

National Park Service
U.S. Department of the Interior

Buffalo National River
Arkansas



Lost Valley Road and Parking Relocation Environmental Assessment



ENVIRONMENTAL ASSESSMENT for the LOST VALLEY ROAD AND PARKING RELOCATION at BUFFALO NATIONAL RIVER

Arkansas

SUMMARY

The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA), proposes to remove and relocate a portion of Lost Valley Road, parking area, and trailhead, located in Newton County, Arkansas. The existing parking area and road are repeatedly damaged during storms due to their proximity to Clark Creek. This Environmental Assessment (EA) examines the No Action Alternative and the Action Alternative. The Action Alternative would relocate the parking area, trailhead, and a portion of the entrance road. The Architectural Barriers Act (ABA)-accessible portion of the existing Lost Valley Trail would also be repaired. The Action Alternative is the Preferred Alternative. The Action Alternative would have a beneficial impact on water quality and species of special concern due to the reduction in the sedimentation of Clark Creek and restoration of riparian area. The Action Alternative would also have a beneficial impact on visitor use and experience due to the more sustainable access and parking. The Action Alternative would have impacts on the cultural landscape due to the changes to circulation patterns within the Lost Valley area; however, there would not be any adverse effect on the contributing elements that make the Big Buffalo Valley Historic District eligible for listing on the National Register of Historic Places.

This plan fulfills a park priority for facility asset management, resource management, and visitor experience at Buffalo National River and serves as a component of the park's planning portfolio. This follows the NPS's "Planning Portfolio" construct, consisting of a compilation of individual plans, studies, and inventories, which together guide park decision making. The planning portfolio enables the use of targeted planning products (such as this one) to meet a broad range of park planning needs, a change from the previous NPS focus on standalone general management plans. The general management plan remains a critical piece of the planning framework and will be revised in a timely manner through the park's planning portfolio.

PUBLIC COMMENT

This EA will be on public review from December 4, 2017 through January 17, 2018. During this 45-day period, copies of the EA will be available for review at the Buffalo National River Visitor Center, and the Boone County Library located at 221 W. Stephenson Avenue, Harrison, AR 72601. An electronic version of this document can be found on the NPS's Planning Environment and Public Comment (PEPC) website at <http://parkplanning.nps.gov/buff>. This site provides access to current plans, environmental impact analyses, and related documents on public review. An electronic version may also be found at the Federal Highway Administration, Eastern Federal Lands Highway Division's website at <https://flh.fhwa.dot.gov/projects/ar/lost-valley/>.

If you wish to comment on the EA, you may submit comments through the PEPC website or mail comments to: Kevin G. Cheri, Superintendent Buffalo National River 402 N. Walnut, Suite 136, Harrison, AR 72601. 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. While 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. We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

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CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

The Lost Valley area of Buffalo National River near Ponca, Arkansas was damaged by rain and subsequent flooding in 2015. The potential for future flooding presents a serious challenge to the maintenance of Lost Valley Road and to the safety of visitors. This Environmental Assessment (EA) presents the analysis of the proposed action and the no action alternatives. In addition to presenting the alternatives, this EA also discloses the potential impacts of the implementation of those alternatives and documents the agency's decision-making process.

Chapter 1 presents the purpose and need for the action, discusses the location and background of the project, identifies related plans and planning, and provides information regarding the scoping completed as a part of the project development process. Chapter 2 presents the alternatives proposed to meet the purpose and need of the action, and discusses alternatives that were dismissed from further consideration. Chapter 3 provides information regarding the resources present in the study area that would be impacted by the proposed action, and also discloses the impacts of each alternative to the resources. Chapter 4 documents the public involvement process throughout this project and provides a list of agencies and persons consulted. Chapter 5 presents the list of references.

The preparation of an EA by a Federal agency taking an action, and the contents of an EA are the result of legislation and implementing regulations issued to date. In 1969, the United States Congress passed the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) to establish a national policy,

“...which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; ...”

NEPA also established the Council on Environmental Quality (CEQ) as an agency of the Executive Office of the President. In enacting NEPA, Congress recognized that nearly all Federal activities affect the environment in some way. Section 102 of NEPA mandates that before Federal agencies make decisions, they must consider the effects of their actions on the quality of the human and natural environment. NEPA assigns CEQ the task of ensuring that Federal agencies meet their obligations under the Act.

The CEQ regulations (40 CFR 1500-1508) describe the means for Federal agencies to develop the Environmental Impact Statements (EIS's) mandated by NEPA in Section 102. The CEQ regulations developed the EA to be used when there is not enough information to decide whether a proposed action may have significant impacts. If an EA concludes that a Federal action will result in significant impacts, the Agency is required to prepare an EIS or alter the action proposed. Otherwise, the Agency is directed to issue a Finding of No Significant Impact (FONSI).

Section 1508.09 of the CEQ regulations states that the purposes of an EA are to:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI.
- Aid an Agency's compliance with the Act when no environmental impact statement is necessary.
- Facilitate preparation of a statement when one is necessary.

Preparation of an EA is also used to aid in an Agency's compliance with Section 102(2)E of NEPA, which requires an Agency to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

This EA was prepared to meet the NEPA requirements of both the National Park Service (NPS) and Federal Highway Administration (FHWA). The Department of the Interior (of which the NPS is part) issued its NEPA regulations as Part 516 of its Departmental Manual (516 DM), last revised in March 2004. In January 2011, the NPS updated the 2001 edition of Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-Making and the accompanying Handbook 12. The NPS NEPA handbook was released in 2015. The FHWA's NEPA regulations are codified at 23 CFR Part 771.

Applicable Laws and Regulations

Coordination or consultation, as appropriate, in accordance with other laws and regulations was been completed during the development of the EA to help guide the development of the proposed action, determine impacts of the proposed action, and identify mitigation measures. Applicable laws include the Clean Water Act of 1972 (33 USC 1251), Endangered Species Act of 1973 (16 USC 35), and National Historic Preservation Act of 1966 (16 USC 470), National Park Service Organic Act (54 USC 1), and Buffalo National River Establishing Act (P.L. 92-237), as codified in the Code of Federal Regulations. A detailed list of applicable Executive Orders, Regulations and policies are provided in Appendix A.

NPS Management Policies 2006, Section 1.4: The Prohibition on Impairment of Park Resources and Values

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of Interior and the NPS to manage units "to conserve the scenery and the natural and historic objects and wild life therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (16 USC § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC 1a-1).

NPS Management Policies 2006, Section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirements (generally enforceable by

the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the NPS. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The NPS has discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park (NPS 2006 sec. 1.4.3). However, the NPS cannot allow an adverse impact that would constitute impairment of the affected resources and values (NPS 2006 sec.1.4.3). An action constitutes an impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006 sec.1.4.5). To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006 sec 1.4.5). A determination of impairment will be made only for the selected alternative, and will be appended to the decision document.

Project Site Description

Buffalo National River contains 95,730 acres within its established boundary (NPS Stats, 2011) and is located in Baxter, Marion, Newton, and Searcy Counties in northern Arkansas (Figure 2). It is one of the few rivers in the continental United States that is undammed and was declared the first national river by the U.S. Congress in 1972 (Public Law 92-237, March 1, 1972) for the purposes of “...conserving and interpreting an area containing unique scenic and scientific features, and preserving as a free-flowing stream an important segment of the Buffalo River in Arkansas for the benefit and enjoyment of present and future generations...” Buffalo National River is managed by the NPS and provides many types of recreation, including hiking, boating, camping and fishing. Buffalo National River is significant for its free-flowing river, karst geology, cultural landscape, unique ecosystem and exceptional recreation setting.

Lost Valley is a point of interest located at the western end of the Buffalo National River (Figure 1). The Lost Valley area is one of the most popular destinations for visitors of the Buffalo National River, receiving approximately 77,000 visitors per year. The Lost Valley Trail is a 6-foot wide aggregate surfaced trail that starts at the Lost Valley parking area, and continues for approximately 1.2 miles. The trail ends at Eden Falls Cave, which is a popular destination for hikers. The Lost Valley area also features a pavilion, vault and flush toilets, and drinking water from March to October (Figure 2).

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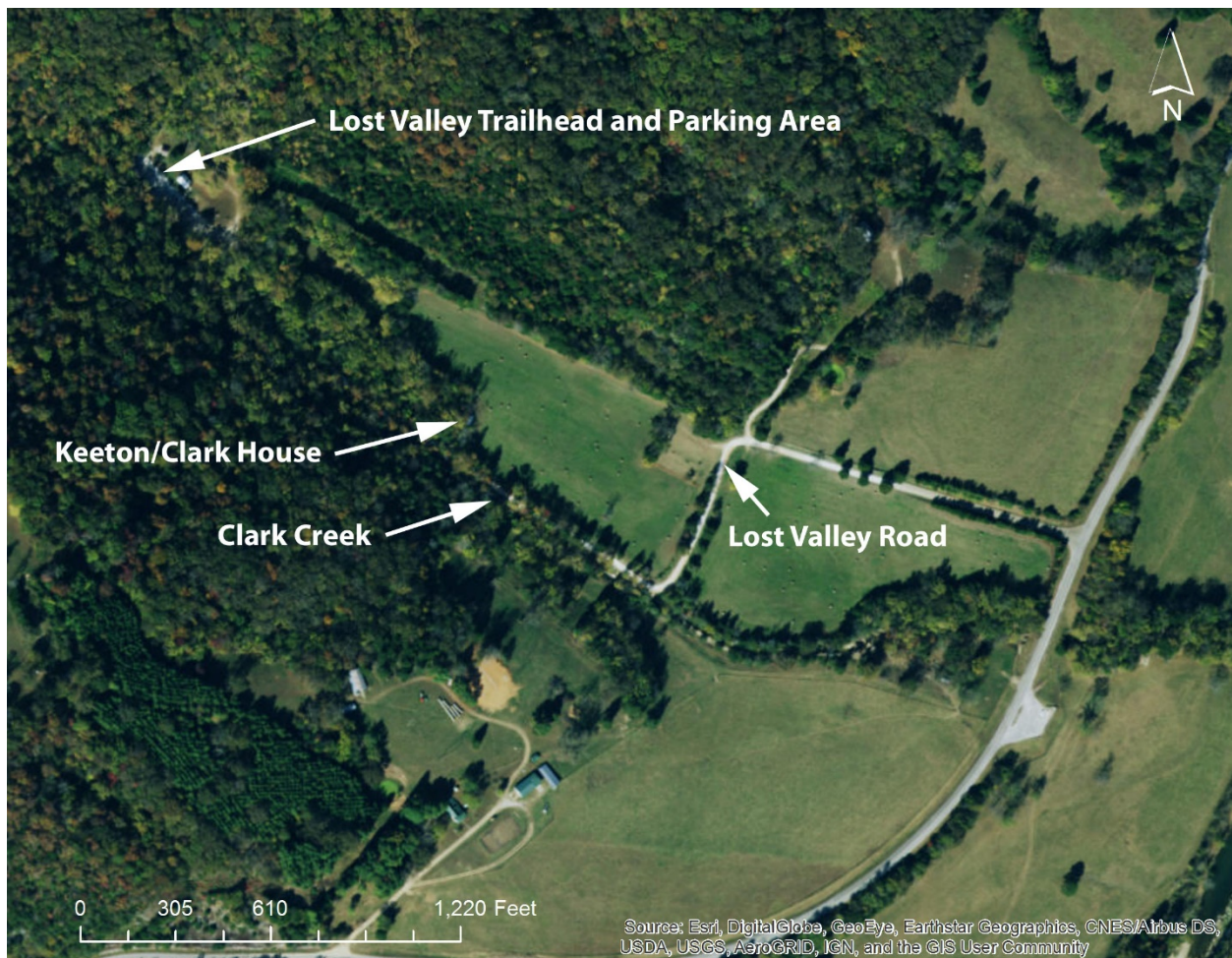


Figure 2. Project Site

Access to the trailhead is provided via Newton County Road 1015 (Lost Valley Road). Lost Valley Road is a two-lane road located west of State Highway 43. The road is bordered by Clark Creek to the south, and by a narrow floodplain and hilly terrain to the north.

The first 0.10 miles of the road is paved; however, the remaining 0.45 mile is a gravel road. The road is approximately 16 feet wide, with little to no shoulders (Figure 3). The annual average daily traffic (AADT) on the road between 2011 and 2016 was 73 vehicles. The AADT is exceeded during the months of



Figure 3. Lost Valley Road

March, May, June, August, September and October. The months of March and October have the highest average daily traffic (ADT) with 125 and 119, respectively, according to NPStats traffic counts for Lost Valley Road from 2011 through 2016 (National Park Service n.d.).

The existing parking area is 21,600 square feet in size, and provides informal parking for approximately 70 vehicles. The trailhead is located in the southwest corner of the parking area (Figure 4).



Figure 4. Layout of Existing Parking Area

PURPOSE AND NEED

The purpose of this project is to provide safe vehicular access to the Lost Valley Trailhead while minimizing adverse impacts to Clark Creek, the Buffalo River, and the surrounding environment.

The proposed action is needed because a section of Lost Valley Road and the parking area are located within the floodplain of Clark Creek, which causes the road and parking area to be repeatedly damaged during storm events. Lost Valley Road runs adjacent and parallel to Clark Creek for a distance of approximately 1,500 feet (Figure 5).



Figure 5. Clark Creek Runs Alongside Lost Valley Road

Storm events frequently result in flash flooding and the discharge of vehicle contaminants, silt, sand, gravel and clay roadway material directly into Clark Creek, where it is transported a short distance downstream to the Buffalo River. The rapidly fluctuating water levels of Clark Creek present serious challenges to the maintenance of the road and the safety of visitors. During the spring and summer, frequent heavy rain and flooding overwhelms drainage areas, causing widespread issues with the road and ditch lines, which are frequently washed out. Most recently, a storm in May of 2015 caused significant damage to the roadway, parking area, and trail (Figure 6). Damage to the road and parking area makes the trail and facilities inaccessible to visitors during flood events, and difficult to access afterwards until repairs can be made.



Figure 6. Lost Valley Road Damage from May 2015 Storm

Project Background

The improvement of the Lost Valley Area to better serve visitors has been an ongoing process. A section of the Lost Valley Trail was upgraded in 2012 to make it barrier-free to comply with standards set by the Architectural Barriers Act (ABA). The upgraded section did not include the first 720 feet of the trail (measured from Clark Creek). The Lost Valley Trail & Campground EA for additional improvements to the Lost Valley Trail was completed in 2013. Under this project, a new pedestrian bridge over Clark Creek would be installed and the first 720 feet of the trail from the new bridge would be realigned and upgraded to make it barrier-free. Also included in the EA was the permanent closure of the campground at Lost Valley and upgrading the amphitheater to make it barrier-free (National Park Service 2013). The new bridge over Clark Creek has not yet been constructed.

Abnormally high rain events occurred in May of 2015. The average rainfall for Newton County in May was exceeded by over six inches (National Weather Service 2015). A disaster declaration was issued by the Arkansas State Governor for Newton County on May 11, 2015. The repairs for the damage at Lost Valley were determined to be eligible for funding by the Emergency Relief for Federally Owned Roads (ERFO) program. The ERFO program was established to assist federal agencies with the repair or reconstruction of federal lands transportation facilities that are open to public travel and are found to have suffered serious damage by a natural disaster occurring over a wide area. Recurring damage to the trail, road and parking area since its initial construction has led the NPS to propose moving the facilities from their current location to minimize future damage.

The Boxley Valley Comprehensive Area Plan is also underway at this time to look at recreational use of the Boxley Valley area. The Boxley Valley is a 12.34 square mile area that follows the Buffalo River and Highway 43 from the Ponca area south for a distance of approximately 4.3 miles. Lost Valley is located within Boxley Valley. This EA will focus only on the ERFO-eligible repairs of the road, parking area, and trail in Lost Valley.

Scoping

The CEQ guidelines (1978) for implementing the NEPA and the NPS's NEPA guidelines contained in Director's Order # 12: *Conservation Planning, Environmental Impact Analysis and Decision Making Handbook* (National Park Service 2015) provide the framework for scoping. Scoping is an early and open process to: determine important issues; eliminate issues that are not important or relevant; identify relationships to other planning efforts or documents; define a time schedule for document preparation and decision-making; and, define purpose and need, agency objectives and constraints, and the range of alternatives. Information about the proposed project was made available to the public on the NPS's Planning, Environment, and Public Comment (PEPC) website during the public scoping comment period, from August 8, 2016 to September 9, 2016. No comments were received from the public. Scoping letters were also sent to local, State and Federal stakeholders, including the Arkansas Department of Parks & Tourism, Arkansas Game & Fish Commission, the United States Fish and Wildlife Service (USFWS), and the Arkansas Historic Preservation Program. Responses were received from the USFWS, the Arkansas Historic Preservation Program and the Arkansas Department of Parks & Tourism. For further scoping and public participation information, see Chapter 4: Public Involvement and Coordination and Appendix B: Agency Coordination Letters.

ISSUES AND IMPACT TOPICS

Issues as discussed in NEPA can be problems, concerns, conflicts, obstacles, or benefits that would result if the proposed action or alternatives, including the no-action alternative, are implemented. Issue statements describe the relationship between the potential impacts of an action and the specific resource that would be affected. Internal and external scoping was conducted for this EA to determine the extent and nature of issues and alternatives that should be considered during the NEPA review.

NEPA identifies issues as either “significant” or “insignificant.” Significant issues are explained as pivotal, or of critical importance. Insignificant issues were discussed, but are not explicitly dismissed. Significant issues identified through the scoping process were:

- Tree clearing for the relocation of the road and parking area could impact potential roost trees and foraging habitat used by Federally-listed bat species.
- Rain events repeatedly wash sediment and debris from the road and parking area into Clark Creek, which is a tributary of the Buffalo River. This results in sedimentation of the Buffalo River which impacts water quality. The Buffalo River provides critical habitat for the Federally-listed rabbitsfoot mussel.
- Reconfiguring the access to Lost Valley would change the circulation pattern and the appearance of the cultural landscape.
- Relocation of the parking area further away from the trailhead would change how visitors access the Lost Valley Trail.

Impact Topics Retained for Further Analysis

Species of Special Concern

In addition to NPS policies and management guidelines, the Endangered Species Act of 1973, as amended, provides for the protection of rare, threatened, and endangered species (floral and faunal). Federally-listed species regulated by the USFWS are found in Newton County, Arkansas, especially within the project area. The proposed action would require tree and vegetation clearing and ground disturbance that could potentially impact species of special concern. Therefore, *Species of Special Concern* was retained for further analysis in this EA.

Water Quality

The 2006 NPS Management Policies (National Park Service 2006), NPS Director’s Order #77: Natural Resources Management, along with the Clean Water Act and other Federal, State, and local regulations, provide general direction for the protection of surface and groundwaters. The existing road runs immediately adjacent to Clark Creek, which results in the washing of aggregate, soil, and vehicle pollutants directly into the creek. Ground disturbing activities during construction also have the potential to impact water quality. In order to relocate the existing road and parking area, construction work would be completed adjacent to Clark Creek. Three small tributaries to Clark Creek along the new sections of the entrance road and trail have the potential to be impacted by the project. Therefore, *Water Quality* was retained for further analysis in this EA.

Cultural Landscapes

As described in DO #28, a cultural landscape is “a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values” (DO #28, 87). Cultural landscapes are expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The Buffalo National River is a cultural landscape associated with the settlement of the Ozarks from the first prehistoric inhabitants to today’s living rural communities. Redevelopment of Lost Valley would impact the cultural landscape. Therefore, *Cultural Landscapes* was retained for further analysis in this EA.

Visitor Use and Experience

Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks (National Park Service 2006). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. Relocation of the road, parking area, and trail would impact visitor access and their experience in Lost Valley. Therefore, *Visitor Use and Experience* was retained for further analysis in this EA.

Impact Topics Dismissed From Further Analysis

The following impact topics were initially considered but were dismissed from further analysis because the resource is not present in the project site or because the proposed action would have no impact, have a negligible impact, or have a minor impact. A brief rationale for the dismissal of each impact topic is provided below.

Archeological Resources

The NPS defines an archeological resource as any material remains or physical evidence of past human life or activities that are of archeological interest, including the record of the effects of human activities on the environment. Archeological resources are capable of revealing scientific or humanistic information through archeological research (DO #28, 67). A Phase I Archeological Inventory of the area of potential effect was completed. No National Register of Historic Places (NRHP) archeological resources or NRHP-eligible resources were identified. Therefore, *Archeological Resources* was dismissed for further analysis in this EA.

Historic Structures, Districts, and Landmarks

A historic structure is defined by the NPS as “a constructed work, usually immovable by nature or design, consciously created to serve some human act” (DO #28, 113). For a structure to be listed on or eligible for listing on the NRHP, it must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials. The study area is located within the Big Buffalo Valley Historic District (also referred to as the Boxley Valley Historic District); however, the NPS development of the facilities at Lost Valley is noted as being modern structures that do not contribute to the district’s historic scene. The Keeton/Clark House, listed in the List of Classified Structures and Cultural Landscape Inventory being in poor condition, is located in Lost Valley; however, it would not be impacted by the project actions (Thomason and

Associates 2004). Therefore, *Historic Structures, Districts, and Landmarks* was dismissed as an impact topic for 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. It also 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 Buffalo National River. 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. Therefore, *Indian Trust Resources* was dismissed as an impact topic for further analysis in this EA.

Vegetation

The NPS policy is to protect the natural abundance and diversity of all naturally occurring communities. The 2006 NPS Management Policies (National Park Service 2006), NPS DO #77: Natural Resources Management, and other NPS and park policies, provide general direction for the protection of vegetation. Plant communities in the study area are comprised of cultivated fields (consisting of hay) and mixed hardwood forests. Tree species found in the project area include hickory (*Carya*), sweetgum (*Liquidambar styraciflua*), black locust (*Robinia pseudoacacia*), box elder (*Acer negundo*), American elm (*Ulmus americana*), umbrella magnolia (*Magnolia tripetala*), redbud (*Cercis canadensis*), and black gum (*Nyssa sylvatica*). The relocation of the existing road, parking area, and trailhead would impact approximately 2.61 acres of cultivated fields and 0.33 acre of mixed hardwood communities. Approximately 1.19 acres of the existing road and parking area would be revegetated with native species. An annual cover crop would be used in the seed mix to improve permanent stabilization of the disturbed area. Therefore, *Vegetation* was dismissed as an impact topic for further analysis in this EA.

Floodplains

Executive Order 13690, "Floodplain Management," and NPS Director's Order #77-2: Floodplain Management, require an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains (National Park Service 2003). The proposed action would require construction within the floodplain. The new location further away from Clark Creek would help to reduce the potential for damage from future flood events. A map of the Clark Creek floodplain in relation to the proposed action is provided in Appendix C. Impacts to the floodplain from the proposed action would be temporary in nature, and there would be no long-term permanent impacts. The proposed action would result in a higher quality floodplain. Restoration projects are exempt from the requirement to prepare a Statement of Findings. Therefore, *Floodplains* was dismissed as an impact topic for further analysis in this EA.

Visual Resources

The NPS 2006 Management Policies (National Park Service 2006) notes that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks. The Organic Act also states that units of the National Park System are charged with conserving park scenery, along with all the natural and cultural resources which contribute to

important views. In the evaluation of visual resources, both the visual character of the site and the quality of the viewshed are analyzed. A viewshed comprises the limits of the visual environment associated with the proposed action including the viewsheds within, into, and out of the site. The proposed action alternative does not propose any vertical construction that would significantly affect the Lost Valley viewshed. Therefore, *Visual Resources* was dismissed as an impact topic for further analysis in this EA.

Soils

The NPS policy is to protect the abundance and diversity of all naturally occurring soils. The 2006 NPS Management Policies (National Park Service 2006), NPS DO #77: Natural Resources Management and other NPS policies provide general direction for the protection of soils. The new portion of the entrance road is on previously undisturbed land, but would not include any action to significantly impact the soil. Further, the revegetation of the existing roadway and parking area would improve soil condition and drainage within the project area. Therefore, *Soils* was dismissed as an impact topic for further analysis in this EA.

Wetlands

Executive Order 13690, "Protection of Wetlands," and NPS Director's Order #77-1: Wetland Protection defines the NPS goal to maintain and preserve wetland areas (National Park Service 2008). National Wetlands Inventory (NWI) mapping was obtained for the study area. NWI maps show reconnaissance level information on the location, type and size of wetlands and deepwater habitat and are prepared from the analysis of high altitude imagery. No wetlands were shown as being present in the project area. Soil survey maps show that the study area is comprised primarily of Razort loam, occasionally flooded, and Ceda cobbly fine sandy loam, zero to three percent slopes, frequently flooded. These soils have hydrologic soil group ratings of B and A, respectively. Hydrologic soil group A has a high infiltration rate (low runoff potential) when thoroughly wet and consist mainly of deep, well drained to excessively drained sands and gravelly soils. Group B has a moderate infiltration rate when thoroughly wet, and consist of moderately deep and well drained soils. A survey for wetlands confirmed that no wetlands are present in the study area. Therefore, *Wetlands* was dismissed as an impact topic for further analysis in this EA.

Air Quality

The 1963 Clean Air Act (CAA), as amended, requires land managers to protect air quality. Section 118 of the CAA further requires parks to meet all Federal, State, and local air pollution standards, and NPS 2006 Management Policies (National Park Service 2006) addresses the need to analyze potential impacts to air quality during park planning. Although construction and demolition activities proposed would have some impacts to air quality, they would be short-term and negligible. Therefore, *Air Quality* was dismissed as an impact topic for further analysis in this EA.

Soundscape

The NPS Management Policies 2006 state that the NPS will preserve, to the greatest extent possible, the natural soundscapes of parks. Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and

volumes. This is the basis for determining the "affected environment" and impacts on a park soundscape. Traffic capacity would not increase as a result of this project, but there would be short-term minor impact to the soundscape from the presence of heavy equipment during construction. Therefore, *Soundscape* was dismissed as an impact topic for further analysis in this EA.

Environmental Justice

Executive Order 12898, "Federal 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 the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities (Clinton 1994).

Within a five-mile radius of the project, 94.9% of the persons were white based on the data from the 2010 U.S. Census of Population and Housing compared to 96% for Newton County and 78.4% for Arkansas (US Census Bureau 2015). Per EPA/CEQ Guidance (Final Guidance for Incorporating Environmental Justice Concerns in the EPA's NEPA Compliance Analysis and the CEQ's Environment Justice: Guidance under NEPA), a community minority population is greater than 50% or "meaningfully greater" than minority population percentage in the general population or other appropriate geographic area. The study area is therefore not a minority community.

The number of persons below the 2014 poverty level in Newton County was 20.1% and in Arkansas was 18.9% (US Census Bureau 2015). Per EPA/CEQ Guidance, a low-income community has a greater percentage of persons below poverty in the general population or other appropriate geographic area. The study area is therefore a low-income community. However, the proposed project would not acquire any land from property owners and would not have any disproportionate or adverse impacts on minority or low-income populations. Therefore, *Environmental Justice* was dismissed as an impact topic for further analysis in this EA.

CHAPTER 2: DESCRIPTION OF ALTERNATIVES

NEPA requires that Federal agencies conduct a careful, complete, and analytical study of the impacts resulting from proposals that have the potential to affect the environment, and to consider alternatives to those proposals, well before any decision is made. The two alternatives are the No Action Alternative, to continue current management, and the Action Alternative (NPS-preferred alternative). This chapter also includes mitigation measures which would be implemented under the Action Alternative and Alternatives Considered But Dismissed.

NO ACTION ALTERNATIVE

Under the No Action Alternative, no substantial improvements would be performed other than in accordance with routine maintenance operations. Routine road and trail maintenance operations include grading and brush removal. Emergency repairs and replacements may be necessary, particularly as the road and trail continue to degrade following extreme rain events. Analysis of the No Action Alternative is required as part of the NEPA process in order to provide a benchmark to compare what would happen to the environment if current management were continued into the future with other feasible alternatives.

ACTION ALTERNATIVE: RELOCATE EXISTING ROAD AND PARKING AREA

Under the Action Alternative, the parking area, trailhead, and a portion of the entrance road would be relocated. From the intersection of Highway 43 at Lost Valley, the entrance road would continue straight after approximately 900 feet (instead of turning to the south) through the existing field for an additional 650 feet to a new parking area. The new road alignment, consisting of two 10-foot lanes, would be graded and embankment material would be placed as needed. The road would be surfaced with six inches of aggregate. The relocated parking area would be constructed approximately 850 feet southeast of its current location, moving it outside of the Clark Creek floodplain. The 10-foot wide ABA access road, with access limited to vehicles with disabled placards/license plates and other authorized vehicles, would extend to a separate accessible parking area located adjacent to the pavilion and toilets. A new section of six-foot wide trail would be constructed from the new parking area to the future Clark Creek crossing location, and would be approximately 960 feet in length. This new section of trail would be designed to be barrier-free to accommodate use by disabled visitors. A stabilized-aggregate surface would be constructed on the new section of trail, similar to the surface of the existing accessible section of the Lost Valley trail. A commercially available soil stabilized would be mixed with the aggregate to provide a solid, relatively smooth surface. The remaining length of the accessible trail (0.70 miles), from the opposite side of Clark Creek to the trail fork, would be repaired. Typical sections for the entrance road, ABA access road, and trail can be found in Appendix D.

After the new parking area, entrance road, and trail extension and repairs are completed, the old parking area and abandoned section of the entrance road would be removed. The Action Alternative would have a total of 6.3 acres of ground disturbance, of which 1.19 acres would be restored to natural conditions. The ground would be scarified to loosen the compacted soil. Topsoil would be added to supplement the existing soils and the area would be seeded with a

native grass and plant mix. River cane (*Arundinaria gigantea*) would also be planted to aid in quickly stabilizing the riparian area with vegetation.

Construction for Alternative B would last approximately four to six months. The staging of equipment and materials would be done within the limits of disturbance for the new entrance road and parking area. No additional areas would need to be disturbed. The Lost Valley Trail would be closed for approximately four weeks in order to complete the repairs.



Figure 7. Proposed Action

Mitigation Measures

Avoidance, minimization, and mitigation measures and best management practices (BMPs) would prevent or minimize potential adverse effects associated with the implementation of the replacement alternatives. These measures and practices would be incorporated into the project design and construction plans.

- No trees would be removed between April 1 and October 15 in order to avoid impacts to Federally-listed bat species.

- Should construction unearth previously undiscovered archeological resources, work would be stopped in the area of any discovery and the park would consult with the State Historic Preservation Officer/Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed as appropriate.

BMPs

- Temporary BMPs would be utilized to minimize erosion and sedimentation from ground disturbing activities that expose bare soil, which would otherwise negatively impact water quality. The BMPs may include the use of silt-fence, sediment logs, erosion matting, or check dams. These BMPs would be used only during construction and would be removed once the disturbed area has been permanently stabilized.
- Reconstructed aggregate surface would be subject to Arkansas Department of Environmental Quality stormwater management requirements.
- To preserve the visual character of the site and the quality of the viewshed, locally available vegetation compatible with the area would be used to revegetate areas on the existing road and parking area, and may be used to screen the view of the parking area.
- Disturbed soil would be re-vegetated using specific native seed mixes that do not include invasive or exotic species.
- Any suitable soil excavated during construction would be stockpiled and reused as fill if needed. Any unsuitable or excess material would be removed from the project and disposed of legally off Government property.
- Topsoil would be obtained from an approved source that is weed-free to minimize the introduction of exotic and/or invasive species.

ALTERNATIVES CONSIDERED BUT DISMISSED

As mentioned previously, alternatives should be “reasonable.” Unreasonable alternatives may be those that are unreasonably expensive; that cannot be implemented for technical or logistic reasons; that do not meet park mandates; that are inconsistent with carefully considered, up-to-date park statements of purpose and significance or management objectives; or that have severe environmental impacts (National Park Service 2015).

Repair of Existing Roadway, Parking Area, and Trailhead

The existing roadway, parking lot and trailhead would be repaired in its current location. This alternative would temporarily address the deteriorated conditions but was deemed to be unsustainable in the event of another localized flood, which occurs often in the project area. It would require constant and costly maintenance as well as potential safety concerns for visitors to the park. Closures of the road and trail due to storm damage would impact the ability for visitors access the Lost Valley area. Sediment and vehicle contaminants would continue to wash into Clark Creek and downstream into the Buffalo River. Therefore, this alternative was dismissed from further consideration.

Table 2.1 Comparison of Alternatives		
	No Action Alternative	Action Alternative
Species of Special Concern	Direct and Indirect Impacts: The No Action Alternative would continue to impact some species of special concern by causing sedimentation of aquatic habitat. Cumulative Impacts: The cumulative impacts on species on special concern would be adverse due to the continued sedimentation of the aquatic habitat. Tree clearing and ground disturbance would be necessary in order to complete the other planned actions in the Lost Valley area. Although BMPs would likely be in place, the potential for additional sedimentation would increase.	Direct and Indirect Impacts: The Action Alternative would have an overall beneficial impact on species of special concern due to the restoration of riparian area and reduction in the sedimentation of aquatic habitat. Cumulative Impacts: The cumulative impacts on species of special concern would be minimally adverse, as other present and future actions would require tree clearing and ground disturbance. While the increased riparian and improved aquatic habitat would be beneficial to species of special concern, the effects would be realized primarily in Clark Creek.
Water Quality	Direct and Indirect Impacts: The No Action Alternative would continue to adversely impact water quality by discharging pollutants into Clark Creek. Cumulative Impacts: The cumulative impacts on water quality would be adverse because of the continued sedimentation and pollution of Clark Creek. The 1,850 feet of Lost Valley Road and parking area adjacent to Clark Creek represents about 0.4% of the gravel roads in riparian area in the watershed. It has a negligible contribution when compared to the total of 83 miles of gravel roads in riparian area within the watershed.	Direct and Indirect Impacts: The Action Alternative would improve water quality by reducing the discharge of pollutants into Clark Creek. Cumulative Impacts: The cumulative impacts on water quality would be adverse. The Action Alternative would remove approximately 0.4% of the amount of roadway in riparian area within the watershed, and the other future actions would include BMPs to minimize erosion and sedimentation. There would be benefits to Clark Creek, and likely to the Buffalo River, but not enough to overcome the other 99.6% of impacts already present in the watershed.
Cultural Landscapes	The No Action Alternative would have no direct or cumulative impacts on cultural landscapes.	Direct and Indirect Impacts: The Action Alternative would have no adverse effect on the cultural landscape because the overall look and feel of the Lost Valley area within the Boxley Valley would not change. Cumulative Impact: The cumulative impacts on cultural landscapes would be negligibly adverse. Other future improvements may also impact the aesthetics and circulation in the cultural landscape depending on the reconfiguration of the area. It is unlikely that the contributing elements to the Boxley Valley Historic District would be compromised.
Visitor Use and Experience	Direct and Indirect Impacts: The No Action Alternative would continue to impact visitor use and experience by limiting access to the Lost Valley area after large storm events which damage the existing access road and parking area. Cumulative Impacts: The cumulative impacts on visitor use and experience would be adverse because while visitors would have improved recreational opportunities and facilities, visitors would have periods of time when access to them would be difficult.	Direct and Indirect Impacts: The Action Alternative would have a beneficial impact on visitor use and experience due to the more sustainable access and parking. Cumulative Impacts: The cumulative impacts on visitor use and experience would be beneficial because the future planned improvements to the Lost Valley area would likely increase visitor enjoyment of the Lost Valley area of the park. The proposed action to provide more sustainable access would contribute to increasing the access and enjoyment of this part of the park.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental conditions in and around the project area and how the existing condition would change as a result of implementing the alternatives presented in Chapter 2: Alternatives. Chapter 3 is organized by impact topic, and includes the impact topics presented in Chapter 1: Purpose and Need that required further analysis. These are: species of special concern, water quality, cultural landscapes, and visitor use and experience.

IMPACT ANALYSIS

For each impact topic, the direct and indirect impact analysis is presented. These are impacts that occur as a result of the alternative. The impact analysis also includes the cumulative impact analysis. Cumulative impacts result 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 impacts are considered for all alternatives, including the no-action alternative. They were determined by looking at each resource (impact topic), determining which past, present, and future actions would also impact the resource, and then combining the impacts of the alternative being considered with impacts from the other past, present, and reasonably foreseeable future actions.

Past Actions

Past Actions include activities that happened in the past and continue to have ongoing impacts. Lost Valley State Park was established in 1967, and was acquired by the NPS as a portion of the Buffalo National River in 1975. Since then, flooding has caused major damage to the roadway, parking area and trailhead on multiple occasions. These floods have necessitated action including rehabilitation of the roadway and the occasional closure of Lost Valley due to potentially dangerous conditions.

In May 2011, the campground at Lost Valley was closed to eliminate the safety issues of flash flooding of the campground on visitors. A portion of the Lost Valley Trail (not including the first 720 feet of the trail), up to the fork that divides the trail into high and low routes to Eden Falls, was upgraded in 2012 to make it barrier-free.

The Lost Valley Trail & Campground EA was completed in 2013 for the installation of a new pedestrian bridge over Clark Creek and the realignment and upgrading of the first 720 feet of the trail from the new bridge. The EA also included the permanent closure of the campground at Lost Valley and upgrading of the amphitheater to make it barrier-free. The pedestrian bridge has not yet been constructed.

Present and Future Actions

The Boxley Valley Comprehensive Area Plan is currently underway to look at the recreational uses and future needs in the Boxley Valley area. Additional development of the Lost Valley is under consideration. This could potentially include new day use areas, a new visitor contact station, and/or moving the existing pavilion.

SPECIES OF SPECIAL CONCERN

Affected Environment

Coordination with the USFWS verified that the following Federally-listed species are known to occur in this region: gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), Ozark big-eared bat (*Corynorhinus townsendii ingens*), and rabbitsfoot (*Quadrula cylindrica cylindrica*). The Buffalo River provides critical habitat for the rabbitsfoot. Also, the Federally-protected bald eagle (*Haliaeetus leucocephalus*) is known to occur in this region.

Gray Bat

The gray bat is the largest species of *Myotis* found in the eastern United States. They have uniform brownish-gray fur that can become chestnut brown or russet following their molt in July or August. Gray bats are distinguishable from other *Myotis* bats by their wings that attach at the ankle rather than at the base of the toes (Missouri Department of Conservation n.d.). Gray bats are also larger than most other *Myotis* species. Gray bats 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 their 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. 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 (U.S. Fish and Wildlife Service 1982). Buffalo National River has several hibernacula, one maternity roost, and eight summer roost sites for this species. The largest hibernaculum for this species in Arkansas is located a short distance away from Lost Valley.

Indiana Bat

The Indiana bat has dark-brown to black fur that looks similar to many other related bat species (U.S. Fish and Wildlife Service 2006). They are temperate, insectivorous, migratory bats that hibernate colonially in caves and mines in the winter (U.S. Fish and Wildlife Service 2007). In the summer they tend to roost and raise their young under the peeling bark of dead and dying trees. Potential roost trees include live trees and snags greater than or equal to five-inch diameter breast height that have exfoliating bark, cracks, crevices and/or hollows. They forage in riparian areas, upland forests and above ponds and fields (U.S. Fish and Wildlife Service 2015). Indiana bats roost in trees throughout the Ozarks, including Buffalo National River, during the summer.

Northern Long-eared Bat

The northern long-eared bat is a medium-size bat. It is distinguishable from other bat species by its distinct long ears which extend past the muzzle when laid forward. The northern long-eared bats' fur is typically colored a light to dark brown on the dorsal side and a light brown on the ventral side. Northern long-eared bats spend winter hibernating in caves. During the summer months, they roost in colonies or singly in cavities, crevices, or underneath the bark of both live and dead trees. In rare cases, they have also been found roosting in structures like barns and sheds. They feed on a variety of insects that include moths, flies, leafhoppers, caddisflies, and beetles. The northern long-eared bat breeding season begins in late summer or early fall and females give birth to a single pup between late May and early July. The young bats start flying after approximately 20 days and can live as long as 19 years (U.S. Fish and Wildlife Service 2015).

Ozark Big-eared Bat

The extremely rare Ozark big-eared bat has distinctive long ears and facial glands on either side of the snout. The fur is light to dark brown depending on the age of the individual and the subspecies. A single pup is typically born in May or June and the young are on their own within two months (U.S. Fish and Wildlife Service 2015).

Rabbitsfoot

The rabbitsfoot is a medium to large mussel, elongate and rectangular, reaching six inches in length. Rabbitsfoot mussels prefer shallow areas with sand and gravel along the bank next to shoals, which provide a refuge in fast-moving rivers. Rabbitsfoot uses about a dozen species of shiners (minnows) for its host species while in the glochidia (larval) life stage (U.S. Fish and Wildlife Service 2015). The Buffalo River is designated as critical habitat for the rabbitsfoot downstream of the Erbie low-water crossing, which is approximately 16.8 stream miles below the project area.

Bald Eagle

The bald eagle is protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Bald eagles are large birds of prey found throughout Arkansas and are known to occur in the project area. They have dark brown bodies and wings, and adults older than 3 years of age have a distinctive white head and tail. They prefer to eat fish, but will eat a variety of foods and are found near aquatic habitats. No bald eagle nests are known to occur in the vicinity of the project area.

State Endangered species are afforded protection under Arkansas Game and Fish Commission (AGFC) Regulations. It is unlawful to import, transport, sell, purchase, hunt, harass or possess any threatened or endangered species of wildlife or parts. The AGFC lists as endangered any wildlife species or subspecies endangered or threatened with extinction, listed or proposed as a candidate for listing by the USFWS, or any native species or subspecies listed as endangered by the Arkansas Natural Heritage Commission. State Endangered plant species are recognized by the Arkansas Natural Heritage Commission as being in danger of being extirpated from the state. This is an administrative designation with no regulatory authority. State Threatened species are native plant taxa which are believed likely to become endangered in Arkansas in the foreseeable future, based on current inventory information.

In Newton County, State Endangered species include the rabbitsfoot, Ozark big-eared bat, gray bat, northern long-eared bat, and Indiana bat. State endangered plant species include the small-head pipewort (*Eriocaulon koernickianum*). State Threatened plants include the: Alabama snow-wreath (*Neviusia alabamensis*), French's shooting-star (*Primula frenchii*), ovate-leaf catchfly (*Silene ovata*), royal catchfly (*Silene regia*), Appalachian filmy fern (*Trichomanes boschianum*), and dwarf bristle fern (*Trichomanes petersii*) (Arkansas Natural Heritage Commission 2015).

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts. Storm runoff would continue to erode the entrance road and parking area, sending sediment into Clark Creek and further downstream to the Buffalo River. Fine sediments can adversely affect mussels by interfering with respiration and feeding, and can even smother juvenile mussels. Increased sedimentation can also indirectly affect mussels by affecting fish species which serve as hosts for freshwater mussel reproduction. The direct impacts of sedimentation on the rabbitsfoot are unknown; however, the species shows a preference for clear, fast flowing streams and gravel substrates (USDA Forest Service, Eastern Region 2002). The No Action Alternative would have no effect on the Federally-listed bat species, the bald eagle, or the state-listed plant species.

Cumulative Impacts. Ongoing agricultural activity in the watershed of the Buffalo River would have adverse impacts to water quality, and in turn would have adverse impacts on aquatic species. Aquatic species impacted would include freshwater mussels and their fish hosts. The washing of aggregate and soil into Clark Creek and downstream to the Buffalo River would continue under the No Action Alternative. Tree clearing and ground disturbance would be also necessary in order to complete the other planned actions in the Lost Valley area. Although BMPs would likely be in place, the potential for additional sedimentation would increase. The presence of gravel and dirt roads in riparian areas is one of several stressors identified in the watershed that is adversely impacting water quality and aquatic habitats; however, the 1,850 feet of Lost Valley Road and parking area adjacent to Clark Creek is a negligible contribution to the total of 83 miles of gravel roads in riparian areas within the watershed. Therefore, the No Action Alternative's incremental addition to the cumulative impacts would not be noticeable.

Conclusions. The No Action Alternative would continue to impact species of special concern by causing sedimentation of aquatic habitat. The cumulative impacts to species of concern would be adverse; however, the No Action Alternative would have a negligible contribution when compared to the other present and future actions that would impact species of special concern.

Action Alternative

Direct and Indirect Impacts. The new entrance road and parking area would be located within an existing hay field, so the majority of the clearing would be to agricultural fields. However, in order to construct the ABA parking area access road and the trail extension, approximately 0.36 acres of trees would be cleared. The ABA parking area access road would follow the utility right-of-way, which is routinely cleared, as much as possible to limit tree clearing. Indiana bats and

northern long-eared bats are also known to roost in suitable trees in the summer months. The trees in the project area are primarily hickory (*Carya*), sweetgum (*Liquidambar styraciflua*), black locust (*Robinia pseudoacacia*), box elder (*Acer negundo*), American elm (*Ulmus americana*), umbrella magnolia (*Magnolia tripetala*), redbud (*Cercis canadensis*), and black gum (*Nyssa sylvatica*), which do not ordinarily provide roosting habitat unless the trees are dead. In order to avoid potential impacts to the Indiana and northern long-eared bats, tree removal would not occur between April 1 and October 15. One northern long-eared bat roost and one Indiana bat roost cave are known to be present within 0.62 mile (one kilometer) of the project; however, neither would be impacted by the Action Alternative.

Gray bats and Ozark big-eared bats typically utilize caves year-round for winter hibernation and summer roosting. Occasionally summer roosts have been found in bridges or other structures. An analysis of known roosts for the four species of bats was completed. A known gray bat cave roost is located within five kilometers of the project; however, the cave would not be impacted by the project. No Ozark big-eared bat cave roosts are known to be present within ten kilometers of the project. The proposed project is not anticipated to impact gray bats or Ozark big-eared bats. Noise levels would increase during construction, for an estimated duration of six months. During this time, construction activities would primarily include excavation, grading, and the placement of aggregate material. These activities would take place during the day and would not disrupt foraging bats.

In order to construct the road, parking area, ABA parking area access road, and trail extension, approximately 1.80 acres of ground would be cleared, which would expose bare, erodible soil for several weeks of time until work is completed and the area is permanently stabilized. In order to reduce the potential for sediment to erode and enter Clark Creek, which could impact the rabbitsfoot, BMPs such as silt fence and temporary seeding would be used. The movement of the road and parking area out of the Clark Creek floodplain and restoration of riparian area would cause a permanent overall decrease in the amount of sediment, improving the habitat available for use by the rabbitsfoot. The reestablishment of a riparian buffer area would also provide additional foraging area for bats and bald eagles.

Cumulative Impacts. Ongoing agricultural activity in the watershed of the Buffalo River, and more specifically Boxley Valley, would continue to have adverse impacts to water quality. These impacts to water quality would also continue to have adverse impacts on aquatic species, such as freshwater mussels and their fish hosts. The washing of aggregate and soil into Clark Creek and downstream to the Buffalo River would continue under the Action Alternative. The presence of gravel and dirt roads in riparian areas is one of several stressors identified in the watershed that is adversely impacting water quality and aquatic habitats. The potential plans to make improvements to the Lost Valley area would have localized short-term impacts to freshwater mussels due to the increased ground disturbance; however, BMPs would be implemented to control erosion and reduce sedimentation. The 1,850 feet of Lost Valley Road and parking area adjacent to Clark Creek has a negligible contribution in comparison to the total of 83 miles of gravel roads in riparian areas within the watershed. Northern long-eared, gray, and Indiana bats have been found with white nose syndrome symptoms or have died from the disease. This disease has decimated bat population numbers, leading to the listing of the northern long-eared bat as threatened. Other present and future actions in the study area would not adversely impact bats. The improvements to the local riparian area from the Action Alternative are not

anticipated to have a noticeable improvement on bat or eagle population numbers. The small portion of cumulative impacts attributed to the Action Alternative would be overshadowed by the impacts from the other actions.

Conclusions. The Action Alternative would have an overall beneficial impact on species of special concern due to the restoration of riparian area and reduction in the sedimentation of Clark Creek. Although the expansion of riparian habitat would have a localized positive contribution, the cumulative impacts on species of special concern would be adverse, as other actions would continue to impact species of concern.

WATER QUALITY

Affected Environment

The Buffalo River is one of the few rivers in the continental United States that is undammed, and was declared the first national river by the U.S. Congress in 1972 (Public Law 92-237, March 1, 1972) for the purposes of "...conserving and interpreting an area containing unique scenic and scientific features, and preserving as a free-flowing stream an important segment of the Buffalo River in Arkansas for the benefit and enjoyment of present and future generations..." Most of the land in the river basin is agricultural, with cleared acreage being confined to sparse bottomland and upland ridges. These open fields are used primarily for cattle and hay production. Boxley Valley is an area of special designation that includes roughly 8,000 acres in the upper portion of Buffalo National River. The valley is approximately seven miles long. It has been designated as a historic district with archeological and cultural resources but remains in private use, thereby retaining a rural agricultural setting.

The Buffalo River's water quality is monitored by the NPS in partnership with Arkansas Department of Environmental Quality. Water quality parameters that are monitored include temperature, pH, dissolved oxygen, turbidity, fecal coliform, specific conductivity, and E. coli. Clark Creek is a tributary of the Buffalo River, and so pollutants discharged to Clark Creek flow downstream to the Buffalo River.

Sedimentation of Clark Creek increases the amount of suspended solids in the water, which is typically measured by turbidity. Increased turbidity blocks out the light needed by submerged aquatic vegetation and species. It can also raise surface water temperatures above normal because suspended particles near the surface facilitate the absorption of heat from sunlight. Turbid waters may also be low in dissolved oxygen. Stormwater runoff also carries vehicle pollutants, such as fuel, oil, grease, antifreeze, and brake dust and tire wear and currently discharges them into Clark Creek.

A Water Resources Management Plan was completed in 2004 to summarize the water resources and related issues and make recommendations for future actions. The plan states that within the 1,338 square mile Buffalo River watershed, there are about 2,000 miles of roads. Eighty-three of these miles are active dirt and gravel roads located inside the park boundaries which contribute large volumes of sediment to the river during storm runoff. The Water Resources Management Plan recommends implementation of BMPs in the watershed, such as the establishment of

riparian buffers and riparian bank restoration, as the water quality of the Buffalo River is declining (Buffalo National River 2004).

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts. Lost Valley Road, which consists of compacted dirt and gravel, does not have a crown and associated drainage structures other than a ditch line in some places. This lack of drainage structures does not allow the road to properly disperse flows which allows large volumes of storm runoff to collect in ditches before it is released. Sediment would continue to wash into Clark Creek during storm events, causing sediment in the water to travel downstream to Buffalo River. The turbidity of both Clark Creek and the Buffalo River would continue to increase as the sediment load in these systems increases. Sediment deposition over time also affects the ability of the Buffalo River to remain as a free-flowing system. The increase in gravel loading of the stream bed has many adverse impacts to the system, including: increased intensity and frequency of lateral migration of the stream channel resulting in loss of farmland and archeological and historic resources; additional sediment reaching the River; shallower and wider cross sections of the channel; greater insolation of the River; and, reduced habitat for aquatic fauna because of higher water temperatures in summer and lower water temperatures in water and the resulting increased algae production.

Cumulative Impacts. The No Action Alternative impacts water quality, specifically turbidity. The Water Resources Management Plan identified 83 miles of active dirt and gravel roads inside the park boundaries which contribute large volumes of sediment to the river during storm runoff. The 1,850 feet of Lost Valley Road and parking area adjacent to Clark Creek represents about 0.4% of the gravel roads in riparian area in the watershed. Other future actions that could increase the turbidity of Clark Creek and the Buffalo River include the potential improvements in the Lost Valley area which would create additional ground disturbance. The facilities would meet current design standards, including those for erosion and sediment control, so the runoff of sediment from those activities is anticipated to be negligible. The No Action Alternative when combined with the other present and future actions would have adverse impacts on water quality because of the continued pollution of Clark Creek. The cumulative impacts associated with the No Action Alternative would have a small, but measurable contribution to the overall adverse cumulative impacts on water quality.

Conclusions. The No Action Alternative would continue to adversely impact water quality by discharging pollutants into Clark Creek. Through the Water Resources Management Plan and continued water quality monitoring in the Buffalo River watershed, the sources of pollution have been identified and a plan has been outlined for the improvement of water quality. Cumulative impacts to water quality would be adverse because Clark Creek would continue to be degraded due to the lack of permanent stormwater management.

Action Alternative

Direct and Indirect Impacts. The entrance road and parking area would be moved further away from Clark Creek. Although the relocation of the parking area and entrance road increases the amount of impervious area in the Lost Valley area from 1.27 acres to 1.77 acres of impervious area, storm runoff would infiltrate the surrounding vegetated area as sheet flow and would no longer discharge directly to Clark Creek. The reduction in the amount of sediment entering Clark Creek would reduce turbidity. There would also be a reduction in the amount of vehicle pollutants discharged to Clark Creek. During construction, BMPs would be used for erosion and sediment control to minimize impacts to water quality.

Cumulative Impacts. The Action Alternative has a beneficial impact on water quality, specifically by reducing turbidity. The Water Resources Management Plan identified 83 miles of active dirt and gravel roads inside the park boundaries which contribute large volumes of sediment to the river during storm runoff. Other future actions that could impact the turbidity of Clark Creek and the Buffalo River include the potential improvements in the Lost Valley area, which would create additional ground disturbance. The facilities would meet current design standards, including those for erosion and sediment control, so the runoff of sediment is anticipated to be negligible. The Action Alternative would contribute a noticeable improvement to the cumulative impacts on the water quality of Clark Creek by reestablishing a buffer area and allowing runoff to infiltrate prior to reaching Clark Creek. While the amount of cumulative impacts associated with the Action Alternative on the water quality of Clark Creek would be substantial, the impacts would be diminished for the Buffalo River due to its large watershed.

Conclusions. The Action Alternative would improve water quality by reducing the discharge of pollutants, such as sediment and those related to motor vehicle use. The cumulative impacts on water quality would be beneficial. The reconfiguration of the road, parking, trail and facilities in the Lost Valley area would be designed to meet current standards and treat storm runoff, which would reduce the discharge of pollutants and improve water quality.

CULTURAL LANDSCAPES

Affected Environment

The Boxley Valley area is located in the western portion of the park along the upper Buffalo River. The valley extends southward from the community of Ponca and is characterized by a gently rolling terrain of agricultural fields interspersed with homesteads and surrounded by steep forested hills. State Highways 43 and 21 extend through the valley and are paved, two-lane roads that largely follow the path of the Buffalo River. Boxley Valley historically has contained some of the region's richest farmland and has supported the most prosperous farms along the Buffalo River. Early settlers arrived in the 1830s with the community of Boxley taking shape primarily in the late nineteenth century. The Boxley Valley Historic District, also known as the Big Buffalo Valley Historic District, was listed on the NRHP on July 29, 1987 for its significance in the history of the Buffalo River area and as a significant cultural landscape of the Arkansas Ozarks.

Lost Valley State Park was established in 1967, and in 1975 it was acquired by the NPS as part of the Buffalo National River. The NPS developed picnic and camping facilities in the Lost Valley area after acquiring the Lost Valley area, but records do not indicate what features (such as roads or trails) may have been present when NPS development took place. Although the Lost Valley is located within the Boxley Valley Historic District, no determination of eligibility for the Lost Valley as a cultural landscape has been made. As visitors enter the Lost Valley area, they pass through agricultural fields (currently used for growing hay) bordered by forested hillsides, and along Clark Creek as they enter the forest to reach the parking area for the Lost Valley Trailhead, pavilion, and other related facilities.

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts. The No Action Alternative would have no impact on the cultural landscape.

Cumulative Impacts. There are no direct impacts, and so there can be no cumulative impacts.

Conclusions. The No Action Alternative would have no direct or cumulative impacts on cultural landscapes.

Action Alternative

Direct and Indirect Impacts. Relocation of the entrance road and area, as well as the construction of a trail extension and a service road, would change the circulation patterns in Lost Valley. Instead of bisecting the cultivated fields and then following Clark Creek to the parking area and trailhead, the new road would follow the existing tree-line along the northern boundary of the field. The new parking area would be located in an area that is currently and has historically been used for agriculture, impacting the land use and appearance of the area. However, the removal of the portion of Lost Valley Road that bisects the fields would allow for this to return to agricultural use, giving the appearance of one large field south of the road, since the existing road would be seeded with a native grass and forb seed mix. The removal and restoration of the portion of Lost Valley Road and parking area that runs along Clark Creek would allow for the re-establishment of a riparian area along Clark Creek.

The new entrance road and parking area would have a gravel surface, and so they would appear similar to the existing road and parking area. The new parking area would be of a similar capacity and size. The entrance road would be a total length of 1,550 feet (including the portion of the access road for the accessible parking spaces), and approximately 1,860 linear feet of the existing road would be removed and restored. There would be an overall reduction in the amount of road surface of 300 linear feet. The new parking area and road would be located north of the Keeton House/Clark House, and so it would not be affected by the project.

The existing parking area is screened by mature trees, as it is located behind a forested area as visitors approach the parking area. The new location of the parking area would be more visible

within the landscape. Trees may be planted to screen the new parking area. The Lost Valley area would continue to appear as a gently rolling terrain of agricultural fields surrounded by steep forested hills. The Action Alternative would have no adverse impact on the cultural landscape.

Cumulative Impacts. Other future actions within the Boxley Valley include the potential improvements for the Lost Valley area, which could include providing new day use areas, a new visitor contact station, and/or moving the existing pavilion. These improvements may also impact the aesthetics and circulation of the cultural landscape depending on the reconfiguration of the area. Cumulative impacts to the cultural landscape would be negligible though, as it is unlikely that the contributing elements to the Boxley Valley Historic District would be compromised. There are no plans to change the land uses in the area. The cultural landscape would continue to appear as a gently rolling terrain of agricultural fields surrounded by steep forested hills. The portion of the cumulative impacts associated with the Action Alternative would be noticeable, but would not be greater than those associated with the other actions.

Conclusions. The Action Alternative would have no adverse impacts on the cultural landscape because the overall look and feel of the Lost Valley area within the Boxley Valley would not change. The cumulative impact on the cultural landscape would be neither adverse nor beneficial, as the landscape would continue to include hay fields surrounded by forested hills.

Section 106 of the National Historic Preservation Act Summary. Coordination was completed with the State Historic Preservation Office (also referred to as the Arkansas Historic Preservation Program) regarding the potential for the proposed project to adversely affect cultural resources. FHWA and the NPS determined that the proposed project would not adversely affect any known or potential cultural resources. In a letter dated November 4, 2016, the State Historic Preservation Office concurred that the project would have no adverse effect on the Big Buffalo Valley Historic District (Boxley Valley Historic District).

VISITOR USE AND EXPERIENCE

Affected Environment

The Lost Valley area is one of the most popular destinations for visitors of the Buffalo National River, receiving approximately 77,000 visitors per year. Lost Valley is a day-use only area where visitors can enjoy a range of activities. The area features a pavilion, drinking water, restrooms, and access to the Lost Valley Trailhead. The Lost Valley Trail is approximately 1.2 miles long. The trail begins at the existing parking area and ends at Eden Falls Cave, a popular destination for hikers. The trail follows the course of Clark Creek, and travels through a mature hardwood forest. The Lost Valley Trailhead is the only access to the Lost Valley Trail; there are no connections from other trailheads. A portion of the trail, from Clark Creek to the fork that divides the trail into high and low routes to Eden Falls, was upgraded in 2012 and 2013 to make it barrier-free. However, the trail was damaged by the storms in 2015. There was previously a trail bridge across Clark Creek; however, it washed out in April 2011 and still needs to be replaced (National Park Service 2013).

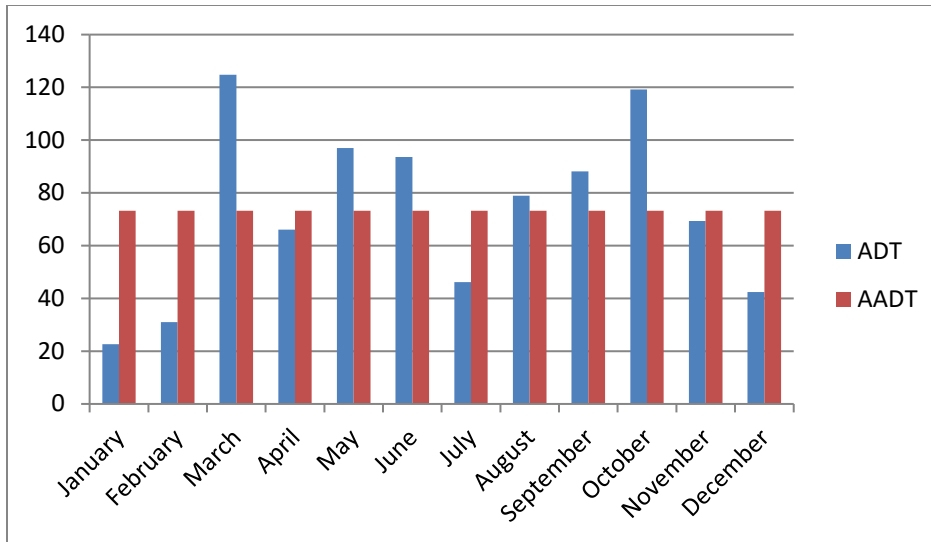


Figure 8. Lost Valley Traffic Data (NPStats, 2017)

The AADT for Lost Valley (Figure 8) from 2011 through 2016 indicates a peak number of vehicles in March (125) and a low number of vehicles in January (23). High visitation is typically during the months of March, May, June, August, September and October. Average recreational visitation for the park as a whole from 2011 through 2016 indicates peak visitation during the month of June, with approximately 245,000 visitors, and 1,332,305 visitors per year (National Park Service Visitor Use Statistics 2017).

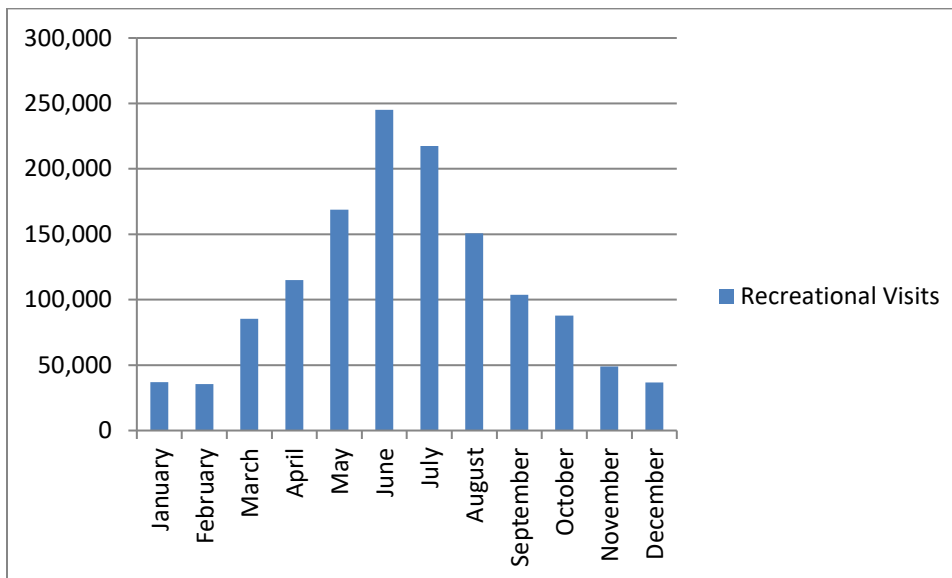


Figure 9. Buffalo National River Recreational Visits (NPStats, 2017)

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts. The entrance road and parking area would continue to be damaged during storm events, and would likely require temporary closures so repairs can be made. The degraded road and parking area and recurring closures to make repairs limits the ability for visitors to access the Lost Valley area.

Cumulative Impacts. Past projects in the Lost Valley area, such as upgrading a section of the Lost Valley Trail and the amphitheater to be barrier-free have resulting in a more accessible and enjoyable experience for visitors. Future construction of the trail bridge across Clark Creek and the other potential improvements for the Lost Valley would also likely increase visitor enjoyment of the Lost Valley area of the park. However, depending on the location of these improvements, visitor access may continue to be limited after large storm events. The No Action Alternative would contribute noticeably to the overall impacts to visitor use and experience at Lost Valley if visitors are unable to access recreational opportunities and facilities. However, the Buffalo National River provides similar recreations uses and visitor experience throughout the park.

Conclusions. The No Action Alternative would continue to impact visitor use and experience by limiting access to the Lost Valley area after large storm events damage to the existing access road and parking area. The proposed action would contribute noticeably to the cumulative impacts to visitor use and experience; however, similar uses and experience are available elsewhere in the park.

Action Alternative

Direct and Indirect Impacts. The existing entrance road and parking area would remain open during construction, so visitors would continue to be able to access the Lost Valley area. The new parking area would be located east of the current trailhead outside of the Clark Creek floodplain in order to reduce the potential for damage from future storm events. Movement of the trailhead to the new parking area would require an approximately 900-foot extension of the trail to connect to the existing trailhead. Visitors would need to use the trail extension to access the pavilion, picnic table, and toilets. Accessible parking spaces would be provided near the existing parking area, but outside of the floodplain for Clark Creek. The trail extension would provide barrier free access to the proposed crossing of Clark Creek. A trail bridge across Clark Creek would be constructed through another effort in the future, which would reconnect the trail extension to the rest of the accessible Lost Valley Trail.

Cumulative Impacts. Past projects in the Lost Valley area, such as upgrading a section of the Lost Valley Trail and the amphitheater to be barrier-free have resulting in a more accessible and enjoyable experience for visitors. Future construction of the trail bridge across Clark Creek and the other potential improvements for the Lost Valley would also likely increase visitor enjoyment of the Lost Valley area. The Action Alternative would provide more sustainable access to the amenities in the Lost Valley area. When combined with the other past, present, and future actions that also increase the access and enjoyment of this part of the park, visitor

experience would be noticeably improved. Visitation to the Lost Valley area may also increase as a result.

Conclusions. The Action Alternative would have a beneficial impact on visitor use and experience due to the more sustainable access and parking. The cumulative impact on visitor use and experience would be beneficial. Visitors would be able to enjoy additional recreational opportunities and facilities, and would have improved and consistent access. The Action Alternative would noticeably contribute to the cumulative impacts to visitor use and experience.

CHAPTER 4: PUBLIC INVOLVEMENT AND COORDINATION

This chapter documents the scoping process for this project and includes the official list of recipients for the document. As required by NPS policies and planning documents, it is the park's objective to work with Federal, State, and local governmental and private organizations to ensure that the park and its programs are coordinated with theirs, and are supportive of their objectives, as far as proper management of the park permits, and that their programs are similarly supportive of park programs.

PUBLIC INVOLVEMENT

Comments from the public are solicited at two stages in the project planning process, public scoping and the public comment period. Information about the proposed project was made available to the public on the NPS's Planning, Environment, and Public Comment website during the public scoping comment period, from August 8 through September 9, 2016. A scoping letter providing details of the proposed project and contact information for comments was sent to a mailing list comprised of Federal, State, and local agencies, elected officials, organizations, and advocacy groups. A legal notice was run in the Newton County Times and the Arkansas Democrat Gazette on August 8, 2016 announcing the public scoping comment period.

This EA will be available for public review from December 4, 2017 through January 17, 2018. During this 45-day period, copies of the EA will be available for review at the Buffalo National River Visitor Center, and the Boone County Library located at 221 W. Stephenson Avenue, Harrison, AR 72601. An electronic version of this document can be found on the NPS's PEPC website at <http://parkplanning.nps.gov/buff>. This site provides access to current plans, environmental impact analyses, and related documents on public review. An electronic version may also be found at the FHWA, Office of Federal Lands Highway's website at <https://flh.fhwa.dot.gov/projects/ar/lost-valley/>.

Comments on this EA will be summarized and responded to in an Errata sheet to be appended to the decision document.

AGENCY COORDINATION AND PERMITS

Agency Coordination

Other Federal, State and local governments were contacted during the planning process. Appendix B contains copies of written correspondence with those agencies.

Endangered Species Act of 1973 Coordination and Consultation

In a letter dated August 10, 2016, the USFWS replied during scoping for the project and provided a review of the project. On February 8, 2017, the FHWA sent a letter to the USFWS requesting concurrence that the project may affect, but is not likely to adversely affect rabbitsfoot, Ozark big-eared bat, gray bat, and Indiana bat. The FHWA also determined that the project would not result in any prohibited incidental take of the northern long-eared bat. In a letter dated February 27, 2017, the USFWS concurred with these determinations.

National Historic Preservation Act of 1966 Coordination and Consultations

On October 4, 2016, the draft report for the Phase I Archeological Investigation was provided to the State Historic Preservation Officer. FHWA and the NPS determined that the proposed project would not adversely affect any known or potential cultural resources. In a letter dated November 4, 2016, the Arkansas Historic Preservation Program concurred that archeological site 3NW500 was not eligible for the NRHP. They also concurred that the Keeton House/Clark House is outside of the project area and would not be affected by the project; and, that the project would have no adverse effect on the Big Buffalo Valley Historic District.

On January 30, 2017, letters requesting concurrence that the project would have no adverse effect on cultural resources were sent to the: Osage Nation, Cherokee Nation of Oklahoma, Tunica-Biloxi Tribe of Louisiana, Inc., Caddo Nation of Oklahoma, Absentee Shawnee Tribe of Oklahoma, Shawnee Tribe of Oklahoma, United Keetoowah Band of the Cherokee Indian Nation, and Wichita and Affiliated Tribes. On February 21, 2017, concurrence was received from the Shawnee Tribe. Concurrence was also received on that date from the United Keetoowah Band of the Cherokee Indian Nation, along with conditions that would be incorporated into the project.

Permits

If the action alternatives were implemented, several permits would be required in order to construct the project. These permits include:

Clean Water Act Section 404 Permit/ Section 10 of the Rivers and Harbors Act

The Rivers and Harbors Appropriation Act of 1899 prohibits the creation of any obstruction to the navigable capacity of any of the waters of the United States. The Federal Water Pollution Control Act, more commonly known as the "Clean Water Act," under Section 404, directs the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into waters of the United States at specified disposal sites. No wetlands are present in the project area; however, this project would discharge dredged or fill material into the waters of the United States. The proposed project would most likely qualify for coverage under Nationwide Permit 14, Linear Transportation Projects. There is no associated fee, and the review period is typically 45 calendar days for Nationwide Permits.

401 Water Quality Certification

The 401 Water Quality Certification is a "certification," needed for any Federal permit involving impacts to water quality. Most 401 Certifications are triggered by Section 404 Permits issued by the U.S. Army Corps of Engineers. Typical types of projects involve filling in surface waters or wetlands. Section 401 of the Clean Water Act delegates authority to the States to issue a 401 Water Quality Certification for all projects that require a Federal permit (such as a Section 404 Permit). In Arkansas, this certification is issued by the Arkansas Department of Environmental Quality (ADEQ). The "401" is essentially verification by the State that a given project will not remove or degrade existing, designated uses of "Waters of the State," or otherwise violate water quality standards. A 401 Certification is issued along with the 404 Permit unless the project is on Extraordinary Resource Waters or does not meet the qualifications for a general nationwide permit.

Short Term Activity Authorization

Activities that cause a disturbance to the water or the stream bed that might cause a violation of the Arkansas Water Quality Standards must be authorized by the ADEQ through a Short Term Activity Authorization.

National Pollutant Discharge Elimination System Permit

The Clean Water Act prohibits anybody from discharging “pollutants” through a “point source” into a “water of the United States” unless they have a National Pollutant Discharge Elimination System (NPDES) permit. Wastewater, construction permit, stormwater, and pretreatment are managed through ADEQ’s NPDES permitting program. The Construction General Permit authorizes stormwater discharges from large and small construction activities that result in a total land disturbance equal to or greater than one acre (Arkansas Department of Environmental Quality).

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CHAPTER 5: REFERENCES

- Arkansas Natural Heritage Commission. *Rare Species Search*. September 2015.
<http://www.naturalheritage.com/Research-and-Data/rare-species-search> (accessed January 31, 2017).
- Buffalo National River. *Water Resources Management Report*. Harrison: U.S. Department of the Interior, National Park Service, 2004.
- Clinton, William. "Executive Order 12898." *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*. Washington D.C.: The White House, February 11, 1994.
- Missouri Department of Conservation. *Gray Myotis (Gray Bat)*. n.d.
<http://nature.mdc.mo.gov/discover-nature/field-guide/gray-myotis-gray-bat> (accessed September 23, 2016).
- National Park Service. *Director's Order #12: Conservation Planning, Environmental Analysis, and Decision-making*. 2001. www.nps.gov/policy/DOrders/Dorders12.html.
- National Park Service. *Lost Valley Trail & Campground Environmental Assessment*. Environmental Assessment, National Park Service, 2013.
- National Park Service. *Lost Valley Trail & Campground Environmental Assessment*. Harrison: National Park Service, 2013.
- . *Management Policies*. 2006. www.nps.gov/policy/MP2006.pdf.
- National Park Service. *National Park Service NEPA Handbook*. Handbook, Washington D.C.: National Park Service, 2015.
- . *NPS Stats*. n.d. (accessed March 2017).
- . *Procedural Manual #77-1: Wetland Protection*. 2008.
www.nature.nps.gov/water/wetlands/DO%2077-1%20PROC%20FEB%202008%20-%20FINAL.pdf.
- . *Procedural Manual #77-2: Floodplains Management*. 2003.
www.nature.nps.gov/rm77/floodplain.html.
- National Park Service Visitor Use Statistics. 2017. <https://irma.nps.gov/Stats/Reports/Park/BUFF> (accessed April 5, 2017).
- National Park Service. *Lost Valley Reopens*. June 16, 2011.
<https://www.nps.gov/buff/learn/news/lost-valley-reopens.htm> (accessed June 13, 2016).
- National Weather Service. *Heavy Rain/Severe Storms on May 7-11, 2015*. August 3, 2015.
<http://www.srh.noaa.gov/lzk/?n=rain0515.htm> (accessed June 16, 2016).
- President of the United States. *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. n.d. www.fs.fed.us/land/envjust.html.
- Thomason and Associates. *Theme Identification, Context Studies, and Property Evaluations*. Nashville: National Park Service, 2004.
- U.S. Fish & Wildlife Service. *Species Profile for rabbitsfoot (Quadrula cylindrica ssp. cylindrica)*. n.d. <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=F03X> (accessed September 16, 2015).
- U.S. Fish and Wildlife Service. *Arkansas Field Office - Northern Long-eared Bat*. December 30, 2015. <https://www.fws.gov/arkansas-es/Species/mammals/NLEB.html> (accessed September 23, 2016).
- U.S. Fish and Wildlife Service. *Arkansas Field Office - Indiana Bat*. December 30, 2015.
<https://www.fws.gov/arkansas-es/Species/mammals/IndianaBat.html> (accessed

- September 23, 2016).
- . "Gray Bat Recovery Plan." July 8, 1982. https://ecos.fws.gov/docs/recovery_plan/820701.pdf (accessed September 23, 2016).
 - . "Indiana Bat Draft Recovery Plan: First Revision." April 2007.
http://ecos.fws.gov/docs/recovery_plan/070416.pdf (accessed September 23, 2016).
 - . "Indiana Bat Fact Sheet." December 2006.
<https://www.fws.gov/midwest/endangered/mammals/inba/pdf/inbafactsht.pdf> (accessed September 23, 2016).
 - . "Neosho Mucket and Rabbitsfoot Mussels." April 2015.
 - . *Species Profile for Ozark Big-Eared bat (Corynorhinus (=plecotus) townsendii ingens)*. December 30, 2015. <http://ecos.fws.gov/ecp0/profile/speciesProfile?scode=A075> (accessed September 16, 2016).
- US Census Bureau. *Newton County, Arkansas*. 2015.
<http://www.census.gov/quickfacts/table/PST045215/05101> (accessed June 13, 2016).
- USDA Forest Service, Eastern Region. *Conservation Assessment for the Rabbitsfoot (Quadrula cylindrica) Say, 1817*. Milwaukee: USDA Forest Service, 2002.