognized Indian Tribes in the development of park management plans. The tribes Buffalo National River routinely consults with are:

- Absentee Shawnee
- Caddo Indian Tribe of Oklahoma
- Cherokee Nation of Oklahoma
- Eastern Shawnee Tribe of Oklahoma
- Osage Nation of Oklahoma
- Quapaw Tribe of Oklahoma
- The Shawnee Tribe
- Tunica-Biloxi Tribe
- United Keetoowah Band of Cherokee Indians in Oklahoma
- Wichita and Affiliated Tribes

These tribes will be consulted in regards to this environmental assessment.

U.S. Fish and Wildlife Service

A copy of this document will be provided to the U.S. Fish and Wildlife Service. The park has determined that the actions described in this environmental assessment will have no effect on listed species.

State Historic Preservation Officer

No adverse effects to historic properties are expected based on the actions called for in this environmental assessment. A copy of this draft environmental assessment will be forwarded to the State Historic Preservation Office along with a request for concurrence.

List of Recipients for this Environmental Assessment

FEDERAL AGENCIES/ORGANIZATIONS

- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service, Arkansas Field Office
- Arkansas Congressional Delegation

AMERICAN INDIAN TRIBES

- Absentee Shawnee
- Caddo Indian Tribe of Oklahoma
- Cherokee Nation of Oklahoma
- Eastern Shawnee Tribe of Oklahoma
- Osage Nation of Oklahoma
- Quapaw Tribe of Oklahoma
- The Shawnee Tribe
- Tunica-Biloxi Tribe
- United Keetoowah Band of Cherokee Indians in Oklahoma
- Wichita and Affiliated Tribes

STATE AGENCIES/ORGANIZATIONS

- Arkansas Department of Health
- Arkansas Highway and Transportation Department
- Arkansas Division of Commerce, Travel and Tourism
- Arkansas Natural Resources Commission
- Arkansas Natural Heritage Commission
- Arkansas State Historic Preservation Officer
- Arkansas State Historical Society
- Office of the Governor
- State Legislators in the project area

OTHER AGENCIES AND ORGANIZATIONS

- National Parks and Conservation Association
- Searcy County Judge
- Mayor and City Councils in the project area

OTHER ENTITIES

- Adjacent Landowners
- Buffalo National River Advisory Committee
- Requesting Members of the Public

Planning Team Participants and Document Preparers

The key members in developing this management plan/environmental assessment included:

Mark Foust, Superintendent, Buffalo National River

Kevin Cheri, Superintendent (retired)

Laura Miller, Deputy Superintendent (former)

Dr. Caven Clark, Interpretation and Resources Division Chief

Chuck Bitting, Natural Resource Program Manager

Suika Rivett, Archeologist

Jesse Morris, Facility Management Division Chief

Tokey Boswell, Planning and Compliance Division Chief, Midwest Regional Office

Scott Blackburn, Regional Environmental Coordinator, Midwest Regional Office

Erin Greenlee, Ph.D., Natural Resource Project Manager, Ecosystem Management, Inc. (project consultant)



Image: Trail sign in the project area.

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Glossary

Bench Cut: Bench cutting requires cutting a section of tread across the side of a hill, creating a narrow bench upon which the trail tread sits.

Out Slope Trail: An outsloped tread is one that is lower on the outside or downhill side of the trail than it is on the inside or bankside. Outsloping lets water sheet across the trail naturally. The tread should be outsloped at least 5%.

Rock Armoring: Rock armoring uses large flat rocks to pave a section of trail to prevent erosion, improve drainage, and helps to prevent user-induced erosion issues.

Tread: The portion of the corridor upon which the users travel; tread is designed to accommodate the focused impact of its users.