National Park Service
U.S. Department of the Interior
Buffalo National River
Harrison, Arkansas

Lost Valley Trail & Campground
Environmental Assessment

April 2013

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Summary

Buffalo National River (BNR) proposes improvements to the Lost Valley Trail (Lost Valley) to enhance visitor safety and to ensure compliance with standards set by the Architectural Barriers Act (ABA) for outdoor developed areas. ABA standards apply to federal land management agencies and are consistent with those of the Americans with Disabilities Act (ADA).

At Lost Valley, the National Park Service (NPS) proposes to install a new pedestrian bridge over Clark Creek and realign and upgrade the first 720 feet of the trail from the new bridge to make them barrier-free. Also proposed is the permanent closure of the campground at Lost Valley and upgrading the amphitheater to make it barrier-free. Trail upgrades beyond the first 720 feet to make it barrier-free were approved in 2011 and are already completed.

This environmental assessment (EA) evaluates two alternatives: a no-action alternative and an action alternative. The no-action alternative describes the current condition if the trail is left where it is, no new bridge is installed, and the campground is reopened. The action alternative comprises the improvements described above.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and effects to BNR's resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these effects. Resource topics included in this document because the resultant effects may be greater-than-minor include soils; vegetation; special status species; and visitor use and experience. All other resource topics were dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this project. Public scoping was conducted to assist with the development of this document and comments were received, mostly in support of the proposed project.

Public Comment

If you wish to comment on the EA, you may post comments online at http://parkplanning.nps.gov/buff or mail comments to: Superintendent; Buffalo National River, Lost Valley Trail Improvements EA, 402 N. Walnut Street, Harrison, Arkansas 72601.

This EA will be available for public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, 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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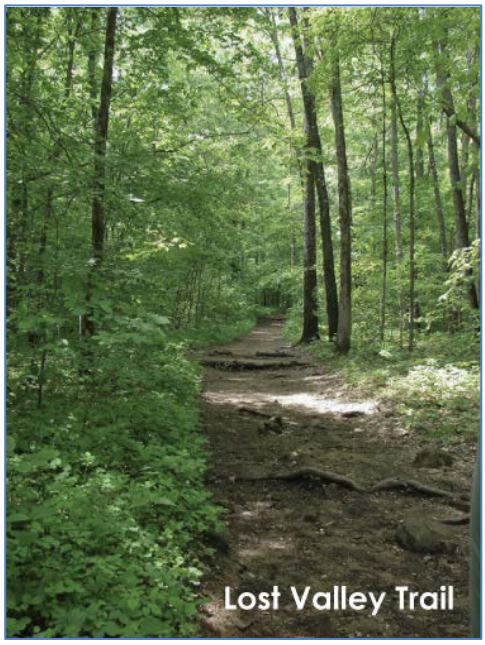
Introduction



Buffalo National River (BNR) is located in Newton, Searcy, and Marion Counties in northern Arkansas. Lost Valley Trail is located in Newton County, 22-miles west of Harrison, Arkansas (Figure 1). The administrative headquarters are located in Harrison, Arkansas. Containing 95,730 acres, BNR was established by Public Law 92-237 on March 1, 1972 and is managed by the National Park Service (NPS). 16 United States Code (USC) § 460m-8 states the purpose of establishment: "….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 in Arkansas for the benefit and enjoyment of present and future generations….". 16 USC § 460m-12 further directs: "The Secretary shall administer, protect, and develop BNR in accordance with the provisions of sections 1, 2, 3, and 4 of this title, as amended and supplemented; except that any other statutory authority available to the Secretary for the conservation and management of natural resources may be utilized to the extent he finds such authority will further the purposes of this subchapter." Management decisions for BNR are based in part on the 1977 Final Master Plan and in part on the 2000 Resource Management Plan (RMP) for BNR, Arkansas.

The purpose of this environmental assessment (EA) is to examine the environmental effects associated with the proposal to construct barrier-free improvements to and realign the initial portion of the trail, repair flood damage to facilities, and permanently close the campground at Lost Valley Trail, located within BNR. The scope of this EA is limited to the improvements described in the proposed action. The following regulations and guidance documents guide the planning and completion of the projects proposed in the EA:

National Park Service Director's Order (DO) – 12 (*Conservation Planning, Environmental Impact Analysis, and Decision-Making*) – DO-12 is the NPS guidance for Conservation Planning, Environmental Impact Analysis, and Decision Making. DO-12 states the guidelines for implementing NEPA according to NPS regulations. DO-12 meets all Council on Environmental Quality (CEQ) regulations for implementing NEPA. In some cases, the NPS has added requirements under DO-12 that exceed the CEQ regulations.

National Environmental Policy Act (NEPA) of 1969, **regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9)** – The purpose of NEPA is to encourage productive and enjoyable harmony between humans and the environment; to promote efforts which will prevent or eliminate damage to the environment and stimulate the health and welfare of humankind; and to enrich the understanding of the ecological systems and natural resources important to the Nation. NEPA requirements are satisfied by completion of a Categorical Exclusion (CE), EA, Environmental Impact Statement (EIS), or a memo to the files documenting existing NEPA compliance that covers the current proposed activity. In the case of an EA or EIS, NEPA requirements are met by successful completion of the document and an accompanying decision document.

Department of the Interior, Office of the Secretary, Implementation of NEPA (40 CFR § 46) – On October 15, 2008 the Department of the Interior (DOI) published its final rule, which amended its regulations by adding a new part to codify its procedures for implementing NEPA. The Department believes that this action will provide greater visibility to the guidance that was previously contained in the Department Manual (DM) and enhance cooperative conservation by highlighting opportunities for public engagement and input in the NEPA process. This rule offers clarification on protection and enhancement of environmental quality, initiating the NEPA process, and preparing EAs and EISs.

The following laws, regulations, and executive orders may be applicable to the proposed action analyzed in this EA:

- **Clean Water Act/Regulations** – provides national recommended ambient water quality criteria and calls for no degradation of the nation's surface waters.
- **Arkansas Water Quality Regulations** – conserve waters of the State to protect, maintain, and improve water quality.
- **Safe Drinking Water Act (SDWA)** – The SDWA authorizes the Environmental Protection Agency (EPA) to set maximum contaminant levels (MCLs) for dangerous chemicals, waterborne bacteria, and viruses in the public's drinking water.
- **Executive Order 11990** – provides for the protection of wetlands.
- **Executive Order 11988** – provides for the protection of floodplains.
- **Clean Water Act and Section 404 Regulations** – provides for the protection of wetlands and waters of the United States.
- **Endangered Species Act/Section 7** – provides for the listing and protection of endangered and threatened species and their critical habitat; requires consultation under Section 7 if any listed species may be adversely affected.
- **National Historic Preservation Act (NHPA)/Section 106** – provides for the identification and protection of historic sites and structures.
- **Archeological Resource Protection Act** – provides for the protection of archeological resources on public lands.
- **Executive Order 13007** – provides for protection of Indian sacred sites.
- **NPS Director's Order #28, Cultural Resource Management Guidelines (1998b)** – defines how the NPS will protect and manage cultural resources on NPS lands in accordance with the NPS Management Policies.

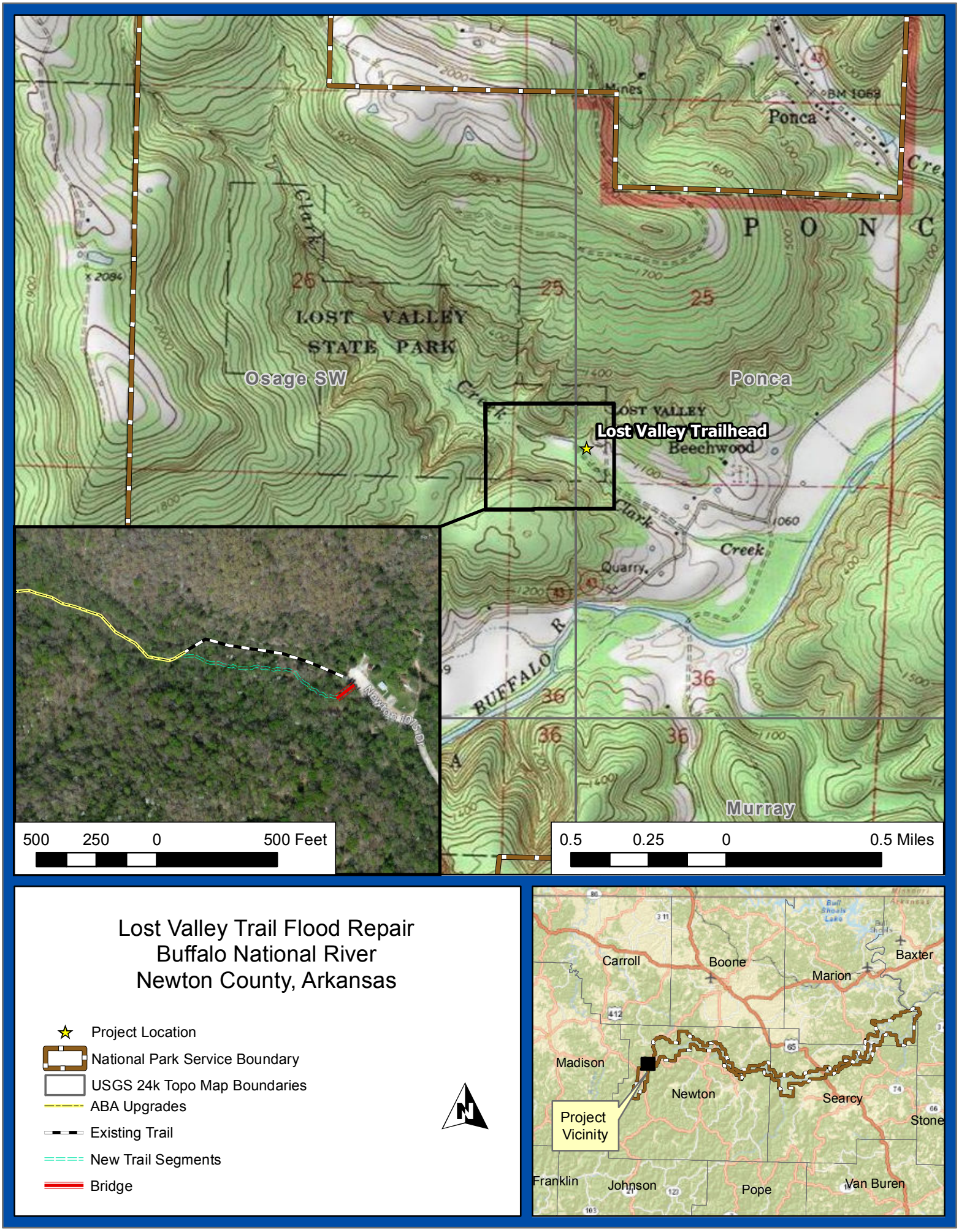


Figure 1: Location of the Proposed Lost Valley Trail Flood Repair Project.

Parametrix

- **Federal Cave Resource Protection Act (1988)** – requires federal land managers to consider impacts of management activities on resources present in significant caves. NPS determined that all caves in National Park units are significant under the law.
- **Architectural Barriers Act (2004)** – these standards apply to federal land management agencies and are consistent with those if the ADA. The Accessibility Guidelines for Outdoor Developed Areas provide accessibility standards for facilities not addressed in the ADA-ABA Accessibility Guidelines, including trails, campgrounds, picnic areas, viewing areas and beach access routes.

Background

The Lost Valley Trail is located near the western, upstream end of BNR (Figure 1). Based on traffic counter data, it is the most heavily used trail at BNR with approximately 64,000 visitors per year. Peak visitation occurs during the spring and fall seasons. All age groups, from toddlers to the elderly, are frequently seen walking on this trail. Some are experienced hikers in good shape and wearing sturdy footwear while others struggle with the steep, rugged sections of the trail and/or are seen wearing loose sandals. It is not uncommon to see infants in strollers or in specially designed carriers or backpacks along the trail.

This frontcountry trail starts at the popular Lost Valley Campground in the scenic Boxley Valley Historic District. This campground has been closed since 2011 due to damage from flooding, but the trail is still open for day use. The trail is approximately one mile long and follows the course of Clark Creek to Eden Falls, terminating at Eden Falls Cave. The trail winds its way through a mature hardwood forest with a notable population of beech trees scattered throughout. There is a small, rustic “amphitheater” located near the beginning of the trail. There are a number of social trails that lead from the trail over to Clark Creek between the trailhead and Eden Falls. The trail over the first 0.7 miles to the natural bridge is moderately sloped. The short segment from Eden Falls to Eden Falls Cave is steep, narrow, slippery when wet, and exposed to 30 foot drops or more in some places. New stone steps and rails were installed on this segment over the last year, which substantially improved safety. A portion of the trail, up to the fork that divides the trail into high and low routes to the falls, was upgraded to make it barrier-free during the summer of 2012. This portion did not include the first 720 feet of trail from the parking lot because this segment is located within the 100-year floodplain of Clark Creek and needs to be relocated.


Washed Out Trail


Washed Out Bridge

In April 2011, Clark Creek flooded and washed out the trail bridge at the trailhead, scoured the trail, and

created a number of unsafe areas. After the damage was assessed the NPS determined that additional improvements were necessary, including trail bridge replacement, trail realignment, and permanent closure of the campground.

Purpose and Need

The purpose of the proposal is to provide a safe and functional environment for BNR visitors in compliance with the goals and objectives of current plans and policy, which include keeping long-term potential maintenance costs to a minimum. The project is needed to accomplish the following objectives:

- Improve the safety and accessibility of the Lost Valley Trail by making a portion of the trail near the parking lot, amphitheater, and along the first 720 feet of the main trunk of the creek accessible to the mobility impaired without causing an impairment of the resource.
- Repair 2011 flood damage by replacing the trail bridge over Clark Creek, realigning low-lying sections of the trail outside of the 100-year flood zone, and permanently closing the campground to eliminate danger from future flash flood events.

Relationship to Other Plans and Policies

Current plans and policy that pertain to this proposal include the *2000 BNR Resource Management Plan* (NPS 2000) and the *Management Policies 2006* (NPS 2006). Following is more information on how this proposal meets the goals and objectives of these plans and policies:

- This project is fully consistent with the goals and objectives of the 2000 BNR *Resource Management Plan*, which does not prohibit any of the improvements described in the proposed action.
- The proposal is consistent with the goals and objectives of the 2006 National Park Service *Management Policies* (Management Policies 2006) that state that major park facilities within park boundaries should be located so as to minimize effects to park resources. The proposed site already exists and the project only involves modifications to improve safety and accessibility.

Scoping

Scoping is a process that helps to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse effects. BNR conducted internal scoping with appropriate NPS staff, as described in more detail in the *Consultation and Coordination* chapter. BNR also conducted external scoping with the public, interested/affected groups, and Native American tribes.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to improve the Lost Valley Trail and to generate input for the preparation of this EA. The scoping letter dated September 6, 2012 was mailed out to over 200 residents, elected officials, private organizations, and public agencies in the northern Arkansas region, including landowners adjacent to the river. In addition, a scoping letter was mailed to affiliated Native American tribes, local governments, and local news organizations. Scoping information was also posted on the NPS Planning, Environment and Public Comment (PEPC) website.

During the 30-day scoping period, which was extended to October 20, 2012, three public responses were received. One comment focused on the importance of minimizing the impact of trail construction on spring wildflowers during realignment of the Lost Valley Trail. The remaining two responses opposed permanent closure of the campground and one of those suggested moving the campground to one of the open hayfields nearby, outside of the floodplain. In addition, during tribal consultation, no Native American tribes responded to the scoping letters. More information regarding external scoping and Native American consultation can be found in *Comments and Coordination*.

ALTERNATIVES

Since early 2011, an interdisciplinary team of NPS employees has been discussing the proposed project alternatives. These discussions led to the definition of project objectives as described in the *Purpose and Need,* and a list of alternatives that could potentially meet these objectives. One action alternative and the no-action alternative were originally identified for this project. No other action alternatives were considered for reasons described later in this chapter. One action alternative and the no-action alternative are carried forward for further evaluation in this environmental assessment. A summary table comparing alternative components is presented at the end of this chapter.

Alternatives Carried Forward

Alternative A – No-Action

Under this alternative, almost none of the improvements described in the action alternative would be constructed. The portion of Lost Valley Trail that lies within the 100-year floodplain of Clark Creek would remain as is with only basic trail maintenance carried out from time to time to maintain its present condition or possibly to remove safety hazards such as rocks and roots, and secure loose stone steps. The segment of the trail from the fork at the high and low routes to the point where the old trail alignment drops down into the floodplain would continue to be maintained as barrier-free, for which NEPA compliance was completed in the Facilities Improvements EA and Finding of No Significant Impact (FONSI), signed by NPS in 2010. The bridge over Clark Creek would not be replaced and visitors would continue to use the old low-water crossing at the upper end of the parking lot. In addition, the campground would not be permanently closed and if re-opened would remain a hazard during flood events. Should the no-action alternative be selected, the NPS would respond to future needs and conditions of these facilities without major actions or changes in the present course of action.

Alternative B – Construct Trail Improvements and Permanently Close Campground

This alternative consists of relocating and upgrading the Lost Valley Trail segment from the parking lot to the point where the trail exits the 100-year floodplain and permanently closing the campground. The following text further describes the components of Alternative B:


Typical Bridge Design

- **Planned Improvements** – A new trail bridge would be constructed over Clark Creek to replace the structure that was irreparably damaged in the April 2011 flood event. This new bridge would be mounted on concrete pads set back from the edge of the creek embankment and out of the channel. Construction of the concrete pads would require excavation of a rectangular hole to a depth of six feet that is six feet wide and eight feet long at the bottom, and with the top two feet sloped back at a 1:1 ratio, or 45 degree angle. The bridge span would be approximately 70 feet long. The bridge would be located near the upper end of the parking lot. Figure 1 shows the proposed location of the bridge.

Soil excavated for the concrete bridge pads would be hauled off-site and stored for use elsewhere in the park. Storage would be in conformance with standard park practices to prevent it from being washed into nearby drainages during storm events.

Beginning at the new bridge and extending for a distance of approximately 720 feet, the lower trail would be relocated and upgraded to make it barrier-free with standards set by the ABA. These standards include a trail width of 5 feet and grades no greater than 12.5 percent for a distance no greater than 10 feet, 10 percent for a distance no greater than 30 feet, and 8.3 percent for 200 feet. For distances over 200 feet the grade would be no greater than 5.0 percent.

To make the trail surface barrier-free, BNR would use a commercially available soil stabilizer. This stabilizer would be mixed with a crushed aggregate base course to provide a solid, relatively smooth surface. The color of the crushed aggregate would be matched to the surrounding soil by adding a colorant to the soil stabilizer to more closely match the surrounding environment. BNR would use the same stabilizers, aggregates, and colorants used for the upgrades that have already been completed. The existing amphitheater located near the beginning of the trail would also be upgraded to make it barrier-free. A comprehensive description of the ABA standards for trails can be found at: http://www.access-board.gov/ada-aba/final.cfm.


Typical Drainage Crossing Design

The Lost Valley Trail would be re-located outside of the 100-year floodplain. Relocation of the trail out of the floodplain would require removal of vegetation at ground level and some stump and root removal along the new route. The abandoned trail segment would be allowed to naturally revegetate over time.

Drainage crossings would be improved by installing buried pipes or handmade stone culverts. If buried pipes are used, they would be effectively covered and hidden from sight to maintain the appearance of the natural setting.

The campground at Lost Valley Trail would be closed permanently and the area would be restored to pre-development conditions. The barrier-free campsite near the old bridge and two campsites located within the proposed trail relocation segment would be converted to a day-use picnic area.

Approximately 0.1 acre would be disturbed for the construction of the new bridge and the re-alignment of the trail.

- **Use/Operation of the Facility** – The improved facility's primary use would continue to be for visitors. The ability of this facility to be used by disabled visitors would be expanded and a new trail bridge would be constructed. The campground would be permanently closed and the entire area would become day-use only.


Lost Valley Amphitheater

- **Utilities** – This facility would not require any utilities.
- **Access** – In addition to the existing level of access, disabled visitors would have increased access to the lower trail (below the natural bridge) and the amphitheater.
- **Parking** – The existing parking facility would be modified to accommodate the new bridge. More capacity would be added to the day use area adjacent to the parking lot.
- **Revegetation** – The campground would be allowed to naturally return to pre-development conditions by the discontinuation of clearing maintenance and diversion of pedestrian traffic away from the old campsites. Fire rings would be removed. Disturbance along the margin of the new trail alignment and at the amphitheater would be allowed to naturally revegetate over time.
- **Construction Staging** – During construction, material stockpiles would be located in a cordoned off section of the parking lot. If this space is limited, then material would be brought in asneeded. The amphitheater would be closed for brief periods during construction.


New Stone Steps to Eden Cave

This alternative is based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternative are only estimates and could change during final site design. If changes during final site design are inconsistent with the intent and effects of the selected alternative, then additional environmental compliance would be completed, as appropriate.

Mitigation Measures included in Alternative B

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and would be implemented during construction of the action alternative, as needed:

- The same soil stabilizers that were used for the segment of the trail already upgraded would be used to ensure a good color match and ability to blend in with the natural environment. The soil stabilizer would not contain any toxic substances that, once cured, could potentially contaminate the environment at Lost Valley.
- To minimize the amount of ground disturbance, staging and stockpiling areas would be sited at the lower end of the parking lot, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.
- Construction staging areas would be identified and fenced with construction barrier fencing or some similar material prior to any construction activity. The fencing would

define the construction staging areas and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.

- Revegetation along the new trail margin, in the path of the existing trail, and in the campground would be allowed to occur naturally.
- Strict invasive weed control Best Management Practices would be used, including, but not limited to, thoroughly pressure washing equipment before bringing it on site, to minimize the introduction of noxious weeds.
- Employees and construction crews would be required to park their vehicles in locations that would minimize the inconvenience to visitors.
- Because disturbed soils are susceptible to erosion until revegetation takes place, standard erosion control measures such as the use of silt fences and/or sand bags where necessary would minimize any potential soil erosion.
- Standard construction Best Management Practices would be used during construction of the new trail alignment including immediately refilling holes and compacting disturbed soils to protect them from erosion until the permanent trail surface is installed. Construction activities would be carried out in the fall when heavy storm events are rare and ground-disturbing activities would be completed as quickly as possible.
- To reduce noise and emissions, construction equipment would not be permitted to idle for long periods of time.
- To minimize possible petrochemical leaks from construction equipment, laborers would regularly monitor and check construction equipment to identify and repair any leaks. Additionally, all equipment would be parked on absorbent matting overnight and all leaks would be cleaned up immediately upon discovery. Any contaminated soils would be managed according to State and federal regulations.
- Construction crews and supervisors would be informed about special status species and poachable plants. Construction activities would be halted if a species were discovered in the project area until BNR staff re-evaluates the project. This would allow modification of the project for any protection measures determined necessary to protect the discovery.
- The new trail alignment would be routed to avoid large trees of the kind suitable for bat roosting.
- The new trail alignment would be routed to avoid any sensitive plants in the area.
- To minimize the potential for adverse effects to BNR visitors, variations in construction timing may be considered. One option includes conducting the majority of the work in the off-season (winter) or shoulder seasons. Another option includes implementing daily construction activity curfews such as not operating construction equipment between the hours of 6 PM to 7 AM in summer (May – September), and 6 PM to 8 AM in the winter (October – April). The NPS would determine this in consultation with the contractor.
- Construction crews and supervisors would be informed about the special sensitivity of BNR's values, regulations, and appropriate housekeeping.
- Construction crews would be trained to identify and avoid the three State Inventory Element plants in the area and would be shown their locations along the trail by the BNR botanist prior to the initiation of construction activities.
- According to *Management Policies 2006*, the NPS would strive to construct the new trail alignment with sustainable designs and systems to minimize potential adverse environmental effects. Development would not compete with or dominate BNR features, or interfere with natural processes, such as the seasonal migration of wildlife or

hydrologic activity associated with wetlands. To the extent possible, the design and management of the trail and day-use area would emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. The NPS also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology. Energy efficiency is incorporated into the decision-making process during the design and acquisition of buildings, facilities, and transportation systems that emphasize the use of renewable energy sources.

Alternatives Considered and Dismissed

The proposed improvements at Lost Valley in this EA have been under discussion by NPS staff at BNR headquarters since 2010. Prior to that, an EA was prepared for other improvements to Lost Valley Trail and other facilities at BNR in which improvements currently under construction were discussed. The proposed improvements, as described in this EA, are the result of a flood that occurred in 2011 that demonstrated the need to modify the lower portion of the trail, which was part of the proposed action in the BNR Facilities Improvements EA completed in 2010. Maintaining the existing trail alignment within the 100-year floodplain and upgrading it to make it barrier-free was considered in the 2010 BNR Facilities Improvements EA, but dismissed from consideration in this EA because it does not meet the purpose and need for avoiding the 100-year floodplain to the extent possible and the potential damage that could occur to the trail as a result. Also, in response to a public comment received during the scoping period, moving the campground out of the floodplain to one of the nearby hayfields was considered, but dismissed because a campground at this location would have a negative visual effect on the Boxley Historic District.

Alternative Summaries

Table 1 summarizes the major components of Alternatives A and B, and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets each of the objectives identified for this project, while the No Action Alternative meets almost none of the objectives.

Table 1 – Summary of Alternatives and How Each Alternative Meets Project Objectives

Alternative Elements	Alternative A – No Action	Alternative B – Construct Improvements
Re-align a section of the trail so it is outside the 100-year floodplain	The trail would remain in the same location.	Trees, stumps, roots, and vegetation would be cleared through an area that is out of the 100-year floodplain where the trail would be safe from damage as a result of a 100-year flood.
Install ABA compliant trail surface for the amphitheater and a portion of Lost Valley Trail.	No improvements to the amphitheater or any portion of the trail beyond the parking area would be constructed.	The portion of the trail up to 720 feet would be resurfaced to a width of 60 inches with a soil stabilizer to make it barrier-free. This surface would extend into the amphitheater at the beginning of the trail. Two of the benches in the amphitheater would be replaced with shorter benches to provide room for wheelchairs.

Alternative Elements	Alternative A – No Action	Alternative B – Construct Improvements
Install drainage structures beneath the trail at drainage crossings.	Existing drainage crossings would remain the same, with possibly an occasional improvement made as a maintenance activity.	At each location where water is channelized and flows across the trail, some type of hidden culvert, PVC or metal pipe, or a bridged flagstone channel would be installed to direct runoff beneath the trail.
Construct new bridge over Clark Creek	Existing stone low-water pedestrian crossing would remain the only option for crossing the creek when water is present.	A 70 foot pedestrian bridge would be installed across the channel adjacent to the parking lot.
Permanently close Lost Valley Campground and remove fire rings.	The campground would be reopened and would remain within the 100-year floodplain. Escape to vehicles and out of the campground area would be mostly impossible as the campground is across the creek from the parking area.	The campsites would be allowed to continue naturally returning to their pre-developed condition. Fire rings would be removed. Since the campground has been under temporary closure since the flood in 2011, the campsites are already nearly completely grown over with native vegetation from the surrounding forest.
Modifications to existing parking lot to accommodate access to the new bridge.	No changes to the existing configuration of the parking lot would be made.	The area immediately around the end of the bridge on the parking lot side would be designed to prevent vehicles from blocking access by pedestrians and the mobility impaired.
Reduce the potential for safety hazards caused by flash flood events	No. The safety of campers at the existing campsites would still be in jeopardy should a major storm event result in severe flooding along Clark Creek.	Yes. Elimination of the campsites within the floodplain would result in the corresponding elimination of flood hazard to campers during major storm events.
Reduce trail erosion at drainage crossings.	Possibly, if the installation of subsurface culverts or stone channels is carried out as a maintenance activity. A major flood would still result in further erosion of the trail.	Yes. Because the trail would be realigned outside of the floodplain, and culverts would be included at drainage crossings, erosion would be minimized.
Make a portion of the Lost Valley trail and the amphitheater handicap accessible.	No. Barrier-free portions of the trail currently under construction would not be connected to the parking lot.	Yes. The new trail surface and space for wheelchairs at the amphitheater would make it possible for mobility impaired individuals to access the amphitheater and the trail up to the fork.

Environmentally Preferable Alternative

The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources (40 CFR § 1500-1508 [1987]). In accordance with the requirements of 40 CFR §1505.2, a bureau must identify the environmentally preferable alternative(s) in the record of

decision. It is not necessary that the environmentally preferable alternative(s) be selected in the record of decision (40 CFR § 46.450).

Alternative A, no-action, protects and preserves historic, cultural and natural resources insofar as no ground disturbing activities, other than the superficial trail maintenance activities at Lost Valley, would take place.

Alternative B, realign the Lost Valley trail, upgrade the trail to make it barrier-free, and permanent closure of the campground, is the environmentally preferable alternative because the proposed ground disturbing activities, namely removal of vegetation for realignment of the trail out of the floodplain and restoration of the existing trail alignment within the floodplain to pre-trail natural conditions, would ultimately reduce the potential for soil erosion and the release of additional sediments into Clark Creek and the Buffalo River during large flood events. Permanently closing the campground would also allow the Beech-Maple Forest to return to more natural conditions; over time this will reduce soil compaction, root exposure, tree scarring, and the amount of bare ground in the former campground area. This will result in a healthier forest ecosystem and improved water quality in Clark Creek and the Buffalo River following rain events.

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Consequently, because it meets the purpose and need for the project, the project objectives, and is the environmentally preferable alternative, Alternative B is also recommended as the NPS preferable alternative. For the remainder of the document, Alternative B will be referred to as the Preferable Alternative.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Existing Conditions of Resource Topics Retained For Further Detailed Analysis

In this section and the following section on *Resource Topics Dismissed from Further Detailed Analysis*, the NPS takes a "hard look" at all potential effects by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Effects are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of effects is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates "major" effects with "significant" effects. The identification of "major" effects would trigger the need for an EIS. Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

The NPS defines "measurable" effects as moderate or greater effects. It equates "no measurable effects" as minor or less effects. "No measurable effect" is used by the NPS in determining if a categorical exclusion applies or if impact topics may be dismissed from further evaluation in an EA or EIS. The use of "no measurable effects" in this EA pertains to whether the NPS dismisses an impact topic from further detailed evaluation in the EA. The reason the NPS uses "no measurable effects" to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail, in accordance with CEQ regulations 1500.1(b).

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders; *Management Policies 2006*; and NPS knowledge of resources at BNR. Impact topics that are carried forward for further analysis in this environmental assessment are listed below along with the reasons why the impact topic is further analyzed. For each of these topics, the following text also describes the existing setting or baseline conditions (i.e. affected environment) within the project area. This information will be used to analyze effects against the current conditions of the project area in the *Environmental Consequences* chapter.

Soils

According to the NPS's *Management Policies 2006*, the NPS will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue (NPS 2006). These policies also state that the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.

Soils in the Lost Valley Trail area are the Ceda cobbly loam, frequently flooded (within the floodplain of Clark Creek) and the Arkana-Moko complex, 20 to 40 percent slopes (the hillsides adjacent to Clark Creek) (USDA 1988, 2013). The Ceda cobbly loam is a well-drained, rapidly permeable soil that has a slight hazard of erosion and for which surface runoff is slow to medium. The Arkana-Moko complex is a well-drained, moderately permeable soil that has a severe hazard of erosion and for which surface runoff is rapid.

Vegetation

According to the NPS's *Management Policies 2006*, 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).

Plant communities at BNR are rich and diverse. The ridges, bluffs, hillsides, and valleys provide a variety of habitats, supporting over 1,500 species of plants. The major forest types are Floodplain, Mixed Hardwood, Oak-Hickory, Oak-Pine, Cedar Glade, Beech Forests. Cultivated fields (mostly consisting of hay and other cattle forage grasses), fields being restored to warm grass communities, and abandoned fields at different stages of ecological succession are present throughout the area (NPS 2005). The Lost Valley trail winds its way through a mature hardwood forest with a notable population of beech trees and a rich and diverse shrub and herbaceous layer.

Special Status Species

The Endangered Species Act of 1973 requires examination of potential effects on all federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the *Management Policies 2006* and Director's Order-77 *Natural Resources Management Guidelines* require the NPS to examine the effects on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006). For the purposes of this analysis, the USFWS, the Arkansas Natural Heritage Commission (ANHC), and the Arkansas Game and Fish Commission (AGFC) were contacted with regard to federally- and state-listed species to determine those species that could potentially occur on or near the project area. Responses were received from the ANHC and AGFC. A copy of the scoping letters and responses are included in Appendix A.

Five protected species are identified for Newton County on the USFWS Arkansas Field Office website (USFWS 2012a) and the Arkansas Natural Heritage Commission website (ANHC 2012) and are presented in Table 2. A complete list, including those not protected, but listed for inventory by the ANHC for the area are presented in Appendix A.

Table 2 – Federal and State protected species known to occur within BNR

Scientific Name	Common Name	Federal Status	State Status
Birds			
Haliaeetus leucocephalus	Bald eagle	BGEPA	INV
Mammals			
Corynorhinus townsendii ingens	Ozark big-eared bat	E	INV
Myotis grisescens	Gray bat	E	INV
Myotis sodalis	Indiana bat	E	INV
Invertebrates			
Quadrula cylindrica cylindrica	Rabbitsfoot	C	INV

BGEPA = Bald and Golden Eagle Protection Act

E = Endangered

T = Threatened

C = Candidate

INV = Inventory Element (Species for which the ANHC is currently conducting active inventory work and for which there is a conservation concern.)

Bald eagles (*Haliaeetus leucocephalus*) winter along larger streams and water bodies in the southern United States. This species relies on rivers for most of its food. It typically roosts on large trees or snags on banks and hillsides overlooking water. There have been no nesting pairs of this eagle found within the boundary of BNR since the species was removed from protection under the Endangered Species Act. As of 2003, each winter for most of the previous twelve years, an eagle survey was performed by BNR staff. The survey was conducted as a one-day, intensive search designed to cover as much of the river as possible. The lower sections of the river have a wintering population of approximately one eagle per two river miles. (NPS unpublished records).

Ozark big-eared bats (*Corynorhinus townsendii ingens*) roost in caves and mines year round. Colonies are small, generally under 1,000 individuals. They tend to roost near the entrances of caves and mines and have been found roosting in rock overhangs, talus piles, and other fairly exposed locations (NPS 2010). These are large bats which prefer to forage in open forests or on forest edge (USFWS 1995). Ozark big-eared bats forage over fields, streams, forest edges, mountain slopes, cliff faces, and in clearings. They feed primarily on small moths, though they will also catch and eat beetles (NPS 2010). Their summer roost requirements are variable. They may roost in caves proper, or in fractures in limestone or sandstone bluffs. In winter they require a cave which will act as a cold trap and maintain a temperature between 0 and 13 degrees Celsius. The humidity must be between 60 and 97 percent (USFWS 1995). There are three caves and one abandoned mine within the boundaries of BNR known to house one or two individuals of this species over the past fifteen years. All of these roost sites are well beyond thirty miles from this site. None of the caves present near the proposed project location are historically known to house this species.

Gray bats (*Myotis grisescens*) roost exclusively in caves and mines year round where they form large colonies, sometimes in excess of 250,000 individuals. Because of these large colonies, the bats are very vulnerable to human disturbance at its roost sites. The roost caves are generally near streams or other water bodies such as reservoirs. This species prefers to forage over streams in wooded riparian habitats, especially slab-rock river bottoms where mayflies hatch. Gray bats use cave-type habitat year round for roosting, rearing young, and hibernation. Habitat disturbance in the forms of forest conversion to agriculture, destruction of riparian forest, river impoundment, pesticides, river siltation, and roost disturbance are the most important factors seeming to affect this species (USFWS 1982). Gray bats have recently undergone a remarkable recovery in numbers. Much of this is due to closing roosts to prevent human disturbance.

BNR has seven hibernacula, one maternity roost, and eight summer roost sites for this species. As of 2003, population data had been collected by NPS, AGFC, and other researchers for the previous 18 years (NPS 2003). As a result, there are twelve caves and two abandoned mines which are known to support gray bats during some part of each year at BNR. Five of these caves and one of the abandoned mines are used as hibernacula. One of the caves is a maternity roost. Eight caves and one abandoned mine are used as summer roosts by males or non-reproducing females. The difference in the numbers reported here is a result of one cave being used both as a summer roost and winter roost. None of these caves are present in the proposed project location. The largest winter colony of gray bats in Arkansas is located four miles from Lost Valley, so the area may be within the foraging range of gray bats.

Indiana bats (*Myotis sodalis*) roost in caves during the winter in colonies of up to 100,000 individuals. In the summer they tend to roost and raise their young under the sloughing bark of snags and under the bark of shagbark hickory (*Carya ovata*), green ash (*Fraxinus pennsylvanica*), elm (*Ulmus* sp.), cottonwood (*Populus deltoides*), and other trees with large loose bark plates. These summer roosts tend to be in lowland habitats near water, with direct sun exposure for half the day or more (NPS 2010). The colonies are most commonly located in

bottomland or riparian areas, but have also been found in pastures and upland hardwoods. The maternity roosts are usually found in larger diameter trees. They are not generally a cavity-roosting species. Primary maternity roosts are generally located where they receive considerable sunlight. This may assist with pup development. Typically, roosts will be higher in the tree if the canopy closure is greater. This may be an effort to get more sunlight on the roost (Menzel et al 2001).

Indiana bats forage in or beneath the forest canopy along streams and in upland forests, mature wood lots, clearings with early succession vegetation, along wooded fence rows, and over farm ponds. They feed on a variety of insects including moths, caddis flies, beetles, and flies. Indiana bats are found in four hibernacula at BNR. These bats have not been captured at BNR in the summer months, but it is the possible that a maternity colony exists in the area. There are no confirmed maternity colonies in the state. A lack of suitable summer roost trees does not seem to be a limiting factor in this species' recovery; potential roost trees are regularly recruited from dead and dying trees. Potential roost trees for this species occur in the vicinity of the project location. The largest Indiana bat hibernation roost in Arkansas is within four miles of Lost Valley. It is possible that the Lost Valley trail is within the foraging range of this species.

Eastern small-footed bats (*Myotis leibii*) roost in caves, talus slopes, rock crevices, and hollow trees. They generally roost alone or in small groups (NPS 2010). These bats, which are listed as an Inventory Element by ANHC, have been found in two caves at BNR and have been captured by mist netting in upland areas near BNR. Population numbers are assumed to be fairly low in this area. They have also been documented in Newton and Searcy counties (Sealander et al. 1990). These bats use caves and mines as their hibernacula. Apparently, north Arkansas is near the edge of the range of this species. Very little is known about their foraging habits and habitat preference in the warm months. Based on the Western small-footed bat, it is surmised that this species may forage mostly along stream margins in woodlands, catching small prey (BCI 2001) such as moths, flies, caddis flies, beetles, and other insects (NPS 2010). They require cold, low humidity hibernation sites. They enter hibernacula late and leave early compared to other species of Myotis. They are generally gone from the caves by March (Barbour et al 1969). In summer the bats appear to roost in rock crevices and under rocks, fairly near their hibernation site (BCI 2001). Eastern small-footed bats have been seen at two caves within four miles of the Lost Valley trail. It is possible that the Lost Valley Trail is within this species' foraging area.

The rabbitsfoot mussel (*Quadrula cylindrica cylindrica*) occurs in medium-to-large rivers with sand/gravel or gravel substrates. It is widespread in Arkansas, but is usually not found in great numbers at any site. This species is listed as a candidate by the USFWS and as an Inventory Element by ANHC. Like almost all other mussel species, the rabbitsfoot requires an intermediate host to parasitize to transform from a larvae to a juvenile. Clark Creek is an intermittent tributary to the Buffalo River. As such, there is no suitable habitat for the rabbitsfoot within the proposed action area.

The Buffalo River from Cecil Creek to Grinders Ferry is proposed critical habitat for the rabbitsfoot mussel. Rabbitsfoot is a filter feeder that requires water with little suspended sediment. Suspended sediment can clog the mussel's vents; thus, suspended sediment from erosion in Clark Creek could be causing some adverse effect to populations downstream of the Clark Creek confluence with the Buffalo River.

A special status plant survey was conducted along the Lost Valley Trail on July 12, 2010 by the BNR botanist (NPS 2010a). Arkansas alumroot (*Heuchera villosa* var. *arkansana*) is known to occur on bluffs and boulders in the Lost Valley Trail area, particularly near Eden falls. This species is listed as an Inventory Element by the ANHC and has no federal status. Two other plants listed by the ANHC as Inventory Elements occur along the trail at Lost Valley. These two species are commonly poached; therefore, their names and specific locations are not disclosed

in this EA. No other species either protected or of special concern, are specifically known to occur within the proposed project area.

Protection under the Migratory Bird Treaty Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition, this act serves to protect environmental conditions for migratory birds from pollution or other ecosystem degradations. Some migratory birds certainly use or pass through the proposed project location from time to time either during migration, nesting season, or as winter residents. Bald eagles occur as migrants and winter residents at BNR. At present no bald eagle or other raptor nests are known to occur at or near the proposed project location.

Visitor Use and Experience

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. Further, 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.

Visitation statistics are kept by the NPS at all of the national parks, rivers, and monuments. Visitation data for BNR can be found online at: https://irma.nps.gov/Stats/Reports/ReportList (see Appendix B). An explanation of how the counting is done can also be found at this website. November, December, January and February are the periods of lowest visitation with less than 50,000 visitors per month in 2011. Visitation peaked in June 2011 with 192,333 visitors recorded for that month. Total visitation in 2011 was 1,169,802. Complete data for 2012 have not yet been published.

The primary visitor activity is touring the river, which is the main attraction (NPS 2000). The clean, free-flowing waters of the BNR, set off by the surrounding bluffs, cliffs, woods and pastoral lands, constitute a visual resource enjoyed by visitors. BNR has two major highway crossings, a number of smaller ones, and 47 access points, providing for dispersed entry to this linear park (NPS 2003a). Popular outdoor recreational and educational activities at BNR include hunting, fishing, camping, hiking, interpretive programs, horseback riding, and of course, floating the river by raft, canoe, or kayak. Numerous trails wind their way through BNR providing hikers and equestrians multiple opportunities to enjoy the Ozark Mountains with their rich variety of forests and pastures.

Visitors also frequently visit Lost Valley with its associated trail, natural bridge, waterfalls, and readily accessible cave. The Lost Valley Trail is an approximately one-mile, day-use trail that follows Clark Creek for most of its course. Near the end of the trail, it turns uphill at a natural bridge and waterfall (Eden Falls) to terminate at Eden Falls Cave. Beyond the fork in the trail, the trail is unimproved except for native stone steps in some locations and a few drainage crossings that have been stabilized with native stone. It provides an excellent and readily accessible frontcountry day-hike on varying terrain through forest containing an abundance of beech trees and other flora and fauna. It currently receives the highest visitor use of any trail at BNR.

Traffic count data has been collect for Lost Valley since 1993. Based on the theory that most cars entering the area have at least two visitors, these counts can be doubled to determine visitor usage. Traffic count data for Lost Valley through September 2012 indicate an exceptionally high peak number of vehicles in June at 5,832 with a low in January at 646 vehicles (NPS 2013). The month of peak visitation varies from year to year, but generally

follows a pattern of high visitation from March through October or November and low visitation from December through February. Visitation at Lost Valley saw a decreasing trend from 12,635 vehicles in 1993 to 7,119 vehicles in 2001, after which it has steadily increased to approximately 30,000 in 2012. Lost Valley visitation in 2010 was similar to visitation in 2011 at 22,226 and 22,390, respectively. The NPS does not collect data on overnight camping at Lost Valley.

Soundscape Management

In accordance with *Management Policies 2006* and Director's Order-47 *Sound Preservation and Noise Management*, an important component of the NPS's mission is the preservation of natural soundscapes associated with NPS units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. 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. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The permanent closure of the campground would have a long-term beneficial impact, by removing noise caused by overnight use of the area.

During construction, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be short-term, lasting only as long as the construction activity is generating the sounds, would generally be confined to the immediate vicinity of the construction activities, and would have a minor adverse effect on visitors and employees. Such negligible effects would be consistent with §1.4.7.1 of NPS *Management Policies* 2006.

Lightscape Management

In accordance with *Management Policies 2006*, the NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). BNR strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The removal of the campground would have a long-term beneficial impact on reducing light pollution. There are no lights at any of the facilities where improvements are proposed and no new lights are included in the proposed action; therefore, there would be no effects to the natural ambient lightscape as a result of the proposed improvements.

Resource Topics Dismissed From Further Detailed Analysis

In this section of the EA, NPS provides a limited evaluation and explanation as to why some impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation in this EA if:

- they do not exist in the analysis area, or
- they would not be affected by the proposal, or the likelihood of effects are not reasonably expected, or
- through the application of mitigation measures, there would be minor or less effects (i.e. no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

Due to there being no effect or no measurable effects, there would either be no contribution towards cumulative effects or the contribution would be low. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of direct and indirect, and cumulative effects is presented. There is no impairment analysis included in the limited evaluations for the dismissed topics because the NPS's threshold for considering whether there could be impairment is based on "major" effects.

Geology and Topography

According to the NPS's Management Policies 2006, the NPS will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue (NPS 2006).

While there are significant topographic and geologic features within BNR, improvements planned at Lost Valley would not alter either the topography or the geology of that area. Because there would be no effects to topographic and geologic features, this topic is dismissed from further analysis in this EA.

Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The NPS, under *Management Policies 2006* and Director's Order 77-2 *Floodplain Management,* will strive to preserve floodplain values and minimize hazardous floodplain conditions.

In December 1982, rainfall in the Buffalo River watershed led to a discharge along the river that peaked at 158,000 cubic feet per second (Neely 1985) near St. Joe, Arkansas. This discharge, with a recurrence interval estimated at 65 years, caused widespread flooding along the Buffalo River. Even greater magnitude floods with recurrence intervals of 100 and 500 years have greater velocities, rise higher, and spread farther across the floodplain. The relatively steep slopes and narrow widths of the Buffalo River make it susceptible to flash flooding. With the exception of the aforementioned 1982 December flood, there were no floods during the last four months of each year from 1991 through 1995.

In April 2011, heavy rains resulted in flash flooding and high water levels along the Clark Creek. The flooding washed out the foot bridge over the river, scoured the trail, and created a number of unsafe areas.

During floods, the river carries large amounts of debris, as do most rivers. Usually this does not pose a threat to bridges because most are either low-water bridges or high-water bridges that span the channel with very little contraction. Debris buildup on houses, barns, and other structures within the floodplain, however, does increase the likelihood of these structures failing.

BNR includes a number of facilities, such as campgrounds and river access points, which are located beside the river and are thus exposed to flooding. While floods may on occasion lead to temporary closure of such facilities, they do not generally cause major damage or destroy them, nor do these facilities impede the flow of floodwater as it recedes.

Except for aquatic habitats associated with the river and its tributaries, BNR is not particularly known for wetlands (USFWS 2012b). It contains no marshes, swamps, or bogs of note.

The Federal Emergency Management Administration has not mapped BNR for flooding. Some portions of the Lost Valley Trail and the campground on Clark Creek are subject to flash flooding during severe rain events. Most of the lower trail along the creek is within the 100-year floodplain for Clark Creek.

During construction, some potential exists for soil erosion during storm events; however, the proposed improvements would be constructed in the fall when rainfall is typically minimal. The

proposed improvements would be direct, beneficial, local, long-term, and negligible because the ABA portion of the trail would have stabilized soils that resist erosion, and drainage structures installed beneath the trail would further reduce trail erosion. In addition, re-aligning the trail so it is outside of the floodplain and closing the campground would have long-term beneficial effects on the local floodplain. The deck of the pedestrian bridge over Clark Creek would be constructed at an elevation that is above the 100-year flood elevation and thus, would not impede the flow of receding floodwaters. Receding floodwaters would flow around and through the abutments at each end of the bridge, which would be designed according to recommendations by the Arkansas Game and Fish Commission to include a series of pipes in the access ramps to minimize the potential of the ramps to act as dams during flood events. Because these effects are minor or less in degree, this topic is dismissed from further analysis in this EA.

Wildlife

According to the NPS's *Management Policies 2006*, 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 BNR include elk, white-tailed deer, raccoon, opossum, bobcat, mink, black bear and beaver (NPS 2005) along with increasing numbers of feral pigs. Elk populations have slowly increased since their re-introduction to the area in 1981 and sightings are common in the upper district of BNR. The lack of natural predators has left hunters and disease events to regulate most ungulate populations. Many fluctuate at or near ecological carrying capacity.

All of the proposed improvements would occur in areas that are already developed and receive frequent human visitation. Wildlife typically avoid these areas during daylight hours to avoid humans. Disturbed areas would be revegetated and rehabilitated following construction, which would result in a negligible to minor adverse impact to the wildlife and wildlife habitat in the immediate area of construction.

During construction, noise would also increase, which may disturb wildlife in the general area. Construction-related noise would be temporary and existing sound conditions would resume following construction activities at the end of the workday. Therefore, the temporary noise from construction would have a negligible adverse effect on wildlife.

There would be a negligible overall loss of wildlife habitat. Further, such 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. Because these effects are minor or less in degree, this topic is dismissed from further analysis in this EA.

Water Resources

The enabling legislation for BNR (Public Law 92-237) stipulates specific protections under Section 4 by stating that:

> …no department (including the NPS) shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary [of Interior]. Nothing contained in the foregoing sentence, however, shall preclude licensing of, or assistance to, developments below or above the Buffalo National River or on any stream tributary thereto which will not invade or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area on the date of approval of this Act.

Clark Creek is an intermittent tributary to Buffalo River, which is known for flash flooding events. The proposed improvements would have a beneficial impact to water quality by reducing erosion and the liberation of sediment into Clark Creek and the Buffalo River. The United States

Army Corps of Engineers was contacted regarding potential impacts. The response is included in Appendix A. No activities are planned below the ordinary high water mark in Clark Creek; therefore, no Clean Water Act Section 404 permit and no Section 401 water quality certification would be required. Because these effects are beneficial and minor or less, this topic is dismissed from further analysis in this EA.

Archeological Resources

In addition to the National Historic Preservation Act and the NPS *Management Policies 2006*, the NPS's Director's Order-28B *Archeology* affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the National Park System. As one of the principal stewards of America's heritage, the NPS is charged with the preservation of the commemorative, educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the National Park System reflect a commitment to the conservation of archeological resources as elements of our national heritage.

BNR contains numerous prehistoric and historic archeological sites, over 700 recorded as of 2003, spanning almost 10,000 years of human history (NPS 2003). A common occurrence at BNR is the overlay of historic structure upon historic archeological site upon prehistoric archeological site. Site condition varies from good to destroyed, with impact levels varying from low to severe.

Known historic archeological sites cover a period beginning in the early 1800s when modern Native Americans such as the Osage and the Cherokee were present. Most of the historic archeological sites are associated with nineteenth and twentieth century Euro-American settlements. These sites vary from vegetation-covered areas with no above-ground resources, to abandoned farms, communities, and industries. Civil War engagements are reported to have taken place at various locations along the river. Sites associated with the region-wide mining of lead and zinc include the sites in the Rush Historic District as well as numerous unstudied sites in the Lower Buffalo Wilderness. Other known sites are associated with the processing of guano from bat caves to produce gunpowder and sites associated with the logging industry, including major milling sites and "tie slides," where logs were pushed off ridges to glide down to the river to waiting rafts (NPS 2003).

Standing structures and ruins are the most visible part of the overall national river cultural landscape and are scattered throughout its boundary. Settlement occurred along the river's length, in fertile tributary valleys, and along forested slopes. Structures or other remains are virtually everywhere, whether still in use as part of active farms or long abandoned. The NPS's List of Classified Structures (structures on or eligible for the National Register) for BNR lists 256 structures. Under a 1988 Memorandum of Agreement with the Arkansas State Historic Preservation Officer, structures, including those in Wilderness, will be inventoried and determinations of National Register eligibility made. However, staff and funding constraints have focused National Register evaluations towards areas slated for development with the result that only a few Wilderness area structures have been evaluated.

The cultural resources of concern at Lost Valley pertain to the historic State Park facilities, and for this project, the trail in particular. Prior to the acquisition of the land by the NPS, the current parking area was the campground for Lost Valley State Park. Prior to NPS ownership, the land was a pasture and part of the Primrose Farm. The trail system is essentially the same now as it was when managed by the State Park. The existing segment of the trail within the floodplain would be allowed to naturally return to its predeveloped condition and the new alignment would be a short distance away where it would provide nearly identical historic feel. There are no known Native American remains within the area of potential effect at Lost Valley and no other

cultural or prehistoric resources recorded for the area (Clark 2010). This topic is dismissed from further analysis in this EA because there are no prehistoric resources at Lost Valley and the historic resources located at Lost Valley would not be affected by the proposed improvements.

Ethnographic Resources

NPS's Director's Order-28 *Cultural Resource Management* defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. According to DO-28 and Executive Order 13007 on sacred sites, the NPS should try to preserve and protect ethnographic resources.

Ethnography is concerned with contemporary peoples associated with the national river, with their cultural systems or ways of life, and with the related technology, sites, structures, other material features, and natural resources within its boundaries. These groups typically assign significance to places closely linked with their own sense of purpose, existence as a community, and development as ethnically distinctive peoples. Important places may support subsistence or ceremonial activities or represent birthplaces of significant individuals or group origin sites. Both culturally affiliated American Indian tribes recognized by the federal government and white ethnic groups, which have endured for two generations or more within the boundaries, are considered traditional users. Ethnographic resources are subsistence and ceremonial locales and sites, structures, objects, and rural landscapes assigned cultural significance by traditional users. Natural resources may have heritage significance in activities and beliefs related to, for example, religion, healing, and subsistence. Some peoples' religious beliefs also require quarrying certain minerals or collecting certain plants in specific places for sacred or medicinal purposes.

Certain contemporary Native American and other communities are permitted by law, regulation, or policy to pursue customary religious, subsistence, and other cultural uses of park resources with which they are traditionally associated. Such continuing use is often essential to the survival of family, community, or regional cultural systems, including patterns of belief and economic and religious life. Recognizing that its resource protection mandate affects this human use and cultural context of park resources, the NPS will plan and execute programs in ways that safeguard cultural and natural resources while reflecting informed concern for the contemporary peoples and cultures traditionally associated with them.

Ethnographic surveys or studies are not currently available for BNR due to staffing and funding constraints. In 2000, the NPS contracted for a cultural affiliation study in order to determine which federally recognized Native American tribes are affiliated with BNR. The study is in draft form at this time. Ten tribes have been reported to be culturally affiliated with BNR:

- the Absentee Shawnee Tribe;
- the Caddo Tribe of Oklahoma;
- the Cherokee Nation of Oklahoma;
- the Eastern Shawnee Tribe of Oklahoma;
- the Osage Tribe of Oklahoma;
- the Quapaw Tribe of Oklahoma,
- the Shawnee Tribe;
- the Tunica-Biloxi Tribe of Louisiana;
- the United Keetoowah Band of the Cherokee Nation, and
- the Wichita and Affiliated Tribes.

BNR staff have attempted to contact the affiliated Tribes through normal channels; however, none of the Tribes have demonstrated any interest in the proposed actions. The lack of

responses is interpreted to indicate that no effects to significant ethnographic resources would be expected. The proposed actions, therefore, are consistent with §1.4.7.1 of NPS *Management Policies 2006*. Because there would be no effects to ethnographic resources, this topic is dismissed from further analysis in this EA.

Paleontological Resources

According to *Management Policies 2006*, paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research (NPS 2006). At BNR, paleontological resources are widespread and ubiquitous, but well preserved specimens are generally restricted to caves and overhanging bluffs. The Lost Valley Natural Bridge, Cob Cave, and Eden Falls Cave were all formed in the Mississippian age Boone limestone formation. This shallow marine formation is known for its fossil crinoids, blastoids, corals, brachiopods, and bryozoans. These fossils are very apparent in the floor, walls, and ceiling of Eden Falls Cave. These resources are not unusual or rare, and exist in vast numbers throughout a wide geographic range.

In addition to these fossils, there is a depositional structure across Clark Creek from the “hollow beech tree” which has been interpreted as a Waulsortion mound, or a pseudo-Waulsortion mound. Additional paleontological resources exist in the bed of Clark Creek. These are generally fossils from the Pennsylvanian age Bloyd formation. The Bloyd formation contains a thick bluff-forming sandstone member known as the middle Bloyd sandstone. This sandstone is interpreted as a fluvial deposit that was laid down by a vast braided river system rising far to the northeast. Because it is a non-marine bed it contains a substantial number of plant fossils. Sometimes, these plant fossils may be found in the bed of Clark Creek where they have been transported by gravity and water from the bluffs 700 feet above the creek bed.

There would be no effects to paleontological resources. Further, there would be no unacceptable effects; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies 2006*. Because these effects are minor or less in degree, this topic is dismissed from further analysis in this EA.

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 BNR, including all of the improvement project locations, is designated as a Class II air quality area under the Clean Air Act as amended (NPS 2003a). 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 (ADEQ 2010).

Construction activities such as hauling materials and operating heavy equipment 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 BNR is rare. Overall, the project could result in a negligible degradation of local air quality; however, such effects would be very short-term, lasting only while construction activities involving heavy equipment are underway. The Class II air quality designation for BNR would not be affected by the proposed action. Further, 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. Because there would be no effects on air quality, this topic is dismissed from further analysis in this EA.

Socioeconomics

The proposed action would change neither local nor regional land use nor appreciably affect local businesses or other agencies in an adverse way. Implementation of the proposed action could provide a negligible beneficial impact to local small businesses, such as local campgrounds, due to the permanent closure of the Lost Valley campground. Because the effects to the socioeconomic environment would be negligible and likely beneficial, this topic is dismissed from further analysis in this EA.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. Both categories require that the land be available for farming uses. The lands at Lost Valley are not available for farming and, therefore, do not meet these criteria. Because there would be no effects on prime or unique farmlands, this topic is dismissed from further analysis in this EA.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated effects to Indian trust resources from a proposed project or action 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 BNR. The lands comprising the river are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Because there are no Indian trust resources, this topic is dismissed from further analysis in this EA.

Environmental Justice

Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The Environmental Protection Agency EJView was used to research the population characteristics in the project area. Within a 10-mile radius of the project location the total population is 3,112. Six percent of the population is reported as minority (U.S. Census Bureau 2010). The American Community Survey (ACS) summary data shows that 24-percent of the population in the 10-mile area reported a household income in 1999 that was less than $15,000. The greatest percentage of the population (31-percent) reported a household income between $25,000 and $50,000 (U.S. Census Bureau, ACS 2006 – 2010).

Because the proposed improvements would be available for use by all visitors regardless of race or income, and the construction workforces would not be hired based on their race or income, the preferable alternative would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Because there would be no disproportionate effects, this topic is dismissed from further analysis in this EA.

Effects to Resource Topics Retained for Detailed Analysis

This chapter analyzes the potential environmental consequences, or effects, that would potentially occur as a result of implementing the proposed project. Topics analyzed in this chapter include soils, vegetation, special status species, and visitor use and experience. Direct, indirect, and cumulative effects are analyzed for each resource topic carried forward. For each resource topic and for each of the two alternatives, the effects of the alternative and the effects of other past, present, and reasonably foreseeable projects are analyzed separately. These analyses are then combined in a final "Conclusions" subsection that describes the anticipated net effects of the combination. Potential effects are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes the classification of the impact as either beneficial or adverse, direct or indirect:
  - *Beneficial*: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
  - *Adverse*: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
  - *Direct*: An effect that is caused by an action and occurs in the same time and place.
  - *Indirect*: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.
- **Context** describes the area or location in which the impact will occur. Are the effects site-specific, local, regional, or even broader?
- **Duration** describes the length of time an effect will occur, either short-term or long-term:
  - *Short-term* effects generally last only during construction, and the resources resume their pre-construction conditions following construction.
  - *Long-term* effects last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.
- **Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment.

Cumulative Impact Scenario

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative effects in the decision-making process for federal projects. Cumulative effects are defined as "the impact on the environment which results from the incremental impact 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" (40 CFR 1508.7). Cumulative effects are considered for both the no-action and preferable alternative.

Cumulative effects were determined by analyzing the effects of other past, present, and reasonably foreseeable future actions separately from the preferable alternative, then discussing the combined effect in the Conclusion subsection. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at BNR and, if applicable, the surrounding region. Because the scope of this project is relatively small, the geographic and

temporal scope of the cumulative analysis is similarly small. The geographic scope for this analysis includes actions within BNR's boundaries, while the temporal scope includes projects within a range of approximately ten years. Given this, the following project and temporary action were identified for the purpose of conducting the cumulative effects analysis:

- **Lost Valley Trail Improvements –** BNR recently completed upgrading the Lost Valley Trail from the point at which the trail emerges from the Clark Creek floodplain, approximately 720 feet from the parking area, to the fork in the trail just downstream from Eden Falls, to make it barrier-free for the mobility impaired. BNR also rebuilt the stone steps from Eden Falls up to Eden Cave and installed a handrail on the downhill side at the steepest and most exposed portions of this trail segment.
- **Temporary campground closure –** BNR imposed a temporary, indefinite closure of the campground at Lost Valley immediately following the flood in 2011 out of concern for public safety. Since then, the campsites have begun to naturally revegetate themselves.

Soils

Intensity Level Definitions

According to the NPS's Management Policies 2006, the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources (NPS 2006).

Context: Site-specific – Activities that would result in effects that occur in the immediate vicinity of the Lost Valley Campground and trail.

Local – Activities that would result in effects beyond the immediate vicinity of the Lost Valley Campground and trail, but are limited to the Clark Creek basin.

Regional – Activities that would result in effects beyond the Clark Creek basin, but contained within Buffalo National River.

Duration: Short-term – Recovers in less than three years.

Long-term – Takes more than three years to recover and can be considered a permanent effect.

Intensity: Negligible – The removal, erosion, or compaction of, or improvements to, soils would either be undetectable or if detectable, would have effects that would be considered slight and short-term.

Minor – The removal, erosion, or compaction of, or improvements to, soils would be measurable, although the changes would be small and barely noticeable. No mitigation measure would be necessary.

Moderate – The removal, erosion, or compaction of, or improvements to, soils would be measurable and apparent. Mitigation measures would be necessary for adverse effects and the measures would likely be successful. Without mitigation, adverse effects would result in permanent loss and/or largely compromise the integrity of the resource. In the case of beneficial effects, no mitigation would be necessary.

Major – The action would result in a noticeable adverse change in soils through removal, erosion, or compaction. Mitigation measures would be necessary and their success would not be guaranteed. In the case of beneficial changes, no mitigation would be necessary.

Effects of Alternative A (No-Action Alternative)

Soils within the project area, specifically within the trail and campground, would continue to be subject to erosion from flooding and compaction by foot traffic. This would have a direct, site-specific, long-term, and minor, adverse effect on soils.

Cumulative Effects

Other trail improvements already constructed at Lost Valley and natural revegetation that has already occurred in the campground as a result of the temporary closure, are having a direct, site-specific, long-term, and minor, beneficial effect on soils by reducing soil erosion and improving rainwater storage and filtration.

Conclusion

The No Action Alternative, when combined with the cumulative effect of other trail improvements already completed and the temporary closure of the campground, would result in a net direct, site-specific, long-term, and negligible, adverse effect on soils due to continued erosion and compaction of soils in the existing trail alignment and campground where they are located within the floodplain of Clark Creek.

Effects of Alternative B (Preferable Alternative)

Grading and realignment of the trail present the greatest risk of soil erosion should a heavy storm event occur during construction. Trail construction in the fall, when heavy storm events are rare, the employment of standard Best Management Practices, and completing ground-disturbing activities as quickly as possible would minimize the potential for erosion. The proposed new alignment of the first 720 feet of the Lost Valley Trail would result in 0.1 acres of permanent effects to soils by covering them with a new barrier-free trail surface. The installation of culverts and pipes at drainage locations along the trail would reduce the potential for erosion because the new trail surface would not impede natural drainage patterns. The natural restoration of the existing trail alignment to a revegetated condition would have a beneficial effect on soils in the existing alignment by protecting it from erosion and allowing it to recover from compaction over the long-term. Realigning the trail so it is outside the floodplain would have direct, site-specific, long-term, and minor, beneficial effects by improving storage and filtration and reducing soil erosion along the existing trail alignment.

By permanently allowing the campsites to naturally revegetate, the soils located in the campsites would be able to naturally recover from compaction that has occurred as a result of trampling. This would have direct, site-specific, long-term, and minor, beneficial effects by improving rainwater storage and filtration and reducing potential erosion during storm events.

Cumulative Effects

The cumulative effect of recently completed trail improvements would be the same as described for the Effects of Alternative A (No Action Alternative), above.

Conclusion

While there are some potential adverse effects during and immediately after construction, specifically from the removal of vegetation and roots along the proposed new trail alignment, these effects would not be sufficiently negative to offset the benefits that would be gained from stabilizing the trail outside of the floodplain and allowing the existing trail and campground to naturally revegetate. The preferable alternative, when combined with the cumulative effects of the existing trail improvements and campground closure would have direct, site-specific, long-term, and moderate, beneficial effects to soils by reducing soil erosion and improving rainwater storage and filtration.

Vegetation

Intensity Level Definitions

According to the NPS's Management Policies 2006, 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).

Context: Site-specific – Activities that would result in effects that occur in the immediate vicinity of the Lost Valley Campground and trail.

Local – Activities that would result in effects beyond the immediate vicinity of the Lost Valley Campground and trail, but are limited to the Clark Creek basin.

Regional – Activities that would result in effects beyond the Clark Creek basin, but contained within Buffalo National River.

Duration: Short-term – Recovers in less than three years.

Long-term – Recovers in more than three years or permanent loss of vegetation.

Intensity: Negligible – Some individual plants could be adversely affected, but there would be no effect on native species populations. The effects would be on a small scale and generally imperceptible. Additionally, the action would not result in the spread of noxious weeds. Beneficial effects would be imperceptible.

Minor – Some individual native plants and a minor portion of that species' population or the local plant community would be adversely affected. Mitigation to offset adverse effects could be required and would be effective. Additionally, the action could potentially result in the spread of noxious weeds. The change, whether adverse or beneficial, would be small, localized, barely noticeable, and of little consequence.

Moderate – A sizable segment of a species' population or plant community would be affected over the long-term. Mitigation to offset adverse effects could be extensive, but would likely be successful. Additionally, the action would likely result in the spread of noxious weeds without proper mitigation. The change or effects would be measurable, noticeable, and of consequence to the species or local plant community, but limited to the immediate vicinity of the action.

Major – An action that could result in considerable long-term effects on native plant populations and could affect a relatively large area inside or outside the park. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed. Additionally, the action could result in a noticeable invasion of noxious weeds. The change would be highly noticeable, readily measurable, and result in a severely adverse or highly beneficial effect with possible permanent consequences for the biotic community.

Effects of Alternative A (No-Action Alternative)

Vegetation along the existing trail alignment would not be affected. Vegetation that has begun to grow up in the campground would be once again removed after the temporary closure is lifted. The reduction in vegetation in the campground area would have a direct, site-specific, short- and long-term, minor adverse effect on vegetation at Lost Valley.

Cumulative Effects

Reduced off-trail hiking by visitors along the segment of the trail where improvements have already been completed along with better drainage control is resulting in the reestablishment of vegetation in formerly trampled and eroded areas. This is having an indirect, site-specific, long-term, minor, beneficial effect on vegetation at Lost Valley.

Conclusion

The No Action Alternative, when combined with the cumulative effect of the recently completed trail improvements, would result in net direct and indirect, site-specific, short- and long-term, negligible adverse effects to vegetation.

Effects of Alternative B (Preferable Alternative)

Approximately 0.1 acre of vegetation would be cleared to reroute the trail out of the floodplain. No large trees would be removed in the process. The existing trail segment within the floodplain, approximately 0.1 acre, would be abandoned and allowed to naturally revegetate. The campsites would continue to naturally return to their original, undeveloped condition, blending back in with the surrounding forest; therefore, the preferable alternative would be expected to result in a net increase in vegetation at Lost Valley. This would result in a direct, site-specific, long-term, and minor, beneficial effect on vegetation at Lost Valley.

Cumulative Effects

The cumulative effect of recently completed trail improvements would be the same as described for the Effects of Alternative A (No Action Alternative), above.

Conclusion

The preferable alternative, when combined with the cumulative effect of the recently completed trail improvements, would result in net direct and indirect, site-specific, long-term, and minor, beneficial effects on vegetation at Lost Valley.

Special Status Species

Intensity Level Definitions

Section 7 of the Endangered Species Act defines the responsibilities of federal agencies considering activities that have potential for adversely affecting federally protected or sensitive species. Agencies are required to determine if a proposed action may have an adverse effect on protected species and, if so, consult with the USFWS to identify appropriate mitigation. The State of Arkansas also maintains a list of State protected and sensitive species. The term “sensitive species”, for the purposes of this EA, refers to those species not specifically afforded protection by either the State or federal governments, but that could potentially be protected in the near future; thus, planning should include efforts to avoid adverse effects to these species in order not to further contribute to their decline. The thresholds for this impact assessment are as follows:

Context: Site-specific – Activities that would result in effects that occur in the immediate vicinity of the Lost Valley Campground and trail.

Local – Activities that would result in effects beyond the immediate vicinity of the Lost Valley Campground and trail, but are limited to the Clark Creek basin.

Regional – Activities that would result in effects beyond the Clark Creek basin, but contained within Buffalo National River.

Duration: Very short-term – the species would be expected to recover fully within one year.

Short-term – the species would be expected to recover fully within two years.

Long-term – the species would take longer than two years to fully recover, if at all.

Intensity: Negligible – The action may result in a change to individuals or a population of a special status species or designated critical habitat, but the change would be so small that it would not result in a detectable adverse effect to the species.

Minor – The action may result in a change to individuals or a population of a special status species or designated critical habitat. The change would be measurable, but would not be likely to adversely affect the species.

Moderate – The action would result in some change to a population of a special status species or designated critical habitat. The change would be measurable and likely to adversely affect the species. Beneficial effects would be barely to readily perceptible, and measurable.

Major – The action would result in a noticeable change to a population of a special status species or designated critical habitat. The action would result in a take, as defined by the Endangered Species Act, of one or more individuals of the species. The change to the population would be measurable and would adversely affect the species. Beneficial effects would be noticeable and measurable.

Effects of Alternative A (No-Action Alternative)

There would be no effects to bald eagles, bats, migratory birds, or special status plant species at Lost Valley because there would be no change to the existing conditions. The lack of construction activities beyond regular trail maintenance would preclude the possibility of any adverse effects to the three State Inventory Element plant species.

Rabbitsfoot mussels and critical habitat for this species in Buffalo River may potentially be affected by existing levels of erosion during major flood events at Lost Valley. If so, erosion would continue to have an indirect, potentially regional (as defined above), long-term, and negligible, adverse effect on rabbitsfoot mussels in Buffalo River downstream of the confluence with Clark Creek, because levels of erosion would remain unchanged.

Cumulative Effects

The recently completed Lost Valley trail improvements are having no observable effect on bald eagles, bats, migratory birds, or special status plant species.

Rabbitsfoot mussels in Buffalo River may be experiencing slightly less sedimentation as a result of the trail improvements already completed; however, it is unlikely that such improvements are measurable or perceptible. This would be an indirect, regional, long-term, and negligible beneficial effect on rabbitsfoot mussels in the Buffalo River mainstem.

Conclusion

There would be no change in effects to special status plant species, bald eagles, bats, migratory birds, or rabbitsfoot mussels.

Effects of Alternative B (Preferable Alternative)

Placement of the new trail alignment along a path that avoids large trees and sensitive plants would eliminate the potential for effects to bats and sensitive plants. No bald eagles or migratory birds, or active nests, would be taken and there would be no effect to these species.

Grading and realignment of the trail present the greatest risk of soil erosion should a heavy storm event occur during construction. Soil erosion during a heavy storm event would cause

increased sedimentation in the mainstem of Buffalo River. Such sedimentation could potentially have an adverse effect on rabbitsfoot mussels in Buffalo River downstream of the confluence with Clark Creek. Trail construction in the fall, when heavy storm events are rare, the employment of standard Best Management Practices, and completing ground-disturbing activities as quickly as possible would all but eliminate the potential for such erosion and sedimentation during construction. Once construction has been completed, the preferable alternative would ultimately reduce soil erosion and subsequent sedimentation by allowing soils along the existing trail to recover from compaction and become naturally revegetated. Future flood events would be expected to result in less sediment reaching Buffalo River. This would potentially have an indirect, regional, long-term, and negligible beneficial effect on rabbitsfoot mussels in Buffalo River.

Cumulative Effects

The cumulative effect of recently completed trail improvements would be the same as described for the Effects of Alternative A (No Action Alternative), above.

Conclusion

For reasons stated above, the preferable alternative, when combined with the other trail improvements that have already been completed at Lost Valley, would have no effect on bald eagles, bats, migratory birds, or special status plant species and would have an indirect, regional, long-term, and potentially minor, beneficial effect on rabbitsfoot mussels in the Buffalo River mainstem downstream of the confluence with Clark Creek.

Visitor Use and Experience

Intensity Level Definitions

BNR was established to preserve and protect the river for the benefit and enjoyment of the public. The methodology used for assessing effects to visitor use and experience is based on how the proposed improvements would affect the visitor, particularly with regard to the visitors' use and enjoyment of the river and natural environment. The thresholds for this impact assessment are as follows:

Context: Site-specific – Activities that would result in effects that occur in the immediate vicinity of the Lost Valley Campground and trail.

Local – Activities that would result in effects beyond the immediate vicinity of the Lost Valley Campground and trail, but are limited to the Clark Creek basin.

Regional – Activities that would result in effects beyond the Clark Creek basin, but contained within Buffalo National River.

Duration: Short-term – the effects would not be noticeable and visitors would be unlikely to express an unsolicited opinion after one year.

Long-term – the effects would continue to be noticeable and visitors would be likely to express an unsolicited opinion after one year.

Intensity: Negligible – Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.

Minor – Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate – Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major – Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Effects of Alternative A (No-Action Alternative)

Although regular trail maintenance would likely alleviate most of the safety hazards posed by the existing trail, no pedestrian bridge and no upgrades to the lower trail for the mobility impaired would occur under this alternative; thus, the mobility impaired would continue to be limited to the parking lot. The campground would be reopened and continue to present a public safety hazard during major flood events. Visitors that have enjoyed using the campground would appreciate being able to use the campground once again so long as they are not caught on the wrong side of Clark Creek during a major flood event. The benefits to visitor use and experience from reopening the campground would be offset by the continued limitation of the mobility impaired to the parking area and safety hazard from major flood events. Consequently, this alternative would have direct, site-specific, long-term, and potentially moderate, adverse effects on visitor use and experience at Lost Valley.

Cumulative Effects

The recently completed trail improvements are designed to improve the visitor experience at Lost Valley for a larger segment of potential users (namely the mobility impaired); however, without completion of the improvements to the initial segment of the trail currently located in the floodplain of Clark Creek, the completed improvements can only contribute to an improved visitor experience through an improvement in the visual aesthetics of the facility and safety on the steep portion of the trail that leads up to Eden Cave. These two improvements are providing direct, site-specific, long-term effects, that range from negligible to potentially moderate and beneficial, depending upon the visual sensitivity of the individual visitor using the facility, and moderate, beneficial effects with regard to the improved safety on the steep portion of the trail up to Eden Cave.

Conclusion

Regarding safety, no action, when combined with recently completed trail improvements, would result in a net of no effects to visitor use and experience. The combination of an improved visual experience on the completed portion of the trail improvements, limitation of the mobility impaired to the parking area, and reopening of the campground under the No Action Alternative, would have a net direct, site-specific, long-term, and minor, beneficial effect on visitor use and experience at Lost Valley.

Effects of Alternative B (Preferable Alternative)

BNR would keep the trail open throughout construction by routing hikers around daily work areas. Construction would have a direct, site-specific, short-term, and negligible, adverse effect on visitor use and experience. Upon completion, the improvements at Lost Valley would expand the use of the trail to include the mobility impaired. The use of a natural or nontoxic soil stabilizer instead of concrete or asphalt for the ABA compliance improvements would make it possible to maintain the natural character of the area and the trail. This would have direct, site-specific, long-term, and minor, beneficial effects on visitor use and experience. The closure of the campground at Lost Valley may cause a minor inconvenience to some visitors, but would have the beneficial effect of removing the safety hazard resulting from campsites located within the floodplain. The campground closure would also reduce noise and light associated with overnight use of the area. Replacement of the bridge over Clark Creek would improve the visitor experience by providing a safer and more reliable means of crossing the creek. Permanent

campground closure and bridge replacement would be expected to have a direct, site-specific, long-term, and moderate, beneficial effect on visitor use and experience. The relocation of the trail alignment outside the floodplain would not be expected to have any effect on visitor use and experience.

Cumulative Effects

The cumulative effect of recently completed trail improvements would be the same as described for the Effects of Alternative A (No Action Alternative), above.

Conclusion

Noise and dust from construction activities would adversely affect visitor use and experience; however, all construction-related effects would be temporary and cease following construction activities. Construction activities would result in temporary inconveniences to visitors; however, there are no plans to close the areas while construction is going on. Construction would have a direct, site-specific, short-term, and minor, adverse effect on visitor use and experience. Most of the proposed improvements are driven by visitor needs. The benefits of expanded access to the trail by the mobility impaired, along with an improved visual setting, reduced safety hazard, and reduced light and noise at night time, would be partially offset by the inconvenience to some visitors who would prefer to continue camping at the campground. These factors would be expected, when combined with the already completed trail improvements, to result in a net direct, site-specific, long-term, and moderate, beneficial effect on visitor use and experience at Lost Valley.

CONSULTATION AND COORDINATION

Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from BNR. Interdisciplinary team members met on September 20, 2012 and October 1, 2012 to discuss the purpose and need for the project; various alternatives; potential environmental effects; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed construction site. The results of the September and October 2012 meetings are documented in this environmental assessment.

External Scoping

External scoping was conducted to inform the public about the proposal to construct facilities improvements at BNR and to generate input on the preparation of this environmental assessment. This effort was initiated with the distribution of a scoping letter, which was bulk-mailed to over 200 residents, federal and State agencies, affiliated Native American tribes, local governments, and local news organizations. Scoping information was also posted on the BNR website. With this press release, the public was given 30 days to comment on the project.

During the scoping period, three responses were received from the public through online comments. One comment objected to the closure of the campground. One comment proposed moving the campground to one of the adjacent hayfields outside of the floodplain. One comment requested that the new trail alignment avoid known populations of spring wildflowers. No other public comments were received.

Agency Consultation

In accordance with the Endangered Species Act, the NPS contacted the U.S. Fish and Wildlife Service with regard to federally listed special status species, and in accordance with NPS policy, the BNR also contacted the Arkansas Game and Fish Commission and the Arkansas Natural Heritage Commission with regard to state-listed species. The results of these consultations are described in the *Special Status Species* section in the *Purpose and Need* chapter.

In accordance with Section 106 of the National Historic Preservation Act, the NPS sent a letter providing the Arkansas Historic Preservation Program State Historic Preservation Officer an opportunity to comment on the effects of this project. The results of this consultation are described in the *Cultural Resources* section in the *Affected Environment and Environmental Consequences* chapter.

Native American Consultation

Ten Native American tribes were contacted at the beginning of this project to determine if there were any ethnographic resources in the project area and if they wanted to be involved in the environmental compliance process, including:

- Absentee Shawnee
- Caddo Indian Tribe of Oklahoma

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

None of these tribes responded.

Environmental Assessment Review and List of Recipients

The environmental assessment will be released for public review in March of 2013. To inform the public of the availability of the environmental assessment, the NPS will publish and distribute a letter to various agencies, tribes, and members of the public on BNR's mailing list, as well as publish a press release in local and regional newspapers. Copies of the environmental assessment will be provided to interested individuals, upon request. Copies of the document will also be available for review at the BNR Headquarters in Harrison, Arkansas and on the internet at http://parkplanning.nps.gov/buff.

The environmental assessment is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the NPS address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the environmental assessment, as needed.

List of Preparers

Preparers

From the NPS, BNR, Arkansas:

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- Caven Clark, Chief, Interpretation and Cultural Resource Management
- William Osterhaus, Chief, Facilities Maintenance
- Carl David Scott, Botanist
- Faron Usrey, Hydrologist/Aquatic Ecologist
- Melissa Baier, Archeologist
- Charles Bitting, Geologist/NEPA Specialist
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- Lee Buschkowsky, Upper District Ranger

Contributors

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Appendix A
Tribal and Agency Correspondence

PDF files delivered separately

Appendix B
Buffalo National River Visitation Statistics

PDF files delivered separately