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

Facilities Improvements
Environmental Assessment

September 2010

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Summary

Buffalo National River (BNR) proposes to improve vehicle and pedestrian access to the river at Rush and Hasty Landings, provide parking space at the Spring Creek Trailhead, and improvements to the Lost Valley Trail for hiker safety and to ensure compliance with standards set by the Americans with Disabilities Act (ADA).

Specifically, at Rush Landing, trees and brush would be cleared along the side of the ramp exit road and a pedestrian trail would be constructed up the hill so that foot and vehicular traffic would not have to use the same roadway. Drainage culverts would be installed at the top and bottom of the ramp exit road. The road along the river that leads to Clabber Creek and the Bowman Tract past Rush Landing would be widened where needed to allow for proper traffic flow and a turnaround would be constructed approximately 75 to 100 yards down the road using the existing power line right of way. This would allow vehicles waiting to use the landing to line up in a location that does not block traffic coming into and leaving the landing area. The power line to the Bowman Tract would be removed and additional parking spaces for concessionaire buses would be created in the abandoned right-of-way. The original footprint of the existing parking lot would be restored and stockpiled gravel relocated offsite in a BNR storage area..

The Ozark Highland Trail extension / Buffalo River Trail intercepts Spring Creek Road [Searcy County Road (Searcy CR 99)] just inside the BNR boundary. Hikers use this location as an access point for the trail. NPS proposes to construct a parking area that would accommodate up to four vehicles adjacent to the road just inside the boundary, to alleviate hikers parking along Searcy County Road 99/Spring Creek Road.

At Hasty Landing a canoe walkway would be constructed to alleviate social trailing, which would in turn reduce bank destabilization at the launch site. Area of social trailing would be restored and devices would be installed to direct foot traffic down canoe walkway. Two large trees in the parking area would be removed to improve vehicle maneuvering and increase parking space. The parking area would be slightly expanded and re-graded to improve control of stormwater runoff. A modern bathroom facility with better ventilation would be installed slightly uphill from the existing facility, out of the floodplain, and a pedestrian trail would be constructed in the woods beside the entrance road to facilitate easy access without impeding vehicular traffic coming into and out of the landing area. Hasty Landing would remain a non-Americans with Disabilities Act (ADA) compliant facility.

At Lost Valley, the NPS proposes to update the 1st 0.25 mile of the trail and the amphitheater to meet modern ADA standards as well as extend the ADA portion of the existing trail up to another 0.4 mile where existing social trails have been created to view Clark Creek at a prominent stone fissure. These improvements may also include the use of other social trails leading to Clark Creek, including on the passes an old, hollow-out beech tree. Aside from improvements to meet ADA standards, additional benches would be added for visitor rest and reflection. The existing ADA portion of the trail has inadequate drainage crossings and numerous safety hazards. Safety hazards include rock slides, sloping and uneven footing, exposed tree roots, loose, broken and missing native stone steps, and deteriorated rock retaining walls. The NPS also proposes to complete upgrades to the remaining trail which leads

up to the Natural Bridge, past Eden Falls to Eden Falls Cave and the loop back to the main trail. This portion of the trail system would be improved and stabilized. Stone steps would be secured and trip hazards such as rocks and roots would be removed and water bars would be installed. Drainage crossings would be improved by the use of buried pipes or stone culverts. A handhold would be installed at the cave entrance to reduce the number of accidents that occur each year when visitors slip and fall down the steep slope below the cave entrance.

This environmental assessment evaluates two alternatives: a no-action alternative and an action alternative. The no-action alternative describes the current condition if no facility improvements are constructed. The action alternative comprises the improvements described above.

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

Public Comment

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

This environmental assessment will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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PURPOSE AND NEED

Introduction

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

The purpose of this environmental assessment is to examine the environmental effects associated with the proposal to construct improvements to facilities at BNR. The improvements would be constructed at Rush and Hasty Landings, Spring Creek Road at the Buffalo River Trail crossing, and the Lost Valley Trail. The scope of this EA is limited to the improvements described in the proposed action. The following regulations and guidance documents guide the planning and completion of the projects proposed in the EA:

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

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

NPS Organic Act of 1916 – Congress directed the U.S. Department of the Interior and NPS to manage units "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such 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 the 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 § 1 a- 1). An impairment determination has been prepared for the preferable alternative in this EA and has been included in Appendix C of this EA.

- **Clean Water Act/Regulations** – provides national recommended ambient water quality criteria and calls for no degradation of the nation's surface waters.
- **Arkansas Water Quality Regulations** – conserve waters of the State to protect, maintain and improve water quality.
- **Safe Drinking Water Act** - The SDWA authorizes the Environmental Protection Agency (EPA) to set maximum contaminant levels (MCLs) for dangerous chemicals, waterborne bacteria and viruses in the public's drinking water.
- **Executive Order 11990** – provides for the protection of wetlands.
- **Executive Order 11988** – provides for the protection of floodplains.
- **Clean Water Act and Section 404 Regulations** – provides for the protection of wetlands and waters of the United States.
- **Endangered Species Act/Section 7** – provides for the listing and protection of endangered and threatened species and their critical habitat; requires consultation under Section 7 if any listed species may be adversely affected.
- **National Historic Preservation Act (NHPA)/Section 106** – provides for the identification and protection of historic sites and structures.
- **Archeological Resource Protection Act** – provides for the protection of archeological resources on public lands.
- **Executive Order 13007** – provides for protection of Indian sacred sites.
- **NPS Director's Order #28, Cultural Resource Management Guidelines (1998b)** – defines how the NPS will protect and manage cultural resources on NPS lands in accordance with the NPS Management Policies.
- **Federal Cave Resource Protection Act (1988)** – requires federal land managers to consider impacts of management activities on resources present in significant caves. NPS determined that all caves in National Park units are significant under the law.

Background

Rush Landing is a former late 19th and early 20th century mining site that is currently the downstream-most maintained landing within the boundary of BNR. It is located at the end of Marion County Road 6035 (Marion CR 6035) approximately 10 miles southeast of Yellville, AR. As the last take-out point on the river within BNR, it receives heavy visitor use by canoeists during the spring, summer, and fall seasons. Additionally, it serves as a ramp for john boats heading downstream to fish and camp.

Vehicular traffic flow within the landing area is frequently congested on weekends and compounded by pedestrian traffic walking in the roadways. The existing restroom facility consists of a single vault toilet designed for general use. Parking space at Rush Landing is currently very limited, making it difficult for users to find a place to leave their vehicles while using the river. Erosion of the embankment on the downstream side of the ramp from stormwater runoff is threatening to undermine the ramp exit road.

The Buffalo River Trail crosses Spring Creek Road (Searcy CR 99) just inside the BNR boundary. The intersection of the Buffalo River Trail and Searcy CR 99 make it a convenient access point for hikers. Presently, no trailhead exists at this access point, thus hikers have no place to park their vehicles. Consequently, they are parallel parking along the edge of the road next to the trail crossing. Searcy CR 99 is a two-lane gravel road with no shoulder; therefore, when cars are parked along the side of the road, through traffic traveling both directions must take turns passing parked vehicles. Although this road does not experience a lot of traffic, there is also no place for hikers to stage their equipment before or after a hike and there is no place to

put up a bulletin board for BNR to post information, and parked vehicles are causing resource damage by creating social parking spots.

Hasty Landing is located at the crossing of State Road 123 (AR 123) on the south side, near the upstream end of the middle third, of the river. This landing was developed before BNR came under federal management. Previous improvements to the facility included guard rails, a single-toilet vault restroom, a graveled surface, designated parking spaces, two gravel-bar access ramps, and signage. The entire landing is located well within the 100-year floodplain, including the vault restroom which is presently located at the edge of the parking area. Pedestrian traffic using the access road to reach the restroom conflicts with vehicle traffic entering and leaving the parking area. The parking area is not adequately graded to facilitate proper drainage after heavy rains and flooding. Two mature trees located within the parking area make it difficult for users to park and maneuver their vehicles. The rounded corners of the parking area results in wasted space when the landing is busy. The main gravel-bar access ramp located between the gravel-bar and the center of the parking lot has a steep slope that makes it difficult to protect from erosion. The steep slope also makes it less desirable to some users than the more moderately sloped ramp located at the downstream, south end of the parking area. The southern ramp has been subjected to the development of a social trail that shortcuts the distance to the gravel-bar where canoes are launched and retrieved.

The Lost Valley Trail is located near the western, upstream end of BNR. It is the most heavily used trail at BNR with approximately 50,000 visitors/year based on traffic counter data. Peak visitation occurs during the Spring and Fall Seasons. All age groups, from toddlers to the elderly, are seen walking on this trail on a frequent basis. Some are experienced hikers in good shape and wearing sturdy footwear while others struggle with the steep, rugged sections of the trail and/or are seen wearing loose sandals. It is not uncommon to see infants in strollers or in specially designed carriers or backpacks along the trail.

This frontcountry trail starts at the popular Lost Valley Campground in the scenic Boxley Valley Historic District. It is approximately one mile long and follows the course of Clark Creek to Eden Falls, terminating at Eden Falls Cave. The trail winds its way through a mature hardwood forest with a notable population of beech trees scattered throughout. There is a small, rustic “amphitheater” located near the beginning of the trail. There are a number of social trails that lead from the trail over to Clark Creek between the trailhead and Eden Falls. The trail to the natural bridge is very moderately sloped. The short segment from Eden Falls to Eden Falls Cave is steep, narrow, slippery when wet, poorly defined and exposed to 30 foot drops or more in some places.

The entire length of the trail is sprinkled with safety hazards such as exposed tree roots and rocks, which present a common trip hazard. Stone steps in some locations are loose and uneven, and become very slippery when wet. There are several drainages along the trail that experience localized flooding in which visitors may attempt to ford. The trail has received numerous accidents involving broken legs, sprained ankles and other traumatic injuries. Neither the amphitheater nor the trail is constructed to the current standards set by the ADA. While the initial portion of the trail was originally developed to be an ADA trail, changes in standards and maintenance practices require significant improvements. Multiple drainages cross the trail along its length that have resulted in erosion and created safety hazards from broken terrain.

Purpose and Need

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

1. Provide improved traffic flow, pedestrian safety, parking areas, restroom facilities, and stormwater runoff control at Rush Landing.
2. Restore unobstructed traffic flow on Searcy CR 99 and improved trail access to the Ozark Highland Trail at this location.
3. Provide improved traffic flow and parking facilities at Hasty Landing, better stormwater runoff management, a more stable gravel-bar canoe access ramp, restored social trails which would reduce current bank erosion problems, and an improved restroom that is not located within the 100-year floodplain.
4. Improve the safety of the Lost Valley Trail by removing the existing trip hazards, correcting loose and uneven stone steps, improving safety on the trail to and at the entrance of Eden Cave, and making a portion of the trail near the parking lot and the amphitheater accessible to the mobility impaired without causing an impairment of the resource.

Relationship to Other Plans and Policies

Current plans and policy that pertain to this proposal include the 2000 BNR *Resource Management Plan* (NPS 2000) and the *Management Policies 2006* (NPS 2006). The 1977 BNR *Final Master Plan* has been superseded now by a new *General Management Plan* (GMP) that is currently being prepared by BNR staff. Following is more information on how this proposal meets the goals and objectives of these plans and policies:

- This project is fully consistent with the goals and objectives of the 2000 BNR *Resource Management Plan*, which does not prohibit any of the improvements described in the proposed action. As of the preparation of this EA, the proposed facilities improvements are also fully consistent with the goals and objectives, so far as they have yet been defined, of the new BNR GMP as it is currently being developed.
- The proposal is consistent with the goals and objectives of the *2006 National Park Service Management Policies* (Management Policies 2006) that state that major park facilities within park boundaries should be located so as to minimize effects to park resources. Three of the proposed sites for facilities improvements already exist and only involve modifications to enhance visitor experience. The fourth site, on Searcy CR 99 (Spring Creek Road), is fully consistent with the goals and objectives of the *Management Policies 2006*.

Appropriate Use

Section 1.5 of *Management Policies 2006*, “Appropriate Use of the Parks,” directs that the NPS must ensure that park uses that are allowed would not cause impairment of, or unacceptable effects on, park resources and values. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the park manager that it will not result in unacceptable effects.

Section 8.1.2 of *Management Policies 2006*, Process for Determining Appropriate Uses, provides evaluation factors for determining appropriate uses. All proposals for park uses are evaluated for:

- consistency with applicable laws, executive orders, regulations, and policies;
- consistency with existing plans for public use and resource management;
- actual and potential effects on park resources and values;
- total costs to the NPS; and
- whether the public interest will be served.

Park managers must continually monitor all park uses to prevent unanticipated and unacceptable effects. If unanticipated and unacceptable effects emerge, the park manager must engage in a thoughtful, deliberate process to further manage or constrain the use, or discontinue it.

From Section 8.2 of *Management Policies*: "To provide for enjoyment of the parks, the NPS will encourage visitor use activities that:

- are appropriate to the purpose for which the park was established, and
- are inspirational, educational, or healthful, and otherwise appropriate to the park environment; and
- will foster an understanding of and appreciation for park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources; and
- can be sustained without causing unacceptable effects to park resources and values."

Landings, trailheads, and trails are common and vital structures in most park units. Proper location, sizing, as well as construction materials and methods would ensure that unacceptable effects to park resources and values would not occur. The proposed facilities improvements are consistent with BNR's resource management plan and other related park plans. With this in mind, the NPS finds that construction and use of the proposed facilities improvements is an acceptable use at BNR.

The next question is whether such use, and the associated necessary and appropriate effects, can be sustained without causing unacceptable effects to BNR resources and values. That analysis is found in the *Environmental Consequences* chapter.

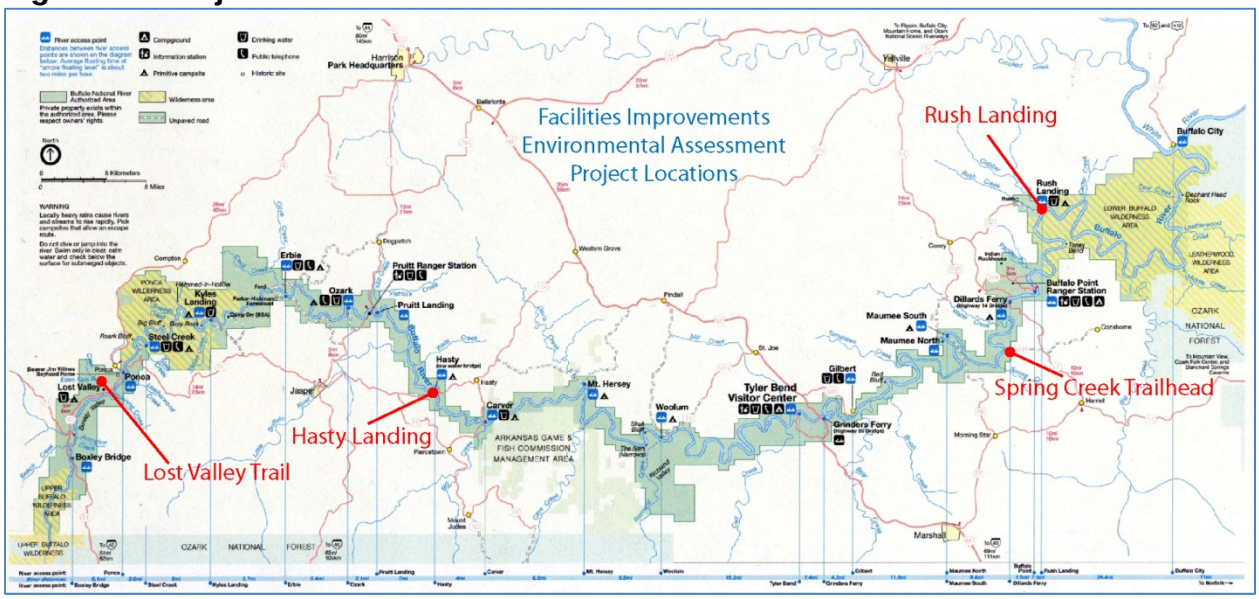
Scoping

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

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to improve facilities at BNR and to generate input for the preparation of this environmental assessment. The scoping letter dated May 25, 2010 was mailed to over 150 residents in the northern Arkansas region including landowners adjacent to the river. In addition, the scoping letter was mailed to various federal and State agencies, affiliated Native American tribes, local governments, and local news organizations. Scoping information was also posted on the NPS Planning, Environment and Public Comment (PEPC) website.

During the 30-day scoping period, 13 public responses were received. The majority of respondents were neutral about the proposed activities at Rush Landing, Spring Creek Trailhead, and Hasty Landing. Most of the comments focused on the importance of retaining the character of the Lost Valley Trail. The remaining responses included some in favor of the project, some opposed to portions of the project. In addition, during tribal consultation, no Native American tribes responded to the letters that were sent to them. More information regarding external scoping and Native American consultation can be found in *Comments and Coordination*.

Figure 1 – Project Location



Affected Environment

Impact Topics Retained For Further Analysis

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

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

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

Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The NPS under *Management Policies 2006* and Director's Order 77-2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 *Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains. The statement of findings is presented in Appendix C of this document.

In December 1982, rainfall in the Buffalo River watershed led to a discharge along the river that peaked at 158,000 cubic feet per second (Neely 1985) near St. Joe, Arkansas. This discharge, with a recurrence interval estimated at 65 years, caused widespread flooding along the Buffalo River. Even greater magnitude floods with recurrence intervals of 100 and 500 years have greater velocities, rise higher, and spread farther across the floodplain. The relatively steep slopes and narrow widths of the Buffalo River make it susceptible to flash flooding. Figure 2 was adapted from the Buffalo River Water Resource Management Plan (2004). The graph in Figure 2 shows a strong correlation between season and flooding. With the exception of the aforementioned 1982 December flood, there were no floods during the last four months of each year from 1991 through 1995.

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

BNR includes a number of facilities, such as campgrounds and river access points, that are located beside the river and are thus exposed to flooding. While floods may on occasion lead to temporary closure of such facilities, they do not generally cause major damage or destroy them.

Except for aquatic habitats associated with the river and its tributaries, BNR is not particularly known for wetlands (Cowardin et al 1979). It contains no marshes, swamps, or bogs of note.

The Federal Emergency Management Administration has not mapped BNR for flooding. Based on the observations of BNR staff, Rush Landing is subject to floods that can reach elevations higher than 50 feet above the normal base flow elevation during a 100-year flood. This type of flood results in water flowing over the parking lot and in the road and powerline right-of-way that lead to Clabber Creek and the Bowman tract.

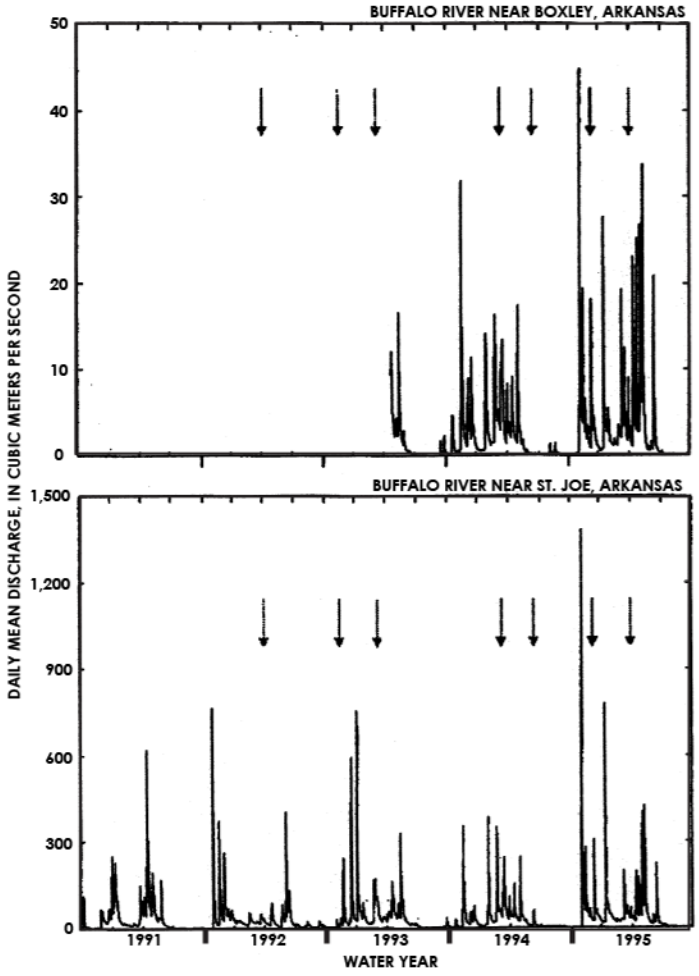
Spring Creek Road and the Ozark Highland Trail are located on high ground, well above the 500-year floodplain.

The parking lot at Hasty Landing is subject to flooding on an approximately five year basis. Flood depths up to 30 feet above normal have occurred at this location and water marks can be seen high in the trees on the banks of the river. The existing restroom at this facility is located slightly higher than the parking lot and has, therefore, avoided floods that only cover the parking lot. A 100-year flood would reach the restroom in its present location.

Some portions of the Lost Valley Trail on Clark Creek are subject to flash flooding during severe rain events. It is likely that most of the lower trail along the creek is within the 100-year floodplain for Clark Creek.

Figure 2 – Flood Data

Figure 12. Hydrographs of mean daily discharge from gauges at Boxley and St. Joe (McKenney, 1997)



Water Resources

The enabling legislation for BNR (Public Law 92-237) stipulates specific protections under Section 4 by stating that "…no department (including the NPS) shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary [of Interior]. Nothing contained in the foregoing sentence, however, shall preclude licensing of, or assistance to, developments below or above the Buffalo National River or on any stream tributary thereto which will not invade or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area on the date of approval of this Act."

The park is required to make a written evaluation and determination of the effects of projects that may have a direct or adverse effect on the values of the river. The values and purposes of the river include free-flow, water quality, scenic, and scientific features. Any water resources project that would be determined by the park to have a direct and adverse effect on or invade or unreasonably diminish the free-flow or the values of the river is prohibited under the law. BNR is afforded considerable protection from and statutory authority over internal and external

disturbances under the Organic Act (39 Stat. 535; 16 U.S.C. 1 et seq.) and through specific language (section 4 of the Act) that further limits construction activities that may harm the river from within the river corridor, up and downstream on the mainstem, or on its tributaries.

BNR drains an elongated basin, approximately 22 miles wide by 70 miles long, and covers 1,338 square miles. Flowing from the Boston Mountains in the west to the White River in the east, it follows a 153-mile winding course. Small tributaries enter at intervals. The geology and hydrology of the BNR watershed is unique because of a combination of factors such as karst geomorphology, steep topography, shallow soils and highly integrated ground/surface water. The river has 24 major tributaries within the BNR boundary (NPS 2004).

The Arkansas Department of Environmental Quality has designated BNR and Richland Creek (a tributary) as "Extraordinary National Resource Waters," providing the highest water quality standards and protection through a policy of non-degradation. The water quality of the river has remained relatively unpolluted due to the large amount of forested land, few point source pollution sources, and a relatively sparse population within the watershed. Water quality problems are related to high fecal coliform bacteria levels, sediment, loading, and nutrient enrichment from a variety of animal operations, sewage treatment operations, inadequate rural septic systems, and runoff from bare ground. Following several short-term water quality studies in the 1970s and early 1980s, the NPS initiated a regular water monitoring program in 1985.

All stream channels naturally shift and meander over time in the absence of human activity within their watershed, thus causing a certain amount of natural turbidity. Within the steep terrain of the Ozarks, stormwater runoff from unpaved roads and cleared land carries both fine and coarse sediments to tributaries of BNR. The dominant source of turbidity during high flow is from erosion of road surfaces and ditches, cattle pastures and other cleared land, and unprotected rapidly eroding cut-banks (NPS 2004). This turbidity results in an unnatural decrease in stream channel stability, eroding stream banks, and degraded aquatic habitat. One of the NPS's objectives at BNR is to identify the specific locations of these human-caused sources of turbidity and take action, where possible, to reduce or eliminate them.

A proposal for water impoundments was the key issue, among others, as an immediate threat to one of America's last, untouched wild rivers, leading to the establishment of BNR. BNR's enabling legislation prohibits the federal licensing of water-related projects on or directly affecting the river. The potential development of impoundments or diversion projects on major tributaries outside BNR boundaries remains a local issue and obtaining instream flow data to address this issue is a critical need.

Special Status Species

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

Letters were sent to the USFWS and the AGFC requesting input regarding protected species in the vicinity of the facilities where improvements are proposed. One response has been received from the AGFC. A copy of the letters and the AGFC response are included in Appendix A. Eleven protected species are identified for the three counties of Newton, Searcy, and Marion on

the USFWS Arkansas Field Office website (USFWS 2010) and the Arkansas Natural Heritage Commission website (ANHC 2010) and are presented in Table 1. A complete list, including those not protected, but listed for inventory, by the Arkansas Natural Heritage for the three county area are presented in Appendix A.

Table 1 – Federal and State protected species known to occur within BNR

Scientific Name	Common Name	Federal Status	State Status
Birds			
Haliaeetus leucocephalus	Bald eagle	BGEPA	INV
Fish			
Etheostoma moorei	Yellowcheek darter	C	INV
Invertebrates			
Lampsilis abrupta	Pink mucket	E	INV
Lampsilis streckeri	Speckled pocketbook	E	INV
Leptodea leptodon	Scaleshell	E	INV
Mammals			
Corynorhinus townsendii ingens	Ozark big-eared bat	E	INV
Myotis grisescens	Gray bat	E	INV
Myotis sodalis	Indiana bat	E	INV
Plants			
Dodecatheon frenchii	French's shooting star	-	T
Neviusia alabamensis	Alabama snow wreath	-	T
Silene ovata	Ovate-leaved catchfly	-	T
Silene regia	Royal catchfly	-	T

BGEPA = Bald and Golden Eagle Protection Act

E = Endangered

T = Threatened

C = Candidate

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

Swainson's Warbler (*Limnothlypis swainsonii*), which is listed as an Inventory Element by ANHC, but has no federal status, has been found in small numbers utilizing canebrake and other riparian habitat along the river. It is a migrant bird that breeds in mid-latitudes. One of its preferred breeding areas is canebrakes. It can be directly affected by activities such as trail construction, maintenance, and use of its habitat and other disturbance events during its nesting period. Canebrakes are present at both Rush and Hasty landings.

Bald eagles winter along larger streams and water bodies in the southern United States. This species relies on rivers for most of its food. It typically roosts on large trees or snags on banks and hillsides overlooking water. There have been no nesting pairs of this eagle found within the boundary of BNR since the species was removed from protection under the Endangered Species Act. As of 2003, each winter for most of the previous twelve years, an eagle survey was

performed by BNR staff. The survey was conducted as a one-day, intensive search designed to cover as much of the river as possible. The lower sections of the river have a wintering population of approximately one eagle per two river miles. (NPS unpublished records).

Yellowcheek darters are only known to occur in the Little Red River basin above Greer's Ferry Lake and speckled pocketbooks are only known to occur in the Little Red River. Neither species is present in BNR (Hodges 2010a, 2010b).

Pink mucket and scaleshell mussels have not been found in BNR to date (Hodges 2010). Snuffbox mussels (Epioblasma triquetra) are currently a candidate species for listing by USFWS as endangered under ESA. Although this mussel has only been found in BNR near the confluence with the White river, its host species is common throughout BNR. Surveys for this species in BNR by USFWS are being planned for August 2010, which should provide more detailed information about its distribution in the river. A functioning mussel bed is present in the first deep pool downstream from Rush Landing. There are no functioning mussel beds in the immediate vicinity of Hasty Landing; however, there could be functioning mussel beds farther downstream that could potentially be affected by the proposed improvements at Hasty. For the purposes of analysis in this EA, it is assumed snuffbox mussels are present in the areas of potential effect for the proposed improvement projects at Rush and Hasty Landings as described in this EA.

Ozark big-eared bats roost in caves and mines year round. Colonies are small, generally under 1,000 individuals. They tend to roost near the entrances of caves and mines and have been found roosting in rock overhangs, talus piles, and other fairly exposed locations (NPS 2010). These are large bats which prefer to forage in open forests or on forest edge (USFWS 1995). Ozark big-eared bats forage over fields, streams, forest edges, mountain slopes, cliff faces, and in clearings. They feed primarily on small moths, though they will also catch and eat beetles (NPS 2010). Their summer roost requirements are variable. They may roost in caves proper, or in fractures in limestone or sandstone bluffs. In winter they require a cave which will act as a cold trap and maintain a temperature between 0 and 13 degrees Celsius. The humidity must be between 60 and 97 percent (USFWS 1995). There are three caves and one abandoned mine within the boundaries of BNR known to house one or two individuals of this species over the past fifteen years. None of these caves are present in proposed project locations, though there are three winter roosts within four miles of Rush (NPS 2003). This implies that the project area may be used for foraging purposes by the bat.

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

BNR has seven hibernacula, one maternity roost, and eight summer roost sites for this species. As of 2003, population data had been collected by NPS, AGFC, and other researchers for the previous 18 years (NPS 2003). As a result, there are twelve caves and two abandoned mines which are known to support Gray bats during some part of each year at BNR. Five of these caves and one of the abandoned mines are used as hibernacula. One of the caves is a maternity roost. Eight caves and one abandoned mine are used as summer roosts by males or non-reproducing females. The difference in the numbers reported here is a result of one cave being used both as a summer roost and winter roost. None of these caves are present in the

proposed project locations. The largest winter colony of gray bats in Arkansas is located four miles from Lost Valley, so the area may be within the foraging range of the gray bats. There are several sizable gray bat colonies within five miles of Rush. These are summer colonies, including one maternity colony. It is likely that Rush is in the foraging area for this species. There are three gray bat colonies within five miles of Hasty Landing. It is likely that Hasty is within the foraging area of one or more of these colonies.

Indiana bats roost in caves during the winter in colonies of up to 100,000 individuals. In the summer they tend to roost and raise their young under the sloughing bark of snags and under the bark of shagbark hickory (*Carya ovata*), green ash (*Fraxinus pennsylvanica*), elm (*Ulmus* sp.), cottonwood (*Populus deltoides*) and other trees with large loose bark plates. These summer roosts tend to be in lowland habitats near water, with direct sun exposure for half the day or more (NPS 2010). The colonies are most commonly located in bottomland or riparian areas, but have also been found in pastures and upland hardwoods. The maternity roosts are usually found in larger diameter trees. They are not generally a cavity-roosting species. Primary maternity roosts are generally located where they receive considerable sunlight. This may assist with pup development. Typically, roosts will be higher in the tree if the canopy closure is greater. This may be an effort to get more sunlight on the roost (Menzel et al 2001).

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

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

A special status plant survey was conducted at Rush Landing on April 19, 2010, by the BNR botanist and documented in a Memorandum for the Record (MFR) (NPS 2010a). The survey resulted in the identification of a small population of Ozark cornsalad (*Valerianella ozarkana*) in one location near the powerline right-of-way to Clabber Creek and the Bowman tract. On July 7, 2010, special status plant surveys were conducted at Spring Creek Trailhead in the area proposed for the parking lot and at Hasty Landing in the area of potential effect (NPS 2010a). A

single, 18-inch-tall, Ozark chinquapin (*Castanea ozarkensis*), a tree species currently under review for protection by the USFWS under the ESA, was identified near the area proposed for the Spring Creek Trailhead parking lot. No special status species were found at Hasty Landing.

A special status plant survey was conducted along the Lost Valley Trail on July 12, 2010 by the BNR botanist (NPS 2010a). Arkansas alumroot (*Heuchera villosa* var. *arkansana*) is known to occur on bluffs and in boulders in the Lost Valley Trail area, particularly near Eden falls. Both of these species are listed as Inventory Elements by the ANHC and have no federal status. Two other plants listed by the ANHC as inventory elements occur along the trail at Lost Valley. These two species are commonly poached; therefore, their names and specific locations are not disclosed in this EA. No other species, either protected or of special concern, are specifically known to occur within the proposed project areas.

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

Archeological Resources

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

The archeologicalresources at BNR chronicle 12,000 years of human activity. The river watershed evolved as individual pockets of humanity, distinctively individual from one end of the river to the other. Settled first by prehistoric gatherers, utilized by modern Native American groups for hunting, gathering, and possibly homes, and finally by settlers from the mountains of North Carolina and Tennessee and later many states, the resources reflect the inhabitants' cultural adaptation to an isolated and sometimes harsh southern mountain environment. It is the story of kinship and settlement, the growth of small river communities and social traditions, the use of river and land transportation to enter into a wider world of commerce and a change from agriculture to modern industry and recreation.

BNR contains numerous prehistoric and historic archeological sites, over 500 recorded as of 2003, spanning almost 10,000 years of human history (NPS 2003). A common occurrence at BNR is the overlay of historic structure upon historic archeological site upon prehistoric archeological site. Site condition varies from good to destroyed, with impact levels varying from low to severe.

Known prehistoric sites extend from the Dalton Period (circa 8500-7900 BC) to the Mississippian (circa AD 900 to AD 1541). Prehistoric archeological resources at BNR have been found in cave shelters, bluff shelters, open sites such as river terraces, and upland sites such as rocky outcrops. Cherty limestone outcrops along the rivers length contributed material for widespread tool making. Resources include both objects and structures. Objects are the typical

expression of archeological resources of BNR. Stone flakes, as well as finished tools or portions thereof, are found throughout the river on agricultural terraces and upland shelter sites. Less common, but found over the past 50 years are the remnants of ceramic pottery, fiber cordage, basketry and footwear, as well as charcoal and plant and animal "leftover" components from food storage/preparation (NPS 2003).

Structural sites have recently been added to the finds within BNR boundaries. The discovery of a baking oven in the Boxley area and the remains of the first known prehistoric house structure in the Arkansas Ozarks (at Erbie) demonstrate the high significance of this largely unknown resource. Until recently, the Native Americans occupying the Ozarks were believed to make use of natural bluffs and caves for shelter rather than constructing dwellings. Archeological testing during planning prior to the development of the Erbie campground (1986-87) revealed post molds that indicated the use of constructed "pole house" shelters comparable to Mississippian sites elsewhere in the southeast. Burial sites have been discovered within the boundaries of the national river and are protected by federal and State laws (NPS 2003).

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

A comprehensive cultural landscape inventory has not been funded for BNR. There are some who believe that the entire national river may be one large cultural landscape in which are contained smaller, distinct elements. Although it is unknown which distinct cultural landscapes exist within BNR's boundaries, BNR treats designated historic districts as potential cultural landscapes. Other potential areas include community sites, Civil War sites, and agricultural settlement areas. For the most part, fence-lines and old roadways are left in place to mark settlement patterns. Special use hay permits and historic leases maintain selected pastoral landscapes.

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

Research and inventory studies prior to development in the Rush area recommended a number of sites as eligible for the National Register with the conclusion that undoubtedly more sites would be found. Recent findings have verified the intensity and prevalence of prehistoric occupation of the region, and shed new light on the degree of civilization and development achieved by those early settlers of this drainage basin.

Rush is a 1,300-acre area on the National Register of Historic Places and is entered on the NPS cultural landscape inventory as one of the designated cultural landscapes at BNR. Forty-seven historic surface structures, ranging from ruins to standing buildings, are visible in various locations in the Rush Historic District. Roadways and zinc mines are also considered part of the structural listing. Buried historic and prehistoric archeological resources likely occur almost anywhere in the Rush Landing area. Mapping of surface remains from the White Eagle Mine and Mill was undertaken and the proposed location of the walking trail from the launch ramp up to the restroom was investigated for archeological resources in April 2009 (Vawser 2009). Subsurface testing revealed very heavily disturbed mix of prehistoric and historic mining materials.

Uplands within BNR located well away from the river like the area proposed for the Spring Creek Trailhead parking lot are generally devoid of cultural resources (Clark 2010). Both historic and prehistoric settlements typically occurred closer to the river and its tributaries. Easy access to a source of surface water was a critical component of site selection for settlers before technologies for drilling deep wells or pumping water through pipes became available. A cultural survey was conducted of the proposed Spring Creek Trailhead parking lot area on April 2, 2010, by the BNR archaeologist. No cultural resources were found. No cultural resources are likely to exist at the proposed location for the parking lot at the Spring Creek Trailhead.

A prehistoric site was recorded at Hasty Landing in 1970 as a 10-acre lithic scatter. No other information is known about this location, although the landing's location on a river terrace suggests potential for buried archeological deposits. Since no other investigations have been made to identify cultural resources at Hasty Landing, no other documented archeological sites have been identified there.

The cultural resources of concern at Lost Valley pertain to the historic State Park facilities, and for this project, the trail in particular. There are no known Native American remains within the area of potential effect at Lost Valley and no other cultural resources recorded for the area (Clark 2010a).

Visitor Use and Experience

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

Visitation statistics are kept by the NPS at all of the national parks, rivers, and monuments. Visitation data for BNR can be found online at: http://www.nature.nps.gov/stats/park.cfm (see Appendix B). An explanation of how the counting is done can also be found at this website. December, January and February are the periods of lowest visitation with less than 40,000 visitors per month in 2009. Visitation peaked in June 2009 with over 300,000 visitors that month. Total visitation in 2009 was 1,522,586.

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

and equestrians multiple opportunities to enjoy the Ozark Mountains with their rich variety of forests and pastures.

Rush Landing is the last developed and maintained takeout point from the river within the BNR boundary. As such, it is a very busy location during peak visitation periods. Visitors putting watercraft into the river upstream with the intention of taking out at Rush generally leave their vehicles and trailers here while they are on the river to simplify and expedite the takeout process when they arrive by the river. This is particularly the case with BNR concessioners that provide guide services on the river.

Where the Buffalo River Trail crosses Spring Creek Road/Searcy CR 99, for convenient access to the trail, visitors frequently park their vehicles along the side of the road.

Hasty Landing is located near the midpoint of the river within BNR. With the upper reaches of the river being faster flowing and more challenging for navigation and the lower reaches being slower-flowing and less challenging, Hasty makes both a good put-in and takeout point. The gravel bar accessed via the Hasty parking lot is an excellent location for staging canoes and other river gear for large groups or even multiple large groups. These features make Hasty Landing a popular facility at BNR.

Visitors also frequently visit Lost Valley with its associated trail, natural bridge, waterfalls, and readily accessible cave. The Lost Valley Trail is an approximately one-mile day-use trail that follows Clark Creek for most of its course. Near the end of the trail, it turns uphill at a natural bridge and waterfall (Eden Falls) to terminate at Eden Falls Cave. Beyond the first 0.25 mile, the trail is unimproved except for native stone steps in some locations and a few drainage crossings that have been stabilized with native stone. It provides an excellent and readily accessible frontcountry day-hike on varying terrain through forest containing an abundance of beech trees and other flora and fauna. It currently receives the highest visitor use of any trail at BNR.

Impact Topics Dismissed From Further Analysis

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

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

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

Geology, Topography, and Soils

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

While there are significant topographic and geologic features within BNR, none of these features are found within the area that would be affected by proposed improvements at Rush Landing, Spring Creek Trailhead, or Hasty Landing. Improvements planned at Lost Valley, including a handrail at Eden Cave, would not alter either the topography or the geology of that area. Grading operations at Rush, Spring Creek, and Hasty would create a temporary soil erosion hazard; however, in the long-term, these improvements would serve to reduce this hazard at both Rush and Hasty Landings and have a negligible effect at the Spring Creek Trailhead. The proposed improvements would result in negligible, short-term adverse effects to soils and no effects to topography or geology. Further, such effects would not result in any unacceptable effects; the proposed improvements are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are negligible or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this EA.

Vegetation

According to the NPS's *Management Policies 2006*, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006).

Plant communities at BNR are rich and diverse. The ridges, bluffs, hillsides and valleys provide a variety of habitats, supporting over 1,500 species of plants. The major forest types are Floodplain, Mixed Hardwood, Oak-Hickory, Oak-Pine, Cedar Glade, and Beech Forests, cultivated fields (mostly consisting of hay and other cattle forage grasses), fields being restored to warm grass communities, and abandoned fields at different stages of ecological succession are present throughout the area (NPS 2005).

Approximately one-seventh acre of vegetation would be cleared to implement the proposed improvements. Most of the work would be conducted in areas already disturbed and free of vegetation. Disturbed areas not permanently converted to gravel would be rehabilitated and vegetation restored following construction; therefore, removal and/or disturbance of vegetation in the project area is expected to result in negligible to minor adverse effects to vegetation. Further, such minor or negligible effects would not result in any unacceptable effects; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable effects, this topic is dismissed from further analysis in this EA.

Wildlife

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

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

During construction, noise would also increase, which may disturb wildlife in the general area. Construction-related noise would be temporary and existing sound conditions would resume

following construction activities. Therefore, the temporary noise from construction would have a negligible to minor adverse effect on wildlife.

There would be a negligible overall loss of wildlife habitat. Further, such minor or negligible effects would not result in any unacceptable effects; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable effects, this topic is dismissed from further analysis in this EA.

Ethnographic Resources

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

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

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

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

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

- the Wichita and Affiliated Tribes.

BNR staff have attempted to contact the affiliated Tribes through normal channels; however, none of the Tribes have demonstrated any interest in the proposed actions. The lack of responses is interpreted to indicate that no effects to significant ethnographic resources would be expected. The proposed actions, therefore, are consistent with §1.4.7.1 of NPS *Management Policies 2006*. Because there would be no effects to ethnographic resources, this topic is dismissed from further analysis in this EA.

Paleontological Resources

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

In addition to these fossils, there is a depositional structure across Clark Creek from the “hollow beech tree” which has been interpreted as a Waulsortion mound, or a pseudo-Waulsortion mound. No other paleontological resources are known to occur within the areas of potential effect of the other proposed improvements described in this EA.

There would be no effects to paleontological resources. Further, there would be no unacceptable effects; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies 2006*. Because these effects are minor or less in degree and would not result in any unacceptable effects, this topic is dismissed from further analysis in this EA.

Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) was established to promote the public health and welfare by protecting and enhancing the nation’s air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with NPS units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. The majority of BNR, including all of the improvement project locations, is designated as a Class II air quality area under the Clean Air Act as amended (NPS 2003a). A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in §163 of the Clean Air Act. State air quality laws and regulations are available on-line at the Arkansas Department of Environmental Quality website (ADEQ 2010).

Construction activities such as hauling materials and operating heavy equipment could result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized and would likely dissipate rapidly because air stagnation at BNR is rare. Overall, the project could result in a negligible degradation of local air quality; however, such effects would be very short-term, lasting only while construction activities involving heavy equipment are being used. The Class II air quality designation for BNR would not be affected by the proposed action. Further, because the Class II air quality would not be affected, there would be no unacceptable effects; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because there would be no effects on air quality, and the proposed actions would not result in any unacceptable effects, this topic is dismissed from further analysis in this EA.

Soundscape Management

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

During construction, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be short-term, lasting only as long as the construction activity is generating the sounds, would generally be confined to the immediate vicinity of the construction activities, and would have a minor adverse effect on visitors and employees. Operation of the facilities upon completion of construction may result in a negligible reduction in human-caused sounds at Rush and Hasty Landings if visitors can more quickly and easily park their vehicles at these locations. Such negligible effects would be consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are negligible or less in degree and would not result in any unacceptable effects, this topic is dismissed from further analysis in this EA.

Lightscape Management

In accordance with *Management Policies 2006*, the NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). BNR strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. There are no lights at any of the facilities where improvements are proposed and no new lights are included in the proposed action; therefore, there would be no effects to the natural ambient lightscape as a result of the proposed improvements. Because there would be no effect to the Lightscape, this topic is dismissed from further analysis in this EA.

Socioeconomics

The proposed action would change neither local nor regional land use nor appreciably affect local businesses or other agencies in an adverse way. Implementation of the proposed action could provide a negligible beneficial impact to local small businesses, such as BNR concessioners, due to improved accessibility at Rush and Hasty Landings. Because the effects to the socioeconomic environment would be negligible and likely beneficial, this topic is dismissed from further analysis in this EA.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. Both categories require that the land be available for farming uses. None of the lands that would be affected by the proposed action are available for farming and, therefore, do not meet these criteria. Because there would be no effects on prime or unique farmlands, this topic is dismissed from further analysis in this EA.

Indian Trust Resources

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

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

Environmental Justice

Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Because the facilities improvements would be available for use by all visitors regardless of race or income, and the construction workforces would not be hired based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Because there would be no disproportionate effects, this topic is dismissed from further analysis in this EA.

Climate Change and Sustainability

Although climatologists are unsure about the long-term results of global climate change, it is clear that the planet is always experiencing cyclic warming and cooling trends that affect ocean currents, sea levels, polar sea ice, and global weather patterns. Although these changes will likely affect winter precipitation patterns and amounts in the parks, it would be speculative to predict localized changes in temperature, precipitation, or other weather changes, in part because there are many variables that are not fully understood and there may be variables not currently defined. Therefore, the analysis in this document is based on past and current weather patterns and the effects of future climate changes are not discussed further in this EA.

ALTERNATIVES

Since early 2006, an interdisciplinary team of NPS employees has been discussing the project alternatives. These discussions led to the definition of project objectives as described in the *Purpose and Need,* and a list of alternatives that could potentially meet these objectives. One action alternative and the no-action alternative were originally identified for this project. No other action alternatives were dismissed from further consideration for reasons described later in this chapter. One action alternative and the no-action alternative are carried forward for further evaluation in this environmental assessment. A summary table comparing alternative components is presented at the end of this chapter.

Alternatives Carried Forward

Alternative A – No-Action

Under this alternative, almost none of the improvements described in the action alternative would be constructed. The existing facilities would continue to provide visitors with the same functions they have now. The facilities at Rush and Hasty Landings would remain the same. No parking area would be constructed at the Searcy CR 99/Buffalo River Trail crossing. Lost Valley Trail would remain as is with only basic trail maintenance carried out from time to time to maintain its present condition or possibly to remove safety hazards such as rocks and roots, and secure loose stone steps. Should the no-action alternative be selected, the NPS would respond to future needs and conditions of these facilities without major actions or changes in the present course of action.

Alternative B – Construct Facilities Improvements

This alternative consists of construction at four locations within BNR, Rush Landing, Searcy CR 99 at the crossing of the Buffalo River Trail, Hasty Landing, and Lost Valley. With the partial exception of the Searcy CR 99/Buffalo River Trail crossing, these areas have all previously experienced disturbances from construction. The following text further describes the components of Alternative B:

Rush Landing

- **Planned Improvements** – Trees and brush would be cleared along the side of the ramp exit road and a pedestrian trail would be constructed up the hill so that foot and vehicular traffic would not have to use the same roadway (see Appendix B). An additional Romtec restroom would be added next to the existing Romtec restroom facility. Drainage culverts would be installed at the top and bottom of the ramp exit road to improve drainage and reduce surface erosion and water quality degradation. The road along the river that leads to Clabber Creek and the Bowman Tract, past Rush Landing, would be widened where needed to allow for two-way traffic flow. The power line to the Bowman Tract would be removed and additional parking spaces for concessionaire buses would be created in the right-of-way. A turnaround would be constructed approximately 75 to 100 yards down the road using the old power line right of way. This would allow vehicles waiting to use the landing to line up in a location that does not block traffic coming into and leaving the landing area. All excavated material would be removed and stored offsite.


Powerline Right-of-Way at Rush

- **Use/Operation of the Facility** – The improved facility would continue to be primarily for use by visitors.
- **Utilities** – The only existing utility in the area is the powerline that currently leads to the Bowman tract. Since the houses on the Bowman tract are no longer occupied, the powerline is no longer necessary; therefore, it would be removed to make room for additional parking.
- **Access** – Access to the ramp would be improved by altering the current flow of traffic so that vehicles in waiting would line up along the side of the road to Clabber Creek and the Bowman tract instead of backing up along the entrance road. Access to the new restroom facility would remain the same except for pedestrian traffic walking up the hill, which would use the new trail constructed along the side of the ramp exit road (see drawing Appendix B).

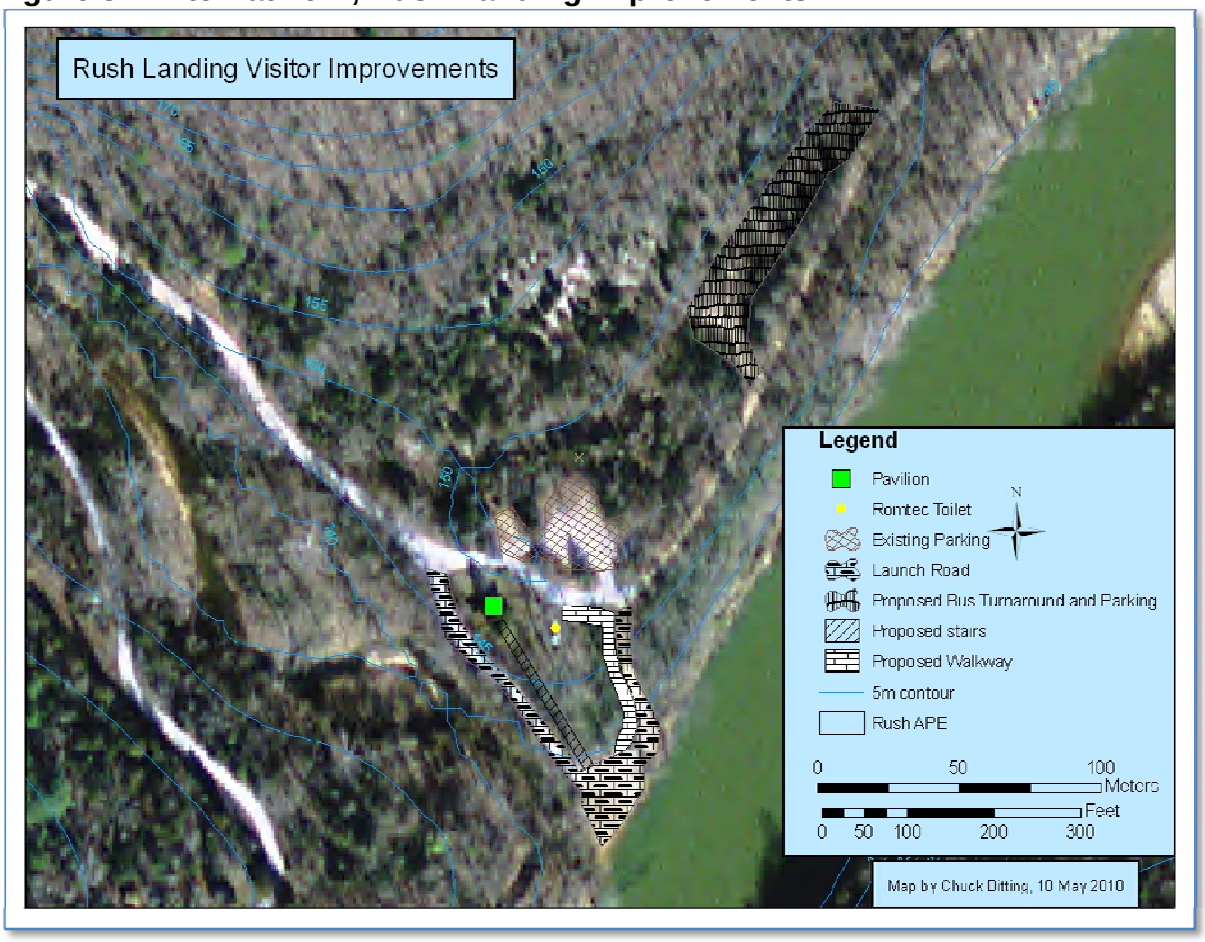
- **Parking –** The original footprint of the existing parking area would be restored to make more effective use of the space. Additional parking would be added within the powerline right-of-way in order to alleviate some of the demand for the existing space. The existing parking area, new parking space in the powerline right-of-way, access road to Clabber Creek and the Bowman tract, the new turnaround, and new trail to the restroom facility would be graded and surfaced with approximately 190 cubic yards (CY) of local, crushed gravel. Access to the new parking areas would come from two locations along the road to the Bowman tract. Gravel presently stored in the parking lot would be removed and stockpiled at an offsite storage area by BNR.
- **Revegetation** – The existing trees in the project area would be preserved to the extent possible; however, up to one-tenth acre of trees and undergrowth may be removed during construction. All areas disturbed by construction of the improvements would be revegetated and recontoured to the style of the native landscape. Native vegetation, rocks, or other natural features would be used, as appropriate.

- **Construction Staging** – To implement this alternative, the existing parking lot and powerline right-of-way would be used for construction staging, material stockpiling, and equipment storage. This work would be performed during the winter when visitor use is lowest. Access to the river would be maintained at all times during construction. Temporary signs would be used to direct

vehicle and pedestrian traffic around areas under construction.

- **Environmental Protection** – As required by the Clean Water Act (CWA), the NPS would obtain, prior to the initiation of construction activities, all required Stormwater Construction permits, which include the requirement to complete an erosion control plan and use Best Available Technology to ensure the project does not contribute sediments and oily run-off from construction vehicles to the river.

Figure 3 – Alternative B, Rush Landing Improvements



Spring Creek Trailhead

- **Planned Improvements** – Trees and brush would be cleared in an area approximately 40 feet by 50 feet to make room for a new access road and parking area that would accommodate up to four vehicles adjacent to Spring Creek Road (Searcy CR 99) just inside the BNR boundary. Vehicles with trailers would not be accommodated by this parking lot as the Buffalo River Trail is designated for pedestrian use only, not equestrian use (NPS 2003). This new parking area would be graded and graveled and include a short connection to the Buffalo River Trail. Appropriate signs to direct hikers to the trail and a bulletin board for posting information for visitors about the parking area and the trail would also be installed.
- **Use/Operation of the Facility –** The new facility would replace the existing practice by visitors of parking along the side of Searcy CR 99.

- **Utilities** – This facility would not require any utilities.
- **Access** – Access to the Buffalo River Trail would be improved by relocating vehicle parking and diverting pedestrian traffic off of the Searcy CR 99 roadway.
- **Parking** – The shape and size of the parking area would be designed to accommodate safe, easy ingress and egress by motor vehicles. Approximately 25 to 50 yards of local crushed gravel would be used to cover the parking area and access road. Bump blocks for the parking spaces would be installed and boulders would be used to define the boundary of the parking area and prevent vehicles from being driven into the woods around the parking lot.
- **Revegetation** – Very little revegetation would be required because the only area cleared and grubbed for the project would be that which would either be graveled for vehicle traffic or packed down for pedestrian traffic. Any excess areas disturbed by construction would be revegetated using native species.
- **Construction Staging** – One lane of vehicular traffic would be maintained passing the construction zone on Searcy CR 99 throughout the construction phase. The parking area would be used for staging and storage of materials and equipment until construction is completed. Temporary signs would be used to direct traffic and hikers around the construction zone until the new parking area is open for public use.
- **Environmental Protection** – As required by the CWA, the NPS will obtain all required Stormwater Construction permits, which include the requirement to complete an erosion control plan and use Best Available Technology to ensure the project does not contribute sediments and oily run-off from construction vehicles to the river.