



Backcountry Management Plan / GMP Amendment / Environmental Assessment



DECEMBER
2021



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CHAPTER 1: PURPOSE AND NEED

BACKGROUND

Wupatki National Monument (referred to as “the monument” or WUPA in this document) protects one of the most densely populated archeological landscapes in the Southwest. Established through a presidential proclamation by Calvin Coolidge in 1924, the monument’s core included two separate parcels preserving the prehistoric archeological sites of Citadel and Wupatki Pueblo, about 26 miles north of Flagstaff, Arizona. In the years following, Wupatki National Monument’s boundaries were enlarged in 1937, reduced in 1941, and then enlarged again in 1961 and 1996. The monument now encompasses more than 35,000 acres of open, rugged lands characterized by dramatic geologic features, climatic extremes, scarce water, and a diverse range of plant and animal species. Wupatki National Monument is most renowned for its exceptionally well-preserved archeological record, with around 2,700 known archeological sites dating mostly to the period after the eruption of nearby Sunset Crater Volcano in the late 11th century. A wilderness eligibility assessment signed by National Park Service (NPS) Director Jon Jarvis in 2013 found the majority of lands within the monument—roughly 96.5% of its total acreage—are eligible for wilderness designation. The National Park Service refers to these lands as the *Wupatki eligible wilderness* and manages them in accordance with Section 6.3.1 of *NPS Management Policies 2006* to preserve wilderness character and ensure no action is taken that would diminish the eligibility of the area for future wilderness designation.

Currently, visitor use is concentrated at the monument visitor center and four primary archeological areas: Wupatki Pueblo, Wukoki, Citadel and Nalakihi, and Lomaki Pueblo and Box Canyon Pueblos. These areas have been developed for public use, with short, self-guided trails and interpretive media. However, most of the monument, including eligible wilderness, remains undeveloped and is closed to unguided visitor entry under management zoning outlined in the monument’s general management plan (GMP). The general management plan was finalized with an approved record of decision (ROD) in 2004 and minor modifications to the GMP management zoning were formalized through a categorical exclusion process in 2020. Under the general management plan, access to the backcountry is limited to individuals with research permits, tribal access, or visitors taking part in NPS-guided activities. The National Park Service periodically offers ranger-led discovery hikes to destinations in the undeveloped backcountry portions of the monument. These guided hikes allow visitors to explore and experience the rich cultural and biological landscape found within Wupatki National Monument. Over time, monument staff and the public have expressed growing interest in reevaluating the general management plan and determining if portions of the backcountry could be opened for unguided visitor experiences without harming the resources the monument was established to protect. Additionally, the National Park Service wishes to revisit and amend certain elements of the monument’s general management plan to support enhanced visitor access and use and resource protection. Updated management zoning would include management considerations associated with eligible wilderness. Desired conditions for the eligible wilderness could inform a future wilderness study.

PROJECT AREA FOR THIS PLAN

As explained in *Reference Manual 41: Wilderness Stewardship*, “The term backcountry is a generic descriptor for areas of a park unit outside of highly developed front-country zones. Nearly all wilderness-eligible lands are within undeveloped backcountry areas in existing parks.” The project area for this backcountry management plan includes the approximately 34,457 acres of undeveloped areas of the monument that were included within the general management plan’s Resource Protection Zone (31,859 acres) and the Guided Adventure Zone (2,598 acres). This includes the four areas (totaling approximately 34,198 acres) within the monument that were determined to meet the criteria for eligible wilderness consistent with NPS *Management Policies 2006* and the Wilderness Act (figure 1).

NPS lands managed to preserve wilderness character and backcountry areas may appear to be similarly wild and natural landscapes. However, there are important policy distinctions between how these lands must be managed. While there are similarities between backcountry and lands managed as wilderness under NPS *Management Policies*, Chapter 6, more management discretion exists within backcountry areas than eligible wilderness. The Wilderness Resource Management section of NPS *Management Policies 2006* requires that “In addition to managing these areas [i.e., wilderness, including areas eligible for wilderness] for the preservation of the physical wilderness resources, planning for these areas must ensure that the wilderness character is likewise preserved” (6.3.1). Additionally, the section states that “the National Park Service will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed,” and that “until that time, management decisions will be made in expectation of eventual wilderness designation” (6.3.1). Accordingly, this backcountry management plan is a strategy to meet NPS policy mandates to guide the preservation, management, and use of the all backcountry areas of the Wupatki National Monument, including eligible wilderness (NPS *Management Policies 2006*: 8.2.2.4).

Separate from this planning effort, the National Park Service will pursue a wilderness study to determine whether a formal wilderness proposal should be submitted by the NPS director for consideration by the Department of Interior. That wilderness study would build upon the 2013 wilderness eligibility assessment and more recent analysis to determine whether the National Park Service should propose lands for wilderness designation or for potential wilderness and the boundary for those lands as appropriate. This backcountry management plan and all associated decisions would apply to any category of wilderness at the monument and would continue to apply as the National Park Service fulfills future obligations with regard to wilderness management.

PURPOSE OF THE WUPATKI NATIONAL MONUMENT BACKCOUNTRY MANAGEMENT PLAN AND GMP AMENDMENT

The purpose of this backcountry management plan is to provide for the protection and preservation of irreplaceable resources and wilderness character while establishing long-term direction for public access and experience of eligible wilderness and other backcountry lands and monument operations in those areas.

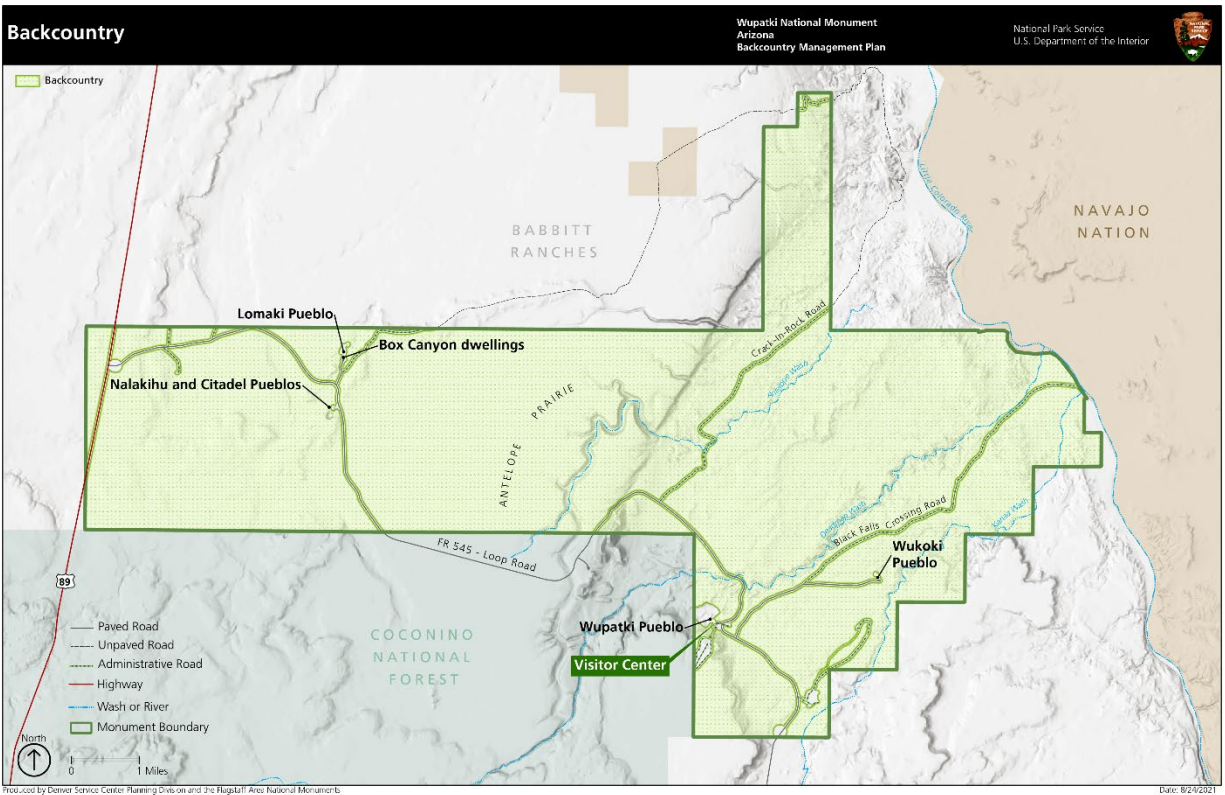


Figure 1. Backcountry Management Plan Project Area

NEED FOR THE BACKCOUNTRY MANAGEMENT PLAN AND GMP AMENDMENT

The backcountry management plan is needed to resolve management issues and to meet legal and policy requirements. The following bullets summarize the need for the plan, including key planning issues to be addressed:

- **Reevaluate Appropriate Public Access, Use, and Experience under the 2004 general management plan (2004 GMP).** As a result of the 2013 wilderness eligibility assessment findings, the National Park Service needs to revisit decisions from the 2004 GMP related to visitor use management, such as the types, locations, and timing of visitor uses, and establish new strategies for managing use so that visitor opportunities in the backcountry are balanced with preservation of wilderness character and other resources and values. In addition, the National Park Service needs to identify resource indicators and thresholds to monitor changes in condition as well as visitor capacities in fulfillment of legal requirements (1978 National Parks and Recreation Act).
- **Reevaluate GMP Closure of the Backcountry.** The backcountry closure described in the 2004 GMP remains in effect; however, it greatly restricts visitor opportunities to experience solitude or a primitive and unconfined type of recreation—one of the qualities of wilderness character. There is a need to reevaluate this decision in light of the wilderness eligibility assessment findings and growing interest in providing additional visitor opportunities in the backcountry and to determine whether to maintain or modify the closure through official regulatory actions.

ISSUES ANALYZED IN THIS PLAN

- Visitor Access and Experience
- Wilderness Character: Solitude or Primitive and Unconfined Recreation
- Cultural Resources

DESIRED CONDITIONS

Desired conditions are statements of aspiration that describe resource conditions, visitor experiences and opportunities, and facilities and services that an agency strives to achieve and maintain in an area. They help park managers answer the question, “What are we trying to achieve?”

According to NPS *Management Policies 2006*, “Through its planning processes, the Park Service will determine the desired future conditions for each park unit and identify a strategy to achieve them” (4.1). This plan establishes desired conditions for natural and cultural resources that apply to all backcountry areas of the monument, including eligible wilderness. The following desired conditions are based on guidance from previous planning efforts—including the 2004 GMP, the 2017 wilderness character narrative and baseline monitoring assessment (Building Blocks for Wilderness Stewardship), and the monument’s 2015 foundation document—and are an update to the desired conditions in the 2004 GMP. These desired conditions are based on Wupatki National Monument’s fundamental resources and values, associated visitor experience opportunities, and the types and levels of management, development, and access that are appropriate in different locations. Desired conditions updated during this planning process guided development of the backcountry management plan, the management actions proposed in chapter 2, and visitor use management strategies included in this plan.

Overall Desired Conditions for Backcountry Areas of Wupatki National Monument

The following desired conditions for natural and cultural resources apply to all backcountry areas of Wupatki National Monument, regardless of management zone. Desired conditions for wilderness character apply to eligible wilderness (i.e., the vast majority of backcountry areas).

Cultural Resources

1. All cultural sites, including ethnographic, prehistoric, and historic resources, and traditional cultural properties, are stable and preserved.
2. Cultural sites contain important physical traces of the cultures, communities, and families that made their homes in the Wupatki National Monument landscape and tell the story of the human experience through time.
3. Resource managers make efforts to accommodate traditional practices and sacred site visitation for tribal members.
4. Sites are identified and inventoried and their significance determined and documented.
5. Authorized artifact collections are protected and safely stored.
6. Natural landscapes are resilient to climate change and visitor use, which supports the preservation of both natural and cultural resources.

Natural Resources

1. The Wupatki National Monument backcountry retains its prehistoric and historic character and influence, remaining undeveloped with natural processes and disturbances occurring without manipulation.
2. The backcountry's juniper savanna, grasslands, and desert shrub lands are undisturbed and provide unique habitats and microclimates for local wildlife and native plant species.
3. Landscape scale habitats are maintained and protected. Species roam across the backcountry to maintain their natural range and movement patterns through habitat connectivity.
4. Functional soils, healthy vegetation cover, and natural geomorphic processes deter unwanted erosion or deposition.

Wilderness Character

1. The four qualities of wilderness character—"untrammeled," "natural," "undeveloped," and "solitude or primitive and unconfined type of recreation" are supported and maintained.
2. The monument's prehistoric and historic archeological sites ("other features of value") are protected as fundamental monument resources and an essential quality of wilderness character. Most sites are influenced only by the cycles of natural processes. Human impacts that influence the condition of archeological sites are anticipated and minimized.
3. Administrative use of motorized vehicles, motorized equipment, and mechanical transport are rare within the Wupatki National Monument backcountry. Actions that may involve those uses are subject to the Minimum Requirements Analysis if proposed in eligible wilderness.

Zone-Based Desired Conditions

In addition to desired conditions that apply to all backcountry areas (above), this plan establishes desired conditions that apply to specific management zones that include backcountry lands (described in table 1 below). While the Extended Learning Zone is usually viewed as a “frontcountry” zone, in places it is transitional in nature, serving as a starting point for discovery hikes and other backcountry experiences. Therefore, this plan establishes desired conditions for this zone, as well as the Resource Preservation Zone and Discovery Zone. (See figures 3 and 4 for existing and proposed management zoning.)

Table 1. Zone-Based Desired Conditions

Category	Resource Preservation Zone	Guided Adventure Zone (proposed Discovery Zone)*	Extended Learning Zone
Desired Resource Condition or Character	<ul style="list-style-type: none"> Natural (physical or biological) resources run their life cycle with minimal intervention. With the exception of minimal preservation techniques to prevent loss of essential materials, cultural resources remain undisturbed by human interaction. The zone is predominantly natural, undeveloped, and untrammeled, preserving wilderness character. Fragile and unique resources are protected and species of concern thrive and flourish. The landscape provides habitat for local wildlife, such as pronghorn, golden eagle, prairie falcon, and Wupatki pocket mouse, and other native species sensitive to human land-use and habitat fragmentation impacts. Areas may serve critical scientific research needs for pronghorn and regional environmental change. This zone serves as a critical scientific research area for understanding Ancestral Puebloan settlement and subsistence patterns as well as cultural/social interactions and development. 	<ul style="list-style-type: none"> Natural (physical or biological) resources run their life cycle with minimal human intervention. In addition to minimal preservation techniques to prevent loss of essential materials, cultural resources will be managed to allow human impacts at acceptable levels that do not diminish condition or integrity. The zone is predominantly natural, undeveloped, and untrammeled, preserving wilderness character, but the sights and sounds of people can be present. Hiking routes are located in areas that emphasize public safety. Hikes are routed to highlight important natural and cultural resources and to minimize visitor impacts to those resources. 	<ul style="list-style-type: none"> Natural resources (physical or biological) run their life cycle with moderate NPS intervention. Some cultural resources and archeological sites may be hardened. The zone is developed to facilitate visitor access. Cultural resources are the predominant attraction. Sights and sounds of people and motor vehicles can be present. Hiking trails or routes and interpretive media are in areas that ensure public education, resource protection, and public safety.
Visitor Experience	<ul style="list-style-type: none"> This zone does not support public use/access. Use is only permitted for approved research and tribal uses. The probability of any permitted researchers or tribal members 	<ul style="list-style-type: none"> Visitors experience recreation in a natural setting that reflects all wilderness values, including a natural and undeveloped landscape, and opportunities for solitude and unconfined recreation. 	<ul style="list-style-type: none"> Visitors have the opportunity to explore and better understand monument resources through a self-guided or facilitated experience. This zone includes development such as trails, waysides, and

Category	Resource Preservation Zone	Guided Adventure Zone (proposed Discovery Zone)*	Extended Learning Zone
	encountering NPS staff or other evidence of NPS management is moderate to low.	<ul style="list-style-type: none"> • The undeveloped terrain conveys wilderness values through sensory experiences such as encountering natural sounds, dark night skies, olfactory sensations, and a sense of remoteness. • Visitors attain a sense of the past through encounters with prehistoric and historic structures, cultural landscapes, rock writings, and other archeological sites scattered throughout the backcountry, depicting the lives and cultures of the people who made Wupatki National Monument home. • Visitors are provided with the opportunity to experience viewscapes of desert grasslands, mesas, buttes, the Painted Desert, San Francisco Peaks, and volcanic hills. • Discovery hikes provide visitors with interpretation of monument resources, are from moderate to strenuous difficulty, and require a moderate time commitment. The need for individual outdoor skills and self-reliance varies, providing some visitors with opportunities to engage those skills, and others with more facilitated experiences, requiring low to moderate outdoor skills. • Opportunities for solitude range from low to high. • The probability of encountering other visitors, groups, or evidence of visitor impacts is low. The probability of encountering NPS staff and other evidence of NPS management activities, including routine backcountry patrols is moderate to high. 	<p>other infrastructure to support resource protection, visitor safety, and education around resources.</p> <ul style="list-style-type: none"> • Visitors attain a sense of the past through encounters with and interpretation of awe-inspiring prehistoric and historic structures, cultural landscapes, and rock writings, which depict the lives and cultures of the people who have made Wupatki National Monument home. • Direct connection to resources without undue resource impacts is a key element of this experience. • Paths and trails are short, easy to moderate, and, to the extent possible, accessible to people of all abilities. Visitors must allow at least a moderate time commitment, though the need for individual outdoor skills is low. • Opportunities for solitude are low. At certain times of the day or season, there are opportunities for solitude, but in general there is a moderate probability of encountering other visitors. • The probability of encountering other groups or NPS staff and evidence of visitor impacts is moderate to high.
Appropriate Visitor Activities, Services, or Facilities	<ul style="list-style-type: none"> • No visitor facilities or other developments are appropriate in this zone. • No visitor activities are appropriate in this zone. • Only permitted uses by researchers and tribal members 	<ul style="list-style-type: none"> • These areas are mostly free of trails and other developments in order to preserve viewsheds and the wilderness experience. No permanent facilities are present, except for primitive hiking routes and minimal signage or markers as 	<ul style="list-style-type: none"> • Interpretive media, restrooms, and small picnic areas can be present in this zone (near the road and car pullouts). All developments and uses are harmonious with the natural and historic character of the monument.

Category	Resource Preservation Zone	Guided Adventure Zone (proposed Discovery Zone)*	Extended Learning Zone
	<p>or other NPS-sanctioned uses are allowed in this zone.</p> <ul style="list-style-type: none"> • Protection of monument resources from visitor impacts is the priority for this area. 	<p>necessary for resource protection and visitor safety.</p> <ul style="list-style-type: none"> • Hiking and guided overnight experiences are the predominant activities in these areas. • Low level and low impact visitor use is encouraged to minimize damage to sensitive resources. 	<ul style="list-style-type: none"> • Viewing resources and attending interpretive walks and talks are the predominant activities in these areas. • Moderate to high visitor use is appropriate in these areas and management actions are undertaken to minimize resource impacts.

*Note: The Discovery Zone was identified in the 2004 GMP as the Guided Adventure Zone. The boundaries of this management zone were adjusted through a categorical exclusion completed in 2020. If this plan is approved, the zone would be renamed the Discovery Zone, with additional modifications to the boundaries.

RELATIONSHIP TO OTHER NPS PLANNING PROJECTS

This document is part of Wupatki National Monument’s planning portfolio. A park planning portfolio is the collection of planning documents that guides decision making and satisfies law and policy. The Wupatki National Monument planning portfolio creates a logical, trackable guide for park management actions. This backcountry management plan and GMP amendment addresses visitor use, management zoning, and the protection of wilderness character and cultural resources within the backcountry, including the Wupatki eligible wilderness. Other documents within Wupatki National Monument’s planning portfolio directly related to this planning effort are briefly described in appendix A.

The National Parks and Recreation Act of 1978 (54 USC 100502) requires the preparation and timely revision of general management plans for each unit of the national park system. Pursuant to Director’s Order 2: *Park Planning* (DO-2), each park must have a plan or series of plans that address the following four statutory requirements identified in 54 USC 100502:

1. measures for the preservation of the area’s resources;
2. indications of types and general intensities of development (including visitor circulation and transportation patterns, systems, and modes) associated with public enjoyment and use of the area, including general locations, timing of implementation, and anticipated costs;
3. identification of an implementation commitment for visitor carrying capacities for all areas of the unit; and
4. indications of potential modifications to the external boundaries of the unit and the reasons therefore.

This backcountry management plan fulfills a park planning priority for long-term direction related to resource preservation and visitor access in the Wupatki eligible wilderness and other backcountry lands within the monument. This plan is consistent with the general guidance of the 2004 GMP and 2017 wilderness character narrative and baseline monitoring assessment and helps the monument to better meet the general management plan statutory requirements of 54 USC 100502 and policy requirements of DO-2, specifically the requirement to address visitor carrying capacities and identify measures for preservation of the monument’s resources.

CHAPTER 2: ALTERNATIVES

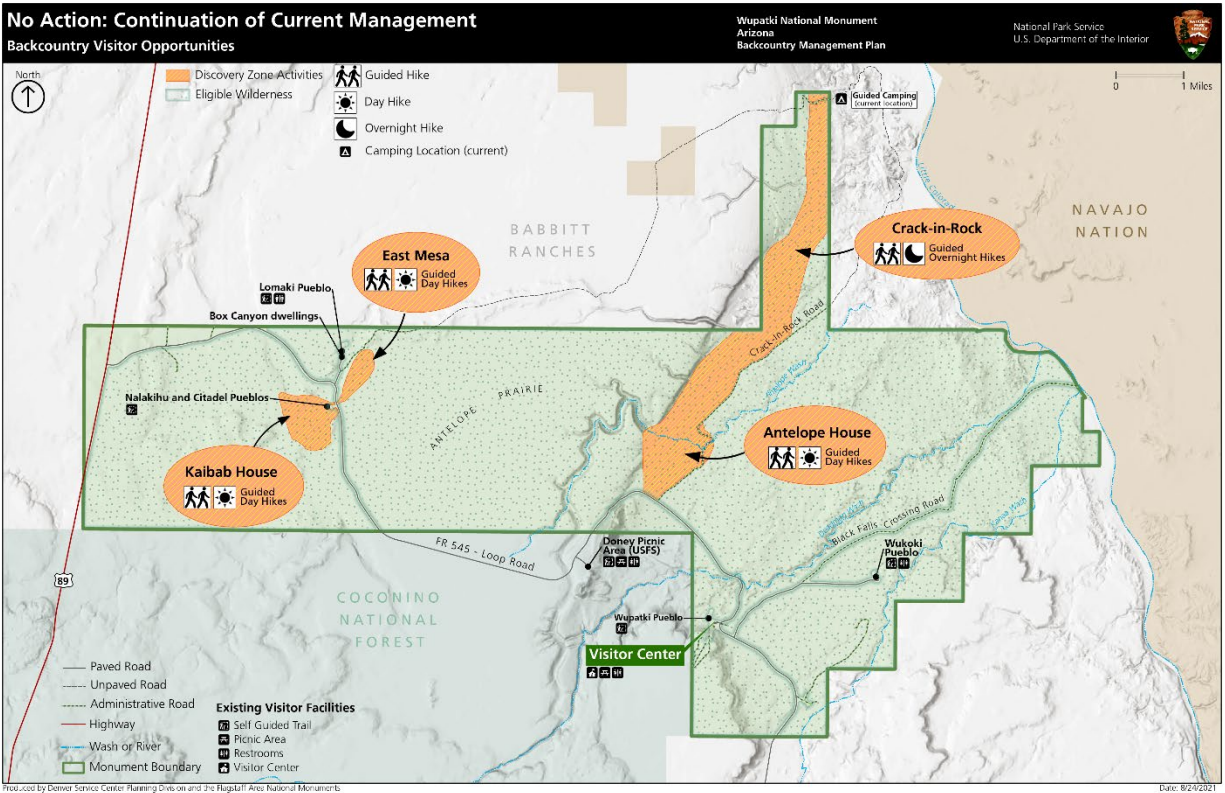
INTRODUCTION

Established planning documents (e.g., GMP) and the desired conditions developed as part of this planning effort provide direction regarding the overall character of resource conditions and visitor experiences at the monument. The purpose and need for this planning effort were developed through review of the monument's previous planning documents, input from a wide variety of NPS staff, and careful analysis of comments received during civic engagement efforts and tribal consultation that were conducted as part of this planning process. Once the purpose and need had been articulated, the National Park Service considered a range of visitor opportunities and management strategies to meet the purpose and need and achieve desired conditions. Feedback was received from the public, interested parties, and tribal nations related to the level of park development, impacts from unguided visitor access, and protection of natural and cultural resources. These comments helped the National Park Service understand values and preferences regarding visitor experiences in the monument and concerns, issues, and suggestions for future visitor opportunities in the backcountry.

This backcountry management plan/GMP amendment and environmental assessment analyzes current backcountry management (no-action alternative) and a proposed action (preferred alternative). The no-action alternative would continue current management direction as outlined in the 2004 general management plan, with minor modifications to the GMP management zoning that were formalized through a categorical exclusion process in 2020. The analysis of this alternative provides a basis for comparing what would happen to the environment if current management were to continue versus what would happen if the proposed action is implemented. The proposed action addresses the plan's purpose and need as described in chapter 1 and is based on recommendations of an interdisciplinary planning team, environmental impact analysis, and feedback received during outreach and consultation.

SUMMARY OF CURRENT MANAGEMENT (NO-ACTION ALTERNATIVE)

Under the no-action alternative, the monument would continue to offer the existing NPS-guided backcountry hiking opportunities through the popular Discovery Hikes Program. Discovery hikes are offered seasonally—as NPS staffing levels allow—and range from guided half-day hikes to an overnight program at Crack-In-Rock, which is accessed by a longer, more strenuous hike. In accordance with the 2004 general management plan, the National Park Service would pursue a permanent backcountry closure. Figure 2 depicts current visitor opportunities in the monument's backcountry, including eligible wilderness.



**Figure 2. No-Action Alternative: Continuation of Current Management
 Backcountry Visitor Opportunities**

Management Zoning

Current management zoning for Wupatki National Monument reflects the GMP management zoning scheme as modified in 2020. Figure 3 illustrates the existing management zoning that would continue under current management. The zoning scheme established in the 2004 GMP and minor zoning revisions completed by categorical exclusions prior to this planning effort are described in appendix B.

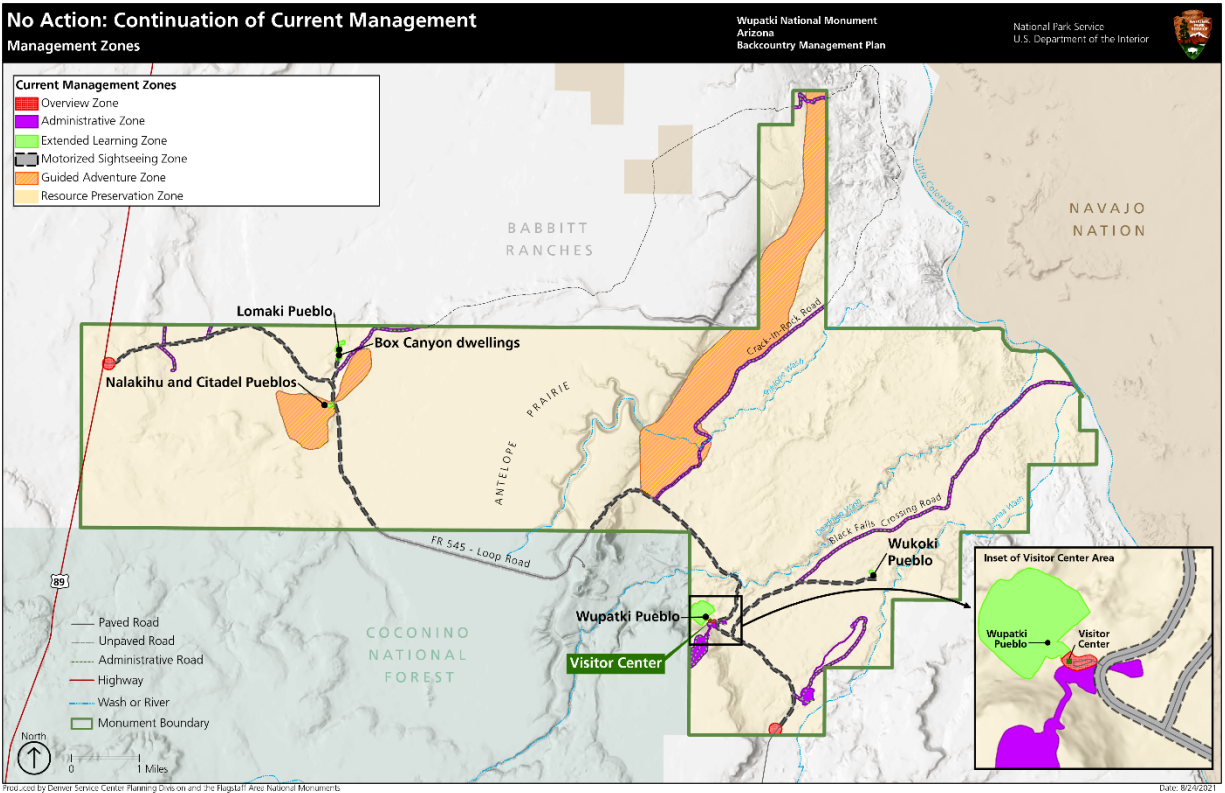


Figure 3. Existing Management Zoning for Wupatki National Monument (No-Action Alternative)

Guided Day Hiking Opportunities

Under the no-action alternative, the National Park Service would continue to provide public access to areas of the Wupatki eligible wilderness through the existing Discovery Hikes Program. These NPS-led hikes have been historically scheduled for weekends between October and April when monument staff capacity allows. There would not be opportunities for hikes led by non-NPS guides managed through commercial use authorities.

The National Park Service would continue to offer guided half-day hikes on three established routes (refer to figure 2):

- **Kaibab House.** The Kaibab House route begins at the Citadel and Nalakihi parking lot and travels south to highlight pueblo architecture, petroglyphs, and grasslands.
- **East Mesa.** The East Mesa route begins at the at the Citadel and Nalakihi parking lot and travels north to highlight pueblo architecture, petroglyphs, and grassland fire ecology.
- **Antelope House.** The Antelope House route begins on the Crack-In-Rock Road and highlights pueblo architecture, historic ranching camps, and red rock geology found in the central section of the monument.

While each hike would continue to follow a general route within the established Guided Adventure Zone, as amended in the 2020 categorical exclusion, there would be no designated trails. All current routes would be considered moderate difficulty due to the rocky surfaces and hilly terrain. Cross-country travel would continue and would allow guides to disperse impacts and limit development of trails or facilities in the Wupatki eligible wilderness.

To preserve the cultural and natural resources along the existing discovery hike routes, group sizes would continue to be limited to 15 people (up to 13 visitors and two NPS guides), and hikers would be required to conscientiously follow Leave No Trace principles.

Unguided Day Hiking Opportunities (N.A.)

Under the no-action alternative, unguided visitor opportunities would not be available in the Wupatki eligible wilderness or other areas of the backcountry. Short, hardened trails from visitor facilities to select pueblos would continue to be maintained in the frontcountry portion of the monument. Visitors interested in camping or backcountry hiking would be directed to the NPS-led guided day and overnight hiking experiences and would also continue to be directed to other public lands in the Flagstaff area.

Guided Overnight Opportunities

The popular overnight Crack-In-Rock Discovery Hike would continue to provide visitors with opportunities to enjoy the backcountry through a more extensive, challenging experience. This guided hike is a strenuous, 14- to 16-mile roundtrip backpacking trip deep into the monument's eligible wilderness. After traveling cross-country over rough desert terrain, participants would camp on the neighboring Babbitt Ranches – CO Bar Ranch (Babbitt Ranches) before heading back through NPS property to their designated start-and-end point. This hike would continue to be offered over weekends in April and October if/when NPS staffing levels allow. Visitors interested in participating in the Crack-In-Rock Discovery Hike would submit a request through an established system to be added to an interest list for the next scheduled hike.

Managed Access and Visitor Education

Managed access includes strategies that manage when, how, and how many visitors can use an area and include permits, reservations, and lotteries. Unguided backcountry visitor opportunities would not be allowed at Wupatki National Monument. Reservations would be required for all guided discovery hikes and would be made by contacting staff through an established system. Discovery hike participants would continue to receive an onsite orientation and safety briefing from NPS staff before embarking on guided hikes. NPS guides would provide informal interpretation throughout the experience.

NPS PROPOSED ACTION (PREFERRED ALTERNATIVE)

Under the NPS preferred alternative, the National Park Service would provide expanded day-use visitor opportunities in the monument's backcountry that connect to interpretive themes and emphasize natural and cultural resources protection. The expanded guided hiking program would provide additional opportunities for members of the public to experience the Wupatki eligible wilderness and learn about resources through interpretive programming. Additionally, the National Park Service would consider offering new opportunities for unguided day-use hiking, as well as potential for a new guided overnight experience. Management zoning descriptions and boundaries would be updated to accommodate the expanded guided hikes and new unguided hiking routes (updated management zoning described below). In addition, the National Park Service would pursue making the current backcountry closure permanent to provide the highest level of resource protection for in situ cultural resources and natural resources. The NPS preferred alternative is described in more detail below.

Management Zoning

Under the proposed action, management zone boundaries would be revised to reflect proposed new and expanded visitor uses in areas of the backcountry and eligible wilderness.

Figure 4 depicts the proposed management zoning updates under the proposed action. Changes include:

- The Discovery Zone would be expanded to allow for new visitor use (guided and potentially unguided) in new areas of the monument—i.e., Pronghorn Plateau, Hulls Canyon, and other areas to the south and west of Citadel.
- Overall, the Resource Preservation Zone would be reduced in size to allow for the above expansions to the Discovery Zone.

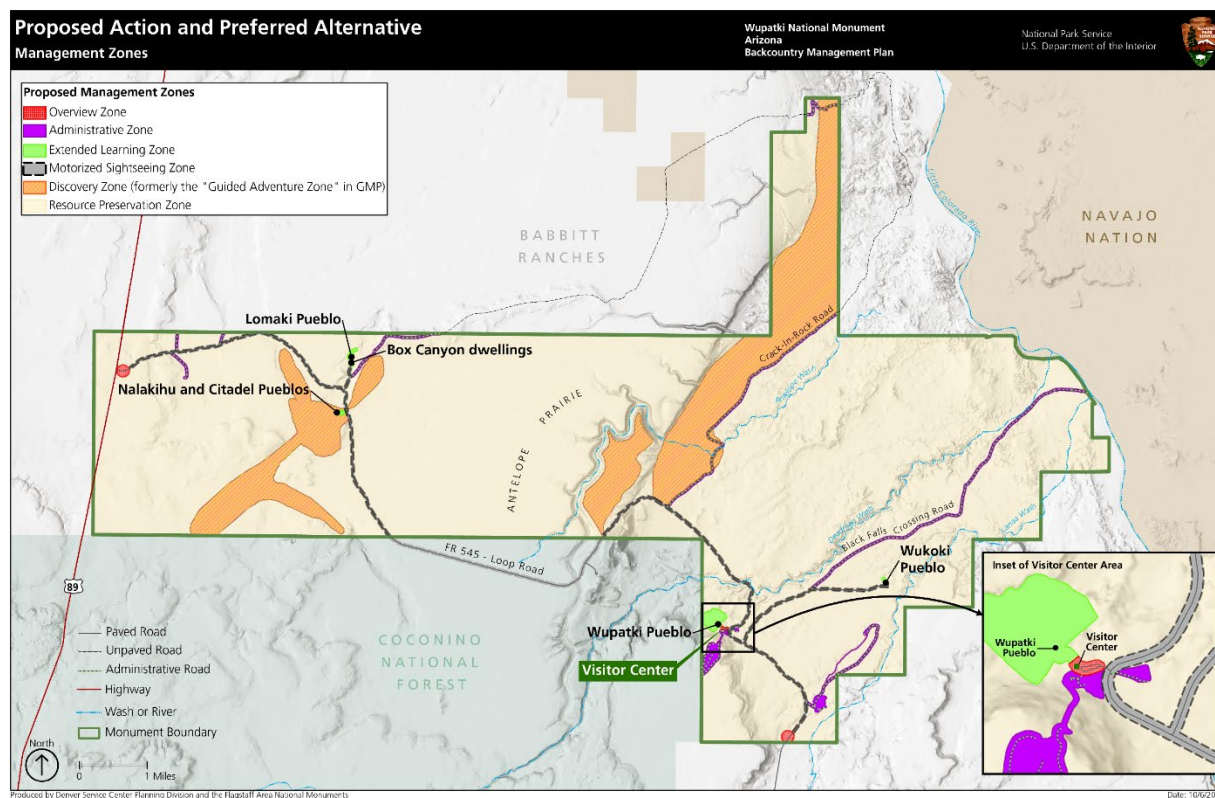


Figure 4. Proposed Management Zoning (NPS Preferred Alternative)

Updated Management Zone Descriptions. In addition to the proposed revisions to geographic boundaries, management zone descriptions would also be revised to address preservation of wilderness character and incorporate updated desired conditions prepared as part of this planning effort (chapter 1). If this plan is approved, these changes to zone boundaries and descriptions would represent an amendment to the general management plan.

While the 2020 categorical exclusion adjusted the *boundaries* of certain management zones and made other small modifications, it did not amend the narrative *descriptions* of management zones established in the 2004 GMP. The following updated zone descriptions address the preservation of wilderness character and align with newly established desired conditions for backcountry zones.

Resource Preservation Zone — Lands in the Resource Preservation Zone are managed to provide maximum preservation of fragile and/or unique resources, species of concern, traditional cultural landscapes, and other natural and cultural resources. In terms of total acreage, this management zone is the largest in the monument and includes natural and cultural features that contribute to the scenic diversity of the monument. Management action is dependent on resource needs, but natural processes are emphasized and left uninterrupted as much as possible. Resources include desert landscapes and ecosystems that provide habitat for diverse flora and fauna, as well as prehistoric and historic archeological sites and resources with continued cultural/ethnographic importance. NPS management activities include cultural resource preservation, resource inventory and monitoring, cooperative research, wildland fire management, and resource protection patrols. The vast majority of lands in this zone (approx. 29,810 acres) are eligible wilderness; thus, the preservation of wilderness values and character is emphasized, and management activities that have the potential to affect wilderness character must be consistent with the minimum requirement concept described in *NPS Management Policies 2006* (6.3.5). Lands identified as eligible wilderness are managed as wilderness in accordance *NPS Management Policies 2006* and Director's Order 41 for wilderness stewardship. The lands and resources in this zone are managed to preserve and protect wilderness values and resources, such as scenic views, wildlife habitat, natural systems, solitude, and cultural resources (other features of value).

Extended Learning Zone — The Extended Learning Zone includes visitor service areas and developed sites that support frequent and/or high levels of visitation. It is intensively managed to ensure resource protection and public safety, and resources could be modified for essential visitor needs (e.g., trails or interpretive media) and monument operations (e.g., hardening of archeological sites). Any changes to resources or facilities would be done in a way that harmonizes with the natural and cultural environment. The emphasis in this zone is for visitors to learn about, experience, and connect with significant monument resources. Predominant activities include viewing resources and attending interpretive walks and talks. Experiences in this area are either self-guided or ranger-led, and while structure and direction are provided (e.g., trails, interpretive media, signs), some opportunity for discovery is available. Facilities and services in this zone are typically formal and accessible, though some may be unimproved, but defined to support more formal recreation experiences.

*Discovery Zone (formerly Guided Adventure Zone)*¹ — Lands in the Discovery Zone are managed for the conservation of natural and cultural resources and to provide visitor opportunities to experience the backcountry and eligible wilderness. This zone includes natural and cultural features that contribute to the scenic diversity and value of the monument. The vast majority of lands in this zone (approx. 4,030 acres) are eligible wilderness; thus, the preservation of wilderness values and character is emphasized, and management activities that have the potential to affect wilderness character must be consistent with the minimum requirement concept described in *NPS Management Policies 2006* (6.3.5). Lands identified as eligible wilderness are managed as wilderness in accordance with *NPS Management Policies 2006* and Director's Order 41 for wilderness stewardship. The lands and resources in this zone are managed to preserve and protect the values of wilderness such as scenic views, wildlife habitats, natural systems, solitude, and cultural resources (other features of value). Tolerance for resource degradation in this zone is low. Management activities that have the

1. The Discovery Zone was identified in the 2004 GMP as the Guided Adventure Zone. The boundaries of this management zone were adjusted through a categorical exclusion completed in 2020. If this plan is approved, the zone would be renamed the Discovery Zone, with additional modifications to the boundaries.

potential to affect wilderness character must be consistent with the minimum requirement concept described in *NPS Management Policies 2006* (6.3.5). There is no modern infrastructure such as trails or other facilities, but minimal signage and markers to support wayfinding and visitor safety may be appropriate in some locations. These would be designed to harmonize with the environment and not be visually intrusive. Access to this zone, including recreational uses such as hiking, wildlife and night sky viewing, and overnight camping as part of an NPS-led program, as well as research and traditional cultural activities, requires either a guide or a permit. The probability of encountering other groups is low, and there are some opportunities for individual solitude. Resource protection and visitor safety are primary management goals for this zone; thus visitor access would occur only seasonally to ensure there is no disruption to natural behaviors among species such as pronghorn antelope or raptors and to avoid monsoon season and unsafe temperatures. Additionally, monitoring of resources would be conducted regularly based on established indicators and thresholds.

Overview Zone — The Overview Zone includes areas where visitors are provided an overview of monument resources and significance with minimal physical exertion such as the visitor center area and waysides at the monument's two main entrances. Resources would appear natural, but some areas may be paved to protect resources or other management actions taken as necessary. Visitors interact with resources only to the extent possible without undue impact to those resources. Orientation and interpretation of primary monument themes would be important elements of this experience. Interaction and encounters with other visitors and monument staff would be common, but overcrowding would be avoided. Although structured, intimacy with some resources could be possible, viewing resources from a distance or from a trail or overlook facilities would be more common. Sightseeing, learning about the monument, short walks, and attending interpretive programs would be common activities in these areas. Orientation and interpretation facilities, such as kiosks, wayside exhibits, and other interpretive media, would be appropriate. Support facilities such as rest rooms, trash and recycling receptacles, and picnic facilities could also be present.

Administrative Zone — Areas and roads zoned as administrative are for NPS use and not intended for visitors. These areas include development to support monument operations and are located away from sensitive natural or cultural resources. The natural environment would be modified for monument operation needs, but they would be changed in a way that harmonizes with the surrounding environment. Facilities necessary for monument operations or surrounding land uses are appropriate in this zone, including monument maintenance yards, residential areas, access roads, and utility areas and corridors. The Black Falls Crossing Road, which provides access to the neighboring Navajo Nation, is included in this zone because it is not intended to provide experiences for park visitors.

Motorized Sightseeing Zone — The Motorized Sightseeing Zone is a developed area that includes paved roadways and associated developments that visitors use for touring the monument, enjoying scenery, and gaining access to other areas. Intensive management would be provided in this area to ensure resource protection and public safety (e.g., fences, law enforcement, and restriction on visitor activities). Resources might be modified (e.g., paving or felling hazard trees) for essential visitor and monument operational needs. The visitor attractions would be convenient and easily accessible. The visitor experience would be generally dependent on a vehicle or bicycle and would involve traveling along a well-maintained, paved road. Observing the natural environment would be important, and there would be a sense of adventure but little need for visitors to exert themselves or apply outdoor skills. The probability of encountering other visitors would be high, and there would be a moderate probability of encountering NPS staff. Facilities include paved roads, pullouts, overlooks, short trails,

picnic areas, parking areas, and other facilities that support visitor touring. Most facilities and portions of most trailheads or sidewalks in this area would be accessible to people of all abilities, including those with limited mobility.

Summary of Proposed Changes to Zoning. Table 2 compares current zoning and proposed management zoning. Acreage is an approximation from available geospatial data, rounded to the nearest whole number. Note that the amount of wilderness within each management zone is subject to change as the monument moves through the wilderness identification and designation process described in Section 6.2 of *NPS Management Policies 2006*.

Table 2. Current and Proposed Management Zoning

Current Management Zoning: No Action	Proposed Future Management Zoning: NPS Proposed Action and Preferred Alternative
Resource Preservation Zone 31,859 acres (approx. 31,245 acres eligible wilderness)	Resource Preservation Zone 30,419 acres (approx. 29,810 acres eligible wilderness)
Guided Adventure Zone 2,598 acres (approx. 2,598 acres eligible wilderness)	Discovery Zone 4,034 acres (approx. 4,030 acres eligible wilderness)
Extended Learning Zone 70 acres (approx. 47 acres eligible wilderness)	Extended Learning Zone 71 acres (approx. 48 acres eligible wilderness)
Administrative Zone 454 acres (approx. 290 acres eligible wilderness)	Administrative Zone 454 acres (approx. 290 acres eligible wilderness)
Overview Zone 34 acres (approx. 18 acres eligible wilderness)	Overview Zone 37 acres (approx. 19 acres eligible wilderness)
Motorized Sightseeing Zone 360 acres (0 acres eligible wilderness)	Motorized Sightseeing Zone 360 acres (0 acres eligible wilderness)

Guided Day Hiking Opportunities

The NPS preferred alternative would expand the frequency and locations of guided hikes in the backcountry and emphasize interpretation of monument resources to allow more visitors the opportunity to participate in a guided backcountry experience. The monument would continue to offer discovery hikes to East Mesa, Kaibab House, and Antelope House. The Kaibab House Discovery Hike Area would be expanded to include additional eligible wilderness areas around Hulls Canyon that could support a new or expanded discovery hike route. A minimum requirement analysis (MRA) and additional environmental compliance would be completed, as appropriate, for additional proposed administrative actions as required in accordance with NPS management policies guiding wilderness stewardship.

Discovery hikes would continue to be offered between October and April if/when staffing allows with updated closures to accommodate raptor nesting, pronghorn migration and calving, and visitor safety during the hottest months of the year. Seasonal access for the discovery hikes is summarized in the visitor capacity and implementation section (table 4). The locations and frequencies of specific discovery hike offerings would be flexible, allowing resource managers to respond to resource needs and guides to provide the best visitor experience possible.

To provide an enhanced and expanded guided Discovery Hikes Program, monument staff would evaluate current NPS capacity to guide additional discovery hikes. To increase the frequency of discovery hikes, the monument could redirect staff capacity—where possible—to provide more visitor opportunities and could pursue funding opportunities for seasonal or intern NPS positions that could serve as additional guides. The monument could also explore cost recovery methods from discovery hike participant fees to support hiring additional NPS guides and expanding the program if/when staffing capacity allows.

In addition, the National Park Service could identify and consider partner organizations that could act as guides for the discovery hikes. Preferred partners would emphasize education and interpretation and include groups such as nonprofits, volunteer organizations, other land management agencies, local universities or other educational organizations, and tribal members. Monument staff would update and adjust the discovery hikes standard operating procedures and other program guidance to provide opportunities for new and potential partners that support the mission of the National Park Service and Wupatki National Monument. Guidance would identify interpretive themes and practices that emphasize wilderness values.

Commercial entities that support the mission of the National Park Service and Wupatki National Monument and emphasize interpretive themes and wilderness values may be considered for future partnerships. Any future backcountry commercial use proposals would be individually evaluated under an Extent Necessary Determination and minimum requirements analysis, as required by NPS management policies, and subject to additional environmental compliance as appropriate. See appendix G for additional criteria for determining appropriate visitor activities and opportunities in the backcountry portion of the monument.

All guides, regardless of their status as NPS employee, partner, or commercial entity, would complete required training on the monument's interpretive themes, Leave No Trace principles, visitor safety, wilderness stewardship, and other key information from NPS staff on an ongoing and regular basis.

Discovery hike guides and other monument staff would continue to monitor impacts to resources from visitors during discovery hikes. Monitoring would focus on the indicators and thresholds established under this plan. If impacts to resource surpass established triggers and/or thresholds, management actions would be in place to address them, which could include, if necessary, temporary or permanent area closures.

Unguided Day Hiking Opportunities

The preferred alternative would allow the monument to consider new opportunities for visitors to experience the eligible wilderness through unguided hiking opportunities. Under a phased management approach, the monument would offer limited unguided hiking permits for designated areas within the Discovery Zone.

As with the guided discovery hike areas, staff would monitor resource impacts in the unguided hiking routes. If impacts to resources surpass established triggers and/or thresholds, management actions would be put in place to address them, which could include converting an opportunity for unguided hiking to a *guided* hiking opportunity or closing that area to public access (see appendix C for full descriptions of indicators and thresholds). Unguided hiking access could also be adjusted to guided hiking if the National Park Service deems it necessary to provide for adequate resource protection and/or the best possible visitor experience. Reasons for such an adjustment may include: demand for guided interpretation of the area, visitor impacts to resources, exceeding triggers and/or thresholds related to desired conditions, or concern for visitor safety.

New Hiking Areas. Under the preferred alternative, the National Park Service could allow unguided hiking in two areas of the backcountry to provide opportunities for individuals to experience solitude and primitive recreation at Wupatki National Monument:

- **Kaibab Crossing.** This route would connect Coconino National Forest and the developed frontcountry trail at Wupatki Pueblo. Visitors would be able to start either at the US Forest Service (USFS) Doney Picnic Area or Wupatki Pueblo. The area's topography and clear sightlines would provide an easy to follow yet moderately challenging route that would pass through stunning and unique views of Wupatki Pueblo and the San Francisco Peaks. The majority of this route would follow an existing two-track road on USFS property; unguided hiking is an allowed use on USFS land. The 0.3 miles of route occurring within the NPS boundary would be delineated, in places, to promote visitor safety and resource protection.
- **Pronghorn Plateau.** Pronghorn Plateau is an elevated area, surrounded on three sides by Antelope Canyon and the Doney Cliffs, two prominent landforms. Visitors to the Pronghorn Plateau area would start and end their experience at the USFS Doney Picnic Area and cross into the Wupatki eligible wilderness. A self-guided hike following the natural plateau boundary would provide access to tremendous scenic vistas across Wupatki National Monument, opportunities for wildlife viewing, and a wilderness experience. It would be about a 5-mile hike for visitors who choose to make a loop along the edge of the plateau. This hike would be moderately challenging with cross-country walking through cinder soil.

Supporting Infrastructure — The existing Doney Picnic Area on USFS land would serve as a starting point for both hikes, and the Wupatki National Monument Visitor Center would provide additional support to the eastern section of the Kaibab Crossing Route. This would allow day-use hikers to use existing visitor facilities including parking lot and toilets at USFS Doney Picnic Area and the amenities available at the monument visitor center.

- **Signage.** Additional orientation infrastructure and signage would be added to inform visitors that the unguided access requires a permit and to communicate to visitors the importance of wilderness stewardship. Minimal signs, markers, and delineation methods would be used to achieve desired conditions. Development and management of trail signs would be consistent with guidance provided in Recreation Opportunity Spectrum (ROS; PL 93-378, as amended) pertaining to the appropriate use of materials, markers, spatial arrangement, and directional messaging that are relative to a given zone of recreational use (resource preservation, extended learning, discovery, wilderness/eligible wilderness). Any signage or other markers on NPS land along the routes would be minimal, designed to harmonize with the surrounding landscape, and used only as necessary to protect wilderness resources or support visitor safety, such as those identifying routes and distances, per *NPS Management*

Policies 2006 6.3.10.4. Unguided hikers would be encouraged to use maps for wayfinding, thus reducing reliance on directional signage. Installation of signs, signposts, or other elements that require ground disturbance would be completed in accordance with all applicable regulations and compliance requirements, including minimum requirement analysis under NPS management policies.

- **Routes.** To preserve the natural landscape, new trails would not be constructed in the backcountry—most of which is eligible wilderness. Instead, public access to the backcountry would be by way of designated routes or areas. In places, primitive routes would be delineated where necessary to provide additional navigation and to protect sensitive and fragile resources, including soil crust, vegetation, and cultural resources. For Kaibab Crossing, the route would follow an existing two-track roadbed before crossing a wash and ending near Wupatki Pueblo. Constructed features and trail elements would be minimal. The monument would use native materials to delineate the route boundary and protect resources where necessary, for example where the route crosses the wash. In certain areas where route delineation using native materials is not possible, monument staff may consider other options such as carsonite posts. The installation of pedestrian gaps or latch gates to allow visitors to pass through sections of fencing along the proposed unguided hiking routes would also be considered, if necessary.

All actions associated with wayfinding, infrastructure, and establishing hiking routes within the Wupatki eligible wilderness would be the subject to minimum requirement analysis under NPS management policies if determined necessary. The National Park Service would implement measures to reduce adverse effects of route development and/or maintenance on visitor safety, experiences, and resources, including wilderness character. For example, maintenance activities would be scheduled to minimize impacts on visitation and wildlife behavior (e.g., nesting seasons).

Guided Overnight Opportunities

Under the preferred alternative, the overnight Crack-In-Rock Discovery Hike would continue, with the monument considering ways to increase NPS capacity to staff this popular experience. The Pronghorn Plateau area, described above as an unguided hiking area, could also be offered as a guided overnight hike. This new route would provide a less strenuous, shorter hike option for visitors interested in experiencing the dark night sky and eligible wilderness at the monument without the physical requirements needed to complete a 14-16 mile backpacking trip. Frequency of guided overnight programs would be determined by NPS staff capacity and monitoring of resource conditions and indicators-thresholds along the route(s).

Visitor Education and Managed Access

Visitor education and managed access—that would include reservations or lotteries for guided hikes and permits for unguided use—of any backcountry experience would be paramount to provide for visitor safety and to protect invaluable resources that are widespread throughout the backcountry, including eligible wilderness. All individuals participating in activities in the backcountry would meet with NPS staff to complete a required orientation that covers: wilderness stewardship, significant or sensitive resources, Leave No Trace principles, wayfinding, and general conditions of the area, along

with any other necessary information. For those on guided discovery hikes, orientation information would be provided when reservations are made and during the first half hour of the hike.

Permits would be required for all unguided access in the backcountry, allowing groups of four individuals or fewer to hike together to maintain the wilderness experience. The number of permits for each hike would vary based on seasons and resource conditions/sensitivity. Those receiving a permit would also provide information to monument staff, including group size and license plate number. Permit distribution would require hikers to visit the visitor center during open hours to complete the onsite orientation process and provide necessary information.

A fair and efficient permitting process would be developed to manage visitor use in the backcountry and maintain the solitary and primitive experiences for hikers as well as protect sensitive resources in any given area. The method of providing permits could be adjusted as needed between paper permits, online reservation systems (e.g., recreation.gov), and other potential tools to create a process that is useful to visitors, flexible enough to support changing management capacities, and does not hinder park operations. Processes related to cancellations would be developed by monument staff.

Figure 5 depicts existing and proposed visitor opportunities in the monument's backcountry, including eligible wilderness, under the preferred alternative.

Proposed Visitor Use Management Actions

Under the preferred alternative, three indicators would be added to the monitoring program, and their related management strategies and visitor capacities for backcountry areas including eligible wilderness would be implemented in accordance with NPS *Management Policies* 2006 6.3.4.2 Wilderness Management Planning and 8.2.1 Visitor Carrying Capacity (see appendix A for information on the 2020 Flagstaff Area National Monuments Five-Year Strategic Monitoring).

Indicators and Thresholds for Visitor Use Monitoring Management. Indicators, thresholds, monitoring protocols, and management strategies specific to visitor use in the backcountry—including Wupatki eligible wilderness—are part of this backcountry management plan and GMP amendment. They have been developed to assist in achieving and maintaining the desired resource conditions and visitor experiences identified in chapter 1.

Indicators translate the desired conditions into measurable attributes (e.g., linear extent of visitor-created trails) that, when tracked over time, evaluate change in resource or experiential conditions from visitor use. These are critical components of monitoring the success of management actions and strategies. Thresholds represent the *minimum acceptable condition* for each indicator and were established by considering the desired conditions, data on existing conditions, relevant research studies, and professional judgment of staff from management experience. An additional monitoring tool is the use of triggers, which identify conditions of concern for an indicator enough to prompt a management response before any threshold is crossed. In more complex planning efforts in which there are particularly sensitive resources—such as the surface archeological resources found in Wupatki National Monument's backcountry—triggers may be established in addition to thresholds. Not all indicators require triggers. Full descriptions and rationale for these indicators, thresholds, and triggers, and definitions of other key terms, are included in appendix C.

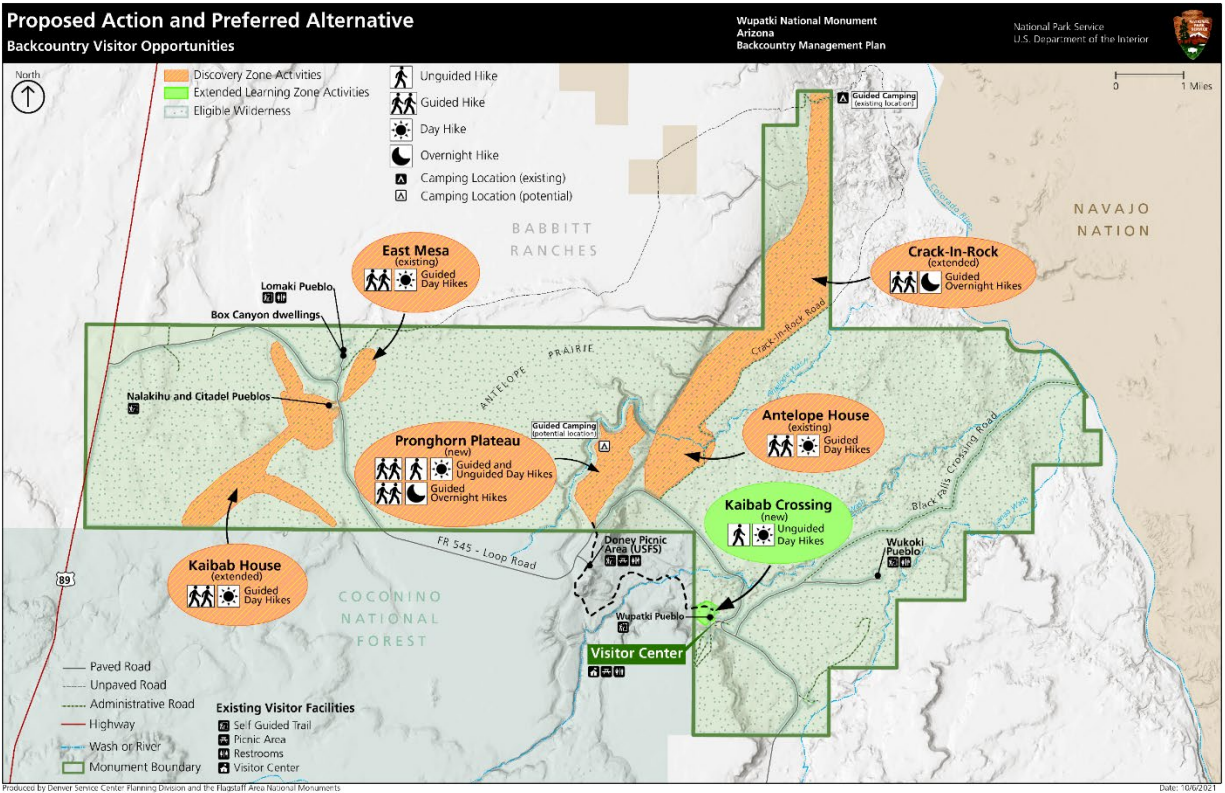


Figure 5. Preferred Alternative: Proposed Backcountry Visitor Opportunities

Monitoring is the process of routinely and systematically gathering data to assess the status of specific resource conditions and visitor experiences. Monitoring is an integral component of resource and visitor use management and allows managers to objectively and effectively evaluate whether desired conditions are being achieved and maintained. Monitoring also reveals how conditions change over time, including the rate and magnitude of change. Because of its mandate to preserve the resources within Wupatki National Monument, the National Park Service has a robust, ongoing monitoring program for its cultural and natural resources that is outlined in the monument's strategic monitoring plan (2020) and Discovery Hike standard operating procedures (2014). The visitor use indicators, thresholds, and monitoring protocols described below would be added to this monitoring program as part of the preferred alternative. Any monitoring on the Coconino National Forest section of the Kaibab Crossing route would be done in collaboration with the National Park Service and US Forest Service.

The following indicator topics have been selected for monitoring in the backcountry of Wupatki National Monument:

- Spatial extent of visitor-created trails
- Spatial extent of barren core areas (areas bare of vegetation)
- Artifact displacement

Each indicator is applied to the backcountry based on the following six different visitor use areas (described as “use areas” throughout this section):

- Crack-In-Rock Guided Overnight Discovery Hike Area
- Kaibab House Extended Guided Discovery Hike Area
- Antelope House Guided Discovery Hike Area
- East Mesa Guided Discovery Hike Area
- Pronghorn Plateau Discovery Hike Area
- Kaibab Crossing Discovery Hike Area (specifically focused on the portion located on NPS land)

Indicator Topic: Spatial Extent of Visitor-Created Trails —

Indicator: Linear feet of visitor-created trail per use area.

Threshold: No more than 16 linear feet of visitor-created trails *total* within each use area.

Monitoring: Primary monitoring would occur throughout the discovery hike season as each guide completes a post-hike report identifying the route taken, sites visited, and any observations. If areas of concern are identified, monument staff would do additional monitoring. Additionally, annual monitoring would occur in every hiking area. This would be completed by monument staff or volunteers walking along the general routes used for discovery hikes, throughout the hike area at Pronghorn Plateau, and the .3 miles of the Kaibab Crossing route within monument boundaries. Photographs taken by monument staff or volunteers of the site and a mapping grade (sub-meter positional accuracy) global navigation satellite system (GNSS) device could also be used to identify informal trail development, according to standardized and repeatable protocols developed by the FLAG GIS Specialist. Linear feet would be calculated using GIS software. The FLAG GIS Specialist would manage the visitor-created trail dataset to track current conditions and changes to inform management strategies.

Management Strategies:

- Manage group sizes for all backcountry access.
- Increase spatial dispersion of off-trail, cross-country hikers by discouraging single file where possible.
- Randomize routes, to the extent practicable, for the guided discovery hikes to reduce repeated impacts.
- Reroute hikes so visitors walk the contour along slopes rather than going directly down or up the slope.
- Allow areas to recover by rotating the use of guided discovery hike areas.
- Use abandoned two-track roads as hiking trails for access when present.
- Implement day-use and overnight-use (where applicable) permitting to manage amount and timing of unguided visitors' presence in the backcountry.
- Increase education and awareness of Leave No Trace principles.

- Develop key hike orientation messaging about the development and impacts of visitor-created trails as well as ways to minimize impacts in the backcountry to be delivered by discovery hike guides.
- Assess visitor-created trail(s) to determine possible reasons for establishment—e.g., does it lead to a desired vantage point or site? Based on results, consider adjusting hiking routes to direct visitors to appropriate areas where the desired experiences could be provided.
- Assess and document the fragility and vulnerability of resources being impacted where visitor-created trails are occurring. If a resource being impacted is determined to be an outstanding feature, take appropriate adaptive management actions such as seasonal site closures or permitting systems to manage the amount of use that occurs in the area.

Adaptive Management Strategies:

- Remove locations (specific sites or areas altogether) from the list of eligible guided discovery hike areas until efforts to stabilize and recover are successful. Over time, assess if and when the area or site may be reopened to visitation.

Indicator Topic: Spatial Extent of Barren Core Areas —

For Pronghorn Plateau

Indicator: Total area within Pronghorn Plateau with compacted soils, devoid of organic materials because of human use (i.e., barren core area).

For All Other Discovery Hike Areas

Indicator: Spatial extent of individual barren core areas.

For All Visitor Use Areas

Threshold: No single barren core area greater than 6 ft² within 50 feet of high visibility sites (e.g., Navajo hogans, prehistoric masonry structures, petroglyphs, sites with highly visible artifacts).

Monitoring: Primary monitoring would occur throughout the discovery hike season as each guide completes a post-hike report identifying the route taken, sites visited, and any observations. If areas of concern are identified, resource staff would be notified and additional monitoring would occur. Additionally, annual monitoring would occur in *every* hiking area to ensure all sites are monitored. Monitoring would be conducted by monument staff or volunteers who will photograph the site and use a mapping grade (sub-meter positional accuracy) (GNSS device to map the boundary of the barren core area as a polygon, according to standardized and repeatable protocols developed by the FLAG GIS Specialist. Site size will be calculated using GIS software. The FLAG GIS Specialist will manage the barren core area polygons in a dataset to track current conditions and changes to inform management strategies. This software should provide the spatial extent of the total area considered to be a barren core area.

For Pronghorn Plateau, the sum total amount of barren core area within the use area would be categorized by the following scale:

- 1: absent (<6 ft²);
- 2: 6-12ft²;
- 3: 13-31ft²;
- 4: >31ft²

Using this system accounts for some minimal variability in measuring among monitors, while still informing monitoring staff of any increases in barren core area approaching the threshold of level 4 or 31 ft².

For all other visitor use areas in the backcountry, where the size of the barren core area is being monitored in relation to its proximity to high visibility cultural resource sites, such as prehistoric masonry structures or Navajo hogans, GPS measurements would not be summed and any observable barren core area would be measured.

Timing for annual monitoring would be determined by resource specialists when it is easiest to detect and monitor changes in barren core areas.

Management Strategies:

- Manage the number and size of groups for all backcountry access.
- Designate specific camping areas where rotation could occur.
- Within the designated camping areas, require/encourage campers to spread out for all overnight use at Pronghorn Plateau to reduce impacts from repetitive use at any one location.
- Alternate which locations on the plateau are considered for designation as camping areas.
- Consider reroutes to avoid impacts to sensitive cultural resources and rotating where guided groups gather for interpretation of sites during guided discovery hikes.
- Alternate the use of discovery hike areas to allow resources to recover.
- Consider temporary area closures in response to rain events to reduce impacts to highly erodible soils and sensitive vegetation.
- Provide additional education to discovery hike guides about concerns over barren core areas and how to deter their establishment and/or expansion.

Adaptive Management Strategies:

- Alternate use areas until efforts to stabilize/recover are successful.
- Remove locations (specific sites or areas altogether) from the list of eligible guided discovery hike areas until efforts to stabilize and recover are successful. Over time, assess if and when the area or site may be reopened to visitation.
- Consider lowering group size numbers under the following conditions:
 - Immediately following a rain event to reduce impact on wet and erodible soils.
 - Where geographic constraints or other resource conditions would cause larger groups to disperse off trail, increasing the potential for expanded barren core area.

Indicator Topic: Artifact Displacement —

Indicator: Number of collection piles per visitor use area.

Threshold: Two collection piles per site over the course of a hiking season.

Trigger: One collection pile in any location in the backcountry.

Monitoring: Monitoring collection piles under this indicator would occur primarily at sites with high vulnerability due to visibility type(s) of cultural material present, and overall condition where visitation has occurred in the last 12 months (i.e., at least one discovery hike to the area occurred) and other areas as defined by the FLAG resource and interpretation staff. Baseline conditions would

be identified before the implementation of this plan. The monument would use current monitoring forms and note collection piles and locations with GIS. Additional monitoring would be done by archeologists, law enforcement, and volunteer site stewards. A comprehensive monitoring plan would be completed to support the implementation of unguided access.

The project team deemed that the use of a trigger for this indicator was vital because of the importance of the preservation of cultural resources per the monument's purpose and enabling legislation. The 1924 presidential proclamation states that "public interest would be promoted by reserving these prehistoric remains." Further, the 2015 foundation document explicitly outlines that the purpose of the monument is to "preserve and protect thousands of archeological sites scattered across the stunning landscape." Considering the sensitive nature of archeological resources and their direct connection to the monument's establishment and purpose, any evidence of artifact removal or movement is a problem that should be addressed. Thus, every newly recorded collection pile is cause for concern and would result in additional resource staff efforts to educate visitors and protect remaining in situ cultural resources. The trigger for this indicator would prompt a management response to ensure that desired conditions continue to be maintained before the threshold is crossed.

Adaptive Management Strategies when the Trigger is Met:

- Temporarily close locations (specific sites or areas altogether) to visitor use to allow for resource specialists to examine the area and analyze impacts. Document collection pile, then disperse it.
- Increase emphasis on orientation and education about Leave No Trace principles, the impacts to the resources and history from moving or collecting artifacts, and the responsibility of each visitor to protect the cultural resources in the backcountry.

Management Strategies:

- Manage group sizes for all backcountry access.
- Document and disperse collection piles when found.
- Increase education on the website and other digital media, as well as during the orientation and throughout the discovery hikes, about Leave No Trace principles and the impacts of moving or collecting artifacts.
- Require all visitors to the backcountry and eligible wilderness to review provided information on Leave No Trace principles and wilderness ethics prior to joining a discovery hike or obtaining a permit. This could be through mixed media (online video, brochure sent through mail, etc.).
- Conduct artifact inventories.
- For discovery hikes, increase the in-person, pre-hike orientation and education on Leave No Trace principles and wilderness ethics before embarking on the hike.
- Encourage alternating or selecting sites that vary by season.
- Reevaluate discovery hike standard operating procedures (SOPs) that direct how discovery hikes should be conducted as necessary related to use of artifacts in interpretation (e.g., picking them up to show visitors)

Adaptive Management Strategies:

- Remove locations (specific sites or areas altogether) from the list of eligible guided discovery hike areas until efforts to stabilize and recover are successful. Over time, assess if and when the area or site may be reopened to visitation.
- Access would be guided only, from formerly unguided and guided.

Visitor Capacity. Visitor capacity is a component of visitor use management defined as the maximum amount and types of visitor use that an area can accommodate while sustaining desired resource conditions and visitor experiences, consistent with the purpose for which the area was established. Visitor capacities inform management strategies that keep use levels within the identified number. This visitor capacity identification is also directed by legal mandate in the 1978 National Parks and Recreation Act, which requires that national parks address capacity in planning by defining capacities for all areas of the park unit. Identification of the visitor capacity includes analysis of the limiting attribute(s) that most constrain use, which for the Wupatki backcountry including eligible wilderness are generally the irreplaceable cultural resources, sensitive natural resources, and quality of the visitor experience. Because of the critical need to protect and preserve the monument's backcountry and Wupatki eligible wilderness, a detailed analysis to identify the appropriate level of use for all areas of the backcountry is included in appendix D.

For the backcountry and eligible wilderness, seven geographic analysis areas were identified and analyzed based on use type and management. These analysis zones are the same as the six visitor use areas discussed above, with one addition. To meet the statutory requirement for visitor capacity for all areas of the monument, the Resource Preservation Zone (which does not allow visitation) was identified as its own analysis area.

The seven analysis areas are:

1. Resource Preservation Zone (no visitor use)
2. Crack-In-Rock Guided Overnight Discovery Hike Area
3. Kaibab House and Kaibab House Extended Guided Discovery Hike Area
4. Antelope House Guided Discovery Hike Area
5. East Mesa Guided Discovery Hike Area
6. Pronghorn Plateau Discovery Hike Area
7. Kaibab Crossing Discovery Hike Area: Area within NPS boundaries

Seasonal Closures — All backcountry areas with visitor use have seasonal closures related to natural resource protection and visitor safety (see table 3). These seasonal closures protect pronghorn movement corridors, pronghorn calving habitats, and rare/sensitive raptor nesting cliffs from impacts due to visitor presence. Visitor safety is a limiting attribute because of the extreme conditions that can occur in the backcountry: during the summer months temperatures can be exceedingly hot, and the late summer monsoon season brings high humidity, lightning storms, and flash flooding. The protection of cultural resources does not vary seasonally and is a priority in each analysis area year-round. Table 3 specifies the timing for when each analysis area is open or closed to visitor use and summarizes the rationale.

Table 3. Seasons for Access in Analysis Areas with Visitor Use

Analysis Area	Open Season	Closed Season (Visitor Capacity is 0)	Rationale for Closure
2. Crack-In-Rock Guided Overnight Discovery Hike Area	Months of October and April	November 1 – March 31 May 1 – September 30	Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
3. Kaibab House Guided Discovery Hike Area	October 1– June 30 Extended Areas is open October 1 to December 31	July 1 – September 31 Extended area closed Jan 1 – September 31	Pronghorn movement and calving season in the Halls Canyon, Ballcourt Wash, and Cedar Canyon areas during the winter and spring. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
4. Antelope House Guided Discovery Hike Area	November 1 – March 31	April 1 – October 31 Seasonal buffer closure from December 1 and July 31 as needed	Pronghorn movement. Seasonal nest cliff buffer closure for rare/sensitive raptors, from initiation of courtship through fully fledged young. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
5. East Mesa Guided Discovery Hike Area	November 1 – March 31	April 1 – October 31	Pronghorn movement. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
6. Pronghorn Plateau Discovery Hike Area	September 1 – November 30	December 1 – August 31	Protection of raptor nesting and allows for initiation of courtship through fully fledged young. Seasonal Pronghorn movement corridor in the area. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
7. Kaibab Crossing Discovery Hike Area	September 1 – May 31	June 1 – August 31	Impacts to soils from the August monsoon season can affect cultural resource stability. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.

Analysis Area 1. Resource Preservation Zone (No Visitor Use)

Location Overview. The resource preservation zone is the largest management zone in the backcountry, encompassing most of the monument's total acreage. Nearly all lands in this management zone are eligible wilderness.

Based on the emphasis of the desired conditions for preservation of the resources in this zone, the visitor capacity for the Resource Preservation Zone is zero.

Visitor Capacity and Implementation Strategies. Based on the emphasis of the desired conditions for preservation of the resources in this zone and the exceptional quality and concentration of resources present in the area, including archeological and ethnographic resources, paleontological resources, and sensitive wildlife, the visitor capacity for the Resource Preservation Zone is zero.

The primary management strategy for enforcing the visitor capacity is visitor education on the need for certain areas of the monument to be closed for resource protection. Education and interpretation of these resources at the visitor center or on discovery hikes would allow visitors to understand the importance of the sites and why they are protected. Visitors are also able to readily experience expansive scenic views of these areas as they travel through the monument as well as in all visitor use areas. Additionally, the monument has implemented some engineering strategies to close visitor-created pullouts along road shoulders to deter visitors parking along the roadside and entering areas of the monument where they are not permitted. Finally, enforcement is a strategy that the monument uses to patrol and enforce the closure of the Resource Preservation Zone. If persons are found in this zone, rangers will educate them on the closure and use other enforcement tools to keep visitors out of the area, as needed.

Summary. For the Resource Preservation Zone, the current visitor capacity is 0 people. The new visitor capacity would remain the same at 0 people.

Analysis Area 2. Crack-In-Rock Guided Overnight Discovery Hike Area

Location Overview. The Crack-In-Rock Guided Overnight Discovery Hike Area is in the Discovery Zone and located in the northern central area of the monument. This analysis area includes a large portion of the northern "chimney" area of the monument, with bordering lands owned by Babbitt Ranches to the east, north, and west. This area also contains a significant amount of eligible wilderness lands. In the preferred alternative, this area has been expanded in the southeast section of the "chimney" area.

Visitor Capacity and Implementation Strategies. Based on a review of existing direction and knowledge, the presence of sensitive cultural resources, visitor safety, and desired conditions for the area, monument staff identified that the current use levels for the Crack-In-Rock area could be *maintained*. Therefore, the visitor capacity is 15 people per hike (consisting of up to 12 visitors and 3 required guides), up to eight times a year (four weekends in October and four weekends in April), for a total of up to 120 people per year. For all other months of the year (November through March and May through September), the visitor capacity for the Crack-In-Rock area is zero.

The National Park Service will continue to require visitors to sign up and be selected for spaces on the guided hikes. Guided access on the hikes in October and April will be the only visitor access provided to this area. Education before these hikes begin as well as interpretation along the way will highlight the importance of resource preservation, human impact on the landscape, and visitor

capacity. Hiking in this area will rotate between specific locations to allow time for areas to rest and resources to recover.

Summary. For the Crack-In-Rock Guided Overnight Discovery Hike Area, the current capacity is up to 120 people per year (managed as one group of 15 people/hike consisting of up to 12 visitors and 3 required guides, up to eight times a year). The new visitor capacity would remain the same at 120 people per year.

Analysis Area 3. Kaibab House and Kaibab House Extended Guided Discovery Hike Area

Location Overview. This analysis area includes both the current Kaibab House Guided Discovery Hike and the proposed *extended area*. The current Kaibab House Area is located near Nalakihu and Citadel and encompasses the area west and south of those pueblos, including South Mesa and Magnetic Mesa. The Kaibab House Extended Area would expand the Discovery Zone in the preferred alternative, including more area northwest into Cedar Canyon and south and southeast into Hulls Canyon and Ballcourt Wash. Beyond the parking area, this analysis area is primarily eligible wilderness.

Visitor Capacity and Implementation Strategies. Based on a review of existing direction and knowledge, presence of sensitive cultural resources, and desired conditions for the area, monument staff identified that the current use levels for the Kaibab House and Kaibab House Extended Area could be *maintained*.

Therefore, under the preferred alternative, in which guided hikes could continue both in the current Kaibab House area and in the new extended area, the visitor capacity for the entire Kaibab House Guided Discovery Hike (GDH) Area will remain at 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year. This capacity allows for up to 150 people per year in the area (up to 130 visitors and 20 guides). However, this use will be spread out over a larger area (both the current and extended areas) and over a longer duration than at present, which will reduce impacts to cultural resources and improve the visitor experience. These hikes can occur within the original Kaibab House Guided Discovery Hike Area between October 1 and June 30 or in the extended Kaibab House area from October 1 to December 31. At other times, these areas are closed to visitor use during the pronghorn calving season in the Hulls Canyon and Ballcourt Wash area, and the visitor capacity is zero.

Management strategies include requiring *guided access only* to this area and managing the group size for each hike to be a maximum of fifteen people. Visitors must sign up for the hike through the visitor center staff, who manage the list and keep the numbers within the acceptable capacity. Specific hike locations may vary to allow certain areas within this analysis area to rest between uses.

Summary. For the Kaibab House Guided Discovery Hike Area, the current visitor capacity is 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year, for a maximum of 150 people per year. The new visitor capacity would remain the same at 150 people per year.

Analysis Area 4. Antelope House Guided Discovery Hike Area

Location Overview. The Antelope House Guided Discovery Hike Area is in the central part of the monument, near Antelope Wash and southwest of the “chimney” area that extends north of the Crack-In-Rock Road and west of the Little Colorado River. This area is in eligible wilderness, except for the unmaintained access road.

Visitor Capacity and Implementation Strategies. Based on a review of existing direction and knowledge, presence of sensitive cultural resources, concerns related to erosion and its impacts on natural and cultural resources, and desired conditions for the area, monument staff identified that the current use levels for the Antelope House Area were not achieving desired conditions and could not be maintained. Therefore, use levels should be *decreased*.

During the winter season (November 1–March 31), the visitor capacity has been identified as 10 people per day (consisting of up to 8 visitors and 2 guides), not to exceed 10 days per year. This capacity allows for up to 100 people per year in the area. From April 1–October 31, the area is closed to visitor use for resource and habitat protection and the visitor capacity is zero. It should be noted that there may be additional seasonal closures between December 1 and July 31 as needed to protect rare and sensitive raptors.

Management strategies include requiring guided access *only* to this area and managing the group size for each hike to be a maximum of 10 people: eight visitors and two guides. Visitors must sign up for the hike through the visitor center staff, who manage the list and keep the numbers within the acceptable capacity. Additional management strategies could include allowing the area to rest between uses, efforts to recover the eroded areas, potentially through avoidance of fragile areas (preferred), and the addition of water bars.

Summary. For the Antelope House Guided Discovery Hike Area, the current visitor capacity is 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year, for a maximum of 150 people per year. The new visitor capacity would be 10 people per day (consisting of up to 8 visitors and 2 guides), not to exceed 10 days per year or a maximum of 100 people per year.

Analysis Area 5. East Mesa Guided Discovery Hike Area

Location Overview. The East Mesa Guided Discovery Hike Area is east of Lomaki Pueblo, northeast of Citadel, and supports the East Mesa Discovery Hikes. All of this area, except the frontcountry parking area, is in eligible wilderness.

Visitor Capacity and Implementation Strategies. Monument staff identified that the visitor capacity for the East Mesa Discovery Hike Area could *maintain* current use levels based on existing direction and knowledge and desired conditions.

During the winter season (November 1–March 31), the visitor capacity has been identified as 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year. This capacity allows for up to 150 people per year in the area. At all other times of the year (April 1–October 31), the area is closed to visitor use for resource and habitat protection and the visitor capacity is zero.

Management strategies include only allowing guided access to this area and managing the group size for each hike to be a maximum of 15 people. Additionally, the SOP requirement that the area be used seasonally and allow time to rest, allows for only 10 days of use each year, supporting the identified capacity.

Summary. For the East Mesa Guided Discovery Hike Area, the current visitor capacity is 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year, for a maximum of 150 people. The new visitor capacity would remain the same at 150 people per year.

Analysis Area 6. Pronghorn Plateau Discovery Hike Area

Location Overview. In the future, under the preferred alternative, the National Park Service could allow visitor access in a new area of the monument, east of Antelope Prairie and north of Doney Mountain. All of this analysis area is in eligible wilderness.

Visitor Capacity and Implementation Strategies. Currently, Pronghorn Plateau Discovery Hike Area is not open to visitors; therefore, the use levels should be *increased* to accommodate new use. Based on existing direction and knowledge as well as the desire to provide visitor opportunities to experience wilderness values, the capacity has been identified as up to 16 people a week, managed as two groups. Specifically, this could include up to 6 people per group for *unguided* access and up to 8 people per group for *guided* access (consisting of up to 6 visitors and 2 guides). Pronghorn Plateau would be open to visitor use September 1 through November 30, and the weekly capacity would be implemented during that time. This capacity allows for up to 224 people per year in Pronghorn Plateau. From December 1 through August 31, this area would remain closed for raptor nesting and pronghorn migration, so the visitor capacity is zero. Locations on the plateau would also rest between use to allow for recovery from visitor use.

This capacity would be implemented through a combination of guided day, guided overnight, and/or unguided day use and could occur both on weekends and weekdays. Unguided use of this area will only occur if monitoring is in place and will be by permit only.

Summary. For the Pronghorn Plateau Discovery Hike Area, the current visitor capacity is 0 people. The new visitor capacity would be 16 people per week during the open season (September through November), managed as two groups per week, up to 224 people per year. Note that the numbers of visitors to guides would vary based on which kind of experience was provided—guided or unguided—but up to 168 visitors and 56 guides could be in the backcountry per season.

Analysis Area 7. Kaibab Crossing Discovery Hike Area: Area Within NPS Boundaries

Location Overview. The Kaibab Crossing Discovery Hike Area is an area of the monument that could be opened to permitted visitor use under the preferred alternative. Because the Coconino National Forest is open to general recreational use, this analysis area consists solely of the 0.3-mile section on NPS lands (hereafter referred to as the “area within NPS boundaries”); the capacity identified in this document is only applicable to the monument lands. Most of the Kaibab Crossing Discovery Hike Area is in eligible wilderness, subject to further analysis as part of a future wilderness study.

Visitor Capacity and Implementation Strategies. Currently, the portion of this route within monument boundaries is not open to visitors; therefore, monument staff identified that the visitor use for the area within NPS boundaries would be *increased* to accommodate new use in the area. Based on existing direction and knowledge, the presence of cultural resources, and identified desired conditions, the capacity has been identified as two separate groups of up to 8 people a week from September 1 through May 31. This capacity as identified in this document allows for up to 640 people per year in the area. This area is closed to access during the summer because of weather and safety concerns for both visitors and NPS staff. Permitting hikes up to two times a week allows the resources to have some time for recovery and limits the impacts of repeated visitor access. From June 1 to August 31, the visitor capacity for this area is zero.

Implementation strategies include defining the route in places where needed (e.g., minimal wayfinding markers); education about how visitors can access the route; requiring a permit for access; and clear signage, including that a permit is required to access the route when entering Wupatki National Monument from USFS lands (Coconino National Forest).

Summary. For the Kaibab Crossing Discovery Hike Area NPS segment, current visitor use is 0 people. The new visitor capacity would be 16 people per week during the open season (September through May), managed as two groups per week, up to 640 people per year.

Summary of Visitor Capacity

The following table shows the current and proposed visitor capacities for all seven analysis areas (table 4).

Table 4. Summary of Visitor Capacity (current and new) by Analysis Area

#	Analysis Area	Current Visitor Capacity	New Visitor Capacity
1	Resource Preservation Zone	0 (Closed to protect resources)	0 (Closed to protect resources)
2	Crack-In-Rock Guided Overnight Discovery Hike Area	Up to 120 people per year, managed as one group of 15 people/hike, up to eight times a year (96 visitors, 24 guides)	Same (120/year max.) (96 visitors and 24 guides)
3	Kaibab House Guided Discovery Hike Area	15 people per day (PPD), not to exceed 10 days/year (150/year max.) (130 visitors, 20 guides) Includes only existing Kaibab House GDH Area	Same (150/year max.) (130 visitors, 20 guides) Includes both existing Kaibab House GDH and the extended Kaibab House GDH Area in the NPS preferred alternative
4	Antelope House Guided Discovery Hike Area	15 PPD, not to exceed 10 days/year (150/year max.) (130 visitors, 20 guides)	10 PPD, not to exceed 10 days/year (100/year max.) (80 visitors, 20 guides)
5	East Mesa Guided Discovery Hike Area	15 PPD, not to exceed 10 days/year (150/year max.) (130 visitors, 20 guides)	Same (150/year max.) (130 visitors, 20 guides)
6	Pronghorn Plateau Discovery Hike Area	0 people	16 people per week (PPW) during the open season (Sept–Nov), managed as two groups per week (224/year max.) (168 visitors, 56 guides)
7	Kaibab Crossing Discovery Hike Area: NPS segment	0 people	16 PPW during the open season (Sept–May), managed as two groups per week (640 visitors/year max.)

MITIGATION MEASURES AND BEST PRACTICES

Congress has charged the National Park Service with managing the lands under its stewardship “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (NPS Organic Act, 54 USC 100101(b) et seq.). As a result, the National Park Service routinely evaluates resources and implements mitigation measures whenever conditions are present that could adversely affect national park system resources.

To ensure that implementation of the backcountry management plan protects natural and cultural resources unimpaired for future generations and provides for a high-quality visitor experience, a consistent set of mitigation measures and best management practices that align with federal regulations and NPS *Management Policies 2006* would be applied to all management actions. The

National Park Service has generated a list of mitigation measures, as well as general best management practices, for key topic areas related to this plan.

Cultural Resources

- Known archeological sites would be monitored to assess and document the effects of natural processes and human activities on the resources. Archeological resources would be left undisturbed and preserved in a stable condition to prevent degradation and loss of research values unless intervention could be justified based on compelling research, interpretation, site protection, or park development needs. Recovered archeological materials and associated records would be treated in accordance with NPS *Management Policies 2006*, NPS Museum Handbook, and 36 CFR Part 79.
- An archeologist who meets the Secretary of the Interior professional standards would assist facilities crews with compliance monitoring.
- The National Park Service would consult with associated American Indian tribes to ensure tribal perspectives are considered and that project actions are conducted in a way that respects the beliefs, traditions, and other cultural values.
- Sensitive, sacred, or traditional use areas would be protected to the greatest extent possible by avoiding known areas of importance, mitigating adverse impacts to ethnographic resources through resource protection efforts, retaining site confidentiality as appropriate, and continuing to provide tribal access to resources and places of cultural importance.
- Should natural processes or human activity in the backcountry unearth previously undiscovered cultural resources, access would be limited in the area of discovery, and a qualified archeologist would be contacted to assess the artifacts and/or site. The National Park Service would consult with the state historic preservation office and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13.
- In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered within visitor use areas, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 and the Flagstaff Area National Monuments inadvertent discovery plan would be followed.
- NPS staff would continue to inform visitors and others of the importance of protecting and not disturbing archeological resources and historic resources. Visitors would be informed (through NPS educational and interpretive programs and/or interpretive media products, and ranger contacts) of the penalties for illegally collecting artifacts or otherwise causing resource damage.

Natural Resources

- The National Park Service would apply best management practices according to NPS *Management Policies 2006*, specifically with reference to 4.4.2 – Management of Native Plants and Animals; 4.4.2.3 – Management of Threatened or Endangered Species; and 4.4.4 – Management of Exotic Species, and other sections that would apply.
- Staff would consult with NPS natural resource personnel before plan implementation to ensure impacts to vegetation and wildlife are kept to a minimum as described in this plan.

- For wildlife and bird species of management concern (both breeding and migratory), the National Park Service would implement the general and habitat protection measures found in the USFWS Nationwide Standard Conservation Measures (USFWS 2016), with reference to individual species' periods of activity.
- For soils, in areas where routes are formalized, and to the extent feasible and wherever the limits of grading areas are adjacent to sensitive vegetation communities or other biological resources, the National Park Service would remove only the minimum amount of vegetation necessary for route maintenance.
- For soils, in areas where route segments are formalized, the National Park Service would modify the route and location to use the general contours of the landscape; reflect actual soil, parent material, and topographic conditions; and construct to direct water flow to minimize erosion.

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CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Consistent with the 2020 Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1501.9), guidance in Section 4.2.E of the 2015 *NPS NEPA Handbook* and NPS Director's Order 75A: *Civic Engagement and Public Involvement*, the National Park Service used civic engagement and interdisciplinary team discussions to identify important issues to be analyzed in detail in the backcountry management plan and GMP amendment/environmental assessment (plan/EA), and to identify those issues that could be eliminated from further study.

As a result, the National Park Service determined the following issues should be carried forward for detailed analysis in this plan/EA.

- Visitor Access and Experience
- Wilderness Character: Solitude or Primitive and Unconfined Recreation
- Cultural Resources (Wilderness Character: Other Features of Value)

The analysis of environmental consequences of the no-action alternative and the preferred alternative focuses on these same issues. The analysis is based on expected changes that each alternative would have on the current conditions of the resources and resource trends. This analysis includes beneficial and adverse impacts that would likely result from implementing any of the alternatives considered in this plan. Appendix E discusses the alternatives considered but dismissed.

Additional issues and topics were considered during the development of this plan. See appendix F for brief descriptions of the impact topics discussed during the development process but ultimately dismissed from detailed analysis and the accompanying rationale.

VISITOR ACCESS AND EXPERIENCE

Affected Environment

Under current management, 2,668 acres of the Wupatki National Monument backcountry have the potential for visitor access through guided discovery hikes. Visitation to the backcountry comprises just a small percentage of the monument's total visitation, with an average of 4.5% of visitors engaging in guided discovery hikes or the overnight Crack-In-Rock hike (Arizona State University 2017). Up to 486 visitors (and 84 accompanying guides) have the opportunity to access the backcountry through discovery hikes.

Beyond the archeological sites accessible from the frontcountry, the remainder of the monument is either closed to visitor use or open only seasonally to guided access. Visitors are provided information on how and when to access the backcountry through the NPS website and at the Wupatki National Monument Visitor Center.

Because of the highly sensitive cultural resources in the backcountry and throughout the entire monument, the National Park Service manages access through guided hikes only. The National Park Service offers three discovery hike routes to different areas of the monument and locations of interest. These hikes occur on Saturdays and Sundays between October and March to three areas of the monument: Antelope House, Kaibab House, and East Mesa (see figure 2). Spots on these hikes are reservable by phone and are limited to 13 visitors plus 2 NPS-sanctioned guides (NPS staff or

volunteers). The Antelope House, Kaibab House, and East Mesa Guided Discovery Hikes can each accommodate a maximum number of 130 visitors per year (managed as 13 visitors and 2 guides per day, not to exceed 10 days per year) for a total of 390 visitors per year between the three hikes (excluding guides).

Each hike provides the opportunity for half-day guided hikes into the backcountry to experience the natural, undeveloped terrain and gain a sense of the past through encounters with prehistoric and historic landscapes. Each of the discovery hikes provide a different kind of backcountry experience as described in chapter 2. The Antelope House Discovery Hike takes visitors to Antelope House, a three-story pre-contact pueblo, surrounded by expansive views of the upper Wupatki Basin and Doney Cliffs. The Kaibab House Discovery Hike includes geology such as the Citadel Sink and earthcracks and cultural sites, including fieldhouses; rock writings; and Kaibab House, a two-story pre-contact pueblo located over an earthcrack. The East Mesa Discovery Hike interprets several pre-contact pueblos on mesa tops and provides views of Citadel, Nalakihu, and the San Francisco Peaks. These hiking routes are rotated, and no one route is visited two weeks in a row to prevent areas from being significantly impacted and to allow some rest and restoration of the sites.

The monument offers one guided overnight experience that provides visitors the opportunity to experience challenge and adventure over a 14- to 16-mile round-trip hike through rugged terrain and to enjoy the monument's dark night skies. These Saturday to Sunday overnight trips provide access to the Crack-In-Rock area of the monument, which includes several prominent mesas with a variety of associated archeological resources such as rock writings and Crack-In-Rock Pueblo, a 12th-century Ancestral Puebloan site located on top of Crack-In-Rock Mesa. Spots on the Crack-In-Rock hike are available through a lottery system and limited to 12 participants and three NPS guides, and a fee is charged for the hike. The Crack-In-Rock Guided Overnight Hike Area can accommodate up to 96 visitors (managed as groups of 12 participants and 3 guides up to eight times a year).

To protect sensitive cultural resources, guided hikes are kept to small groups and occur seasonally. The small group sizes for all guided experiences and a robust interpretive component for each of these hikes is critical to ensure that visitors are provided with an immersive opportunity to learn about the dynamic natural environment and rich cultural history of the monument and to provide for high levels of resource protection.

Under current hiking capacities, monument staff leads up to 38 discovery hikes to the backcountry annually, accommodating a maximum of 486 visitors (and a total of 84 accompanying guides). However, weather, availability of guides, and other considerations can affect the occurrence of hikes.

Trends and Planned Actions. Planned rehabilitation of existing visitor trails at Citadel and Lomaki Pueblo and Box Canyon Pueblos areas may temporarily impact parking areas that serve as backcountry access. Trail rehabilitation work would also improve accessibility and make the trails less visible from backcountry areas, which would improve the visitor experience in the backcountry. These projects may also impact wilderness character, which is discussed in the wilderness character section below. Routine NPS management actions—such as inventory, monitoring, and other resource management activities—could lead to brief encounters between visitors and uniformed NPS staff or field crews. Interactions with NPS staff may impact individuals' experiences of the monument. Impacts from climate change (see cultural resource section below) may also impact the visitor experience, temporarily or permanently reducing access to sites impacted by flash flooding and wildfires. Guided hikes are also impacted by extreme weather and may be cancelled due to extreme heat or cold.

Impacts on Opportunities for Visitors to Access and Experience the Backcountry

Alternative 1: No-Action Alternative

Under alternative 1, the conditions and trends for visitor access and experience in the backcountry (including eligible wilderness) discussed above would continue.

The discovery hikes would continue to require a reservation and preplanning to regulate the number of people per hike, thus providing access to a limited number of visitors. The no-action alternative provides limited reservations for backcountry experiences: up to 486 visitors (and 84 accompanying guides). The reservation requirement would continue to reduce spontaneity and flexibility in visiting key areas and diminish the visitor experience of those who prefer to enter the backcountry without planning ahead. Additionally, making a reservation requires planning and knowledge of the area and may prevent some visitors from experiencing the backcountry areas altogether. Because of this, the no-action alternative may continue to adversely impact those visitors that prefer to recreate without a reservation.

Visitors to the backcountry would continue to experience dark night skies, wilderness qualities, and cultural resources. The popular discovery hikes to Antelope House, Kaibab House, and East Mesa that provide high-quality immersive interpretive experience in the backcountry would continue. Managed access for the half-day discovery hikes and Crack-In-Rock guided overnight hike would continue to play a role in ensuring high-quality visitor experiences by keeping groups small and providing for immersive experiences in the resource.

Alternative 2: NPS Preferred Alternative

The preferred alternative would increase opportunities for visitors to access and experience the backcountry through guided and unguided hiking experiences. A total of 4,105 acres would have the potential for visitor access through guided discovery hikes and/or unguided experiences. This represents an increase from current management of 1,437 acres in management zone acreage that has the potential for visitation to certain areas within the zone. The monument would continue to provide current guided day and overnight experiences; however, new areas of the backcountry—Pronghorn Plateau Area and Kaibab Crossing Route within Wupatki National Monument—could be opened to both guided and unguided use to increase opportunities for access. Currently, only 4.5% of the monument's visitors access the backcountry (Arizona State University, 2017). Under the preferred alternative, this number would likely increase. Managed access on the half-day guided discovery hikes and overnight hikes would continue to provide the same adverse impacts to ease of access to the backcountry as the no-action alternative. For the new unguided opportunities, a permit system would be established, requiring visitors to complete an on-site orientation that covers wilderness values, significant or sensitive resources, Leave No Trace principles, wayfinding, and general conditions of the area. The requirement to go through an NPS-led orientation and obtain a permit could be considered an adverse impact for those who prefer to recreate without pre-planning. However, the orientation and managed access are considered essential to protect the resources from visitor impacts as well as for the preservation of the solitude and primitive or unconfined recreation wilderness quality (as described below). Additionally, the new unguided hikes in the preferred alternative represent the bulk of the increase in visitor access to the backcountry in this alternative, which would be an entirely new opportunity for those who prefer the freedom to recreate on their own.

The preferred alternative would provide for an overall increase in the number of people that are able to access the backcountry. Unguided use to the new Pronghorn Plateau Area would add up to 168

visitors per year and the Kaibab Crossing Route would add access for up to 640 visitors per year. Both areas are currently closed to visitor access. This increase in the number of backcountry opportunities would benefit visitors by increasing access to the WUPA backcountry, including eligible wilderness. Overall, the number of visitor spots on guided discovery hikes and permits for unguided access would increase by approximately 156%, providing up to 1,244 visitors access to the backcountry compared with 486 in the no-action alternative (note that these use numbers are only for visitors and do not include guides). For Pronghorn Plateau, the overall capacity is 224 people, which accounts for guides, should a guided experience be implemented. This, however, would not affect visitor access to the area. Maximum visitor access to Pronghorn Plateau would be 168, regardless of whether the access is guided or unguided.

One area would see a decrease in access because of resource preservation concerns. Access on the Antelope House Discovery Hike would be decreased from 130 visitors (and 20 guides) to 80 visitors per year (and 20 guides)—a 38% decrease in visitors for that area. However, data from the 2018 and 2019 guided discovery hikes indicated that fewer than 50 people per year typically participate in the Antelope House Discovery Hike. Therefore, reducing the annual number of participants from 130 to 80 participants would still allow for access consistent with, if not beyond, what typically occurs in the Antelope House area based on recent participation numbers. Data also showed that individual hikes were not always full, also suggesting that this decrease in total participants would have a minimal impact on visitor access and experience.

Environmental Consequences Associated with Indicator and Threshold Adaptive Management Strategies

Under alternative 2, the monument would add three indicators to an already robust monitoring program. These indicators—the spatial extent of visitor-created trails, the spatial extent of barren core areas, and artifact displacement—would be in addition to ongoing vulnerability assessments, archeological site monitoring, site steward monitoring, and artifact inventories, collecting an abundance of data on resource conditions, visitor impacts, and tracking changes over time. The “Indicators and Thresholds” section of the preferred alternative identifies a number of adaptive management strategies that would impact visitor use and experience in the project area. As these strategies are adaptive, they would only be implemented if conditions dictate. Since these strategies could be pursued if the action alternative is selected, they are analyzed here under the action alternative.

Spatial Extent of Visitor-Created Trails

To reduce impacts of the spatial extent of visitor-created trails, one of the adaptive management strategies that monument staff could implement would be to close certain discovery hike areas until efforts to stabilize and recover are successful. This action could temporarily reduce access to specific locations; however, in most cases a reroute of hiking experiences is likely possible and, although the exact location of the hike or experience would be changed, visitors would still have access to the backcountry in most cases. Closures of specific areas could be for several weeks up to the duration of the season, depending on impacts and the needed recovery time for an area. Exact closure times would vary and would be determined by the amount of damage, vegetation type, and site gradient, which all impact the time that would be needed for site recovery. For the most severe damage, an area could be closed for up to a year; however, because the visitor access season is only a portion of the year, those longer closures would likely not impact the visitor experiences differently than a season-long closure. Additionally, temporarily closing an area or site to visitor use would not necessarily decrease use. Standard operating procedures for the discovery hikes requires time for

rest and recovery of each route, and no single route may be used twice in a row. Potentially, this could mean that areas needing to be temporarily closed for restoration could simply be removed from the discovery hike rotation; no discovery hikes would need to be cancelled and access would not be decreased.

However, if an area was completely closed for the visitor use season because of adaptive management and no reroute or alternate location was possible, it could result in reducing the availability of backcountry access by up to 130 visitors per year for both the Kaibab House and East Mesa areas, a reduction of 80 visitors per year for Antelope House, and reduce access for up to 168 visitors a year if Pronghorn Plateau was closed. Any closure to the Kaibab Crossing Route would only be for the .3 miles within monument boundaries and could result in eliminating backcountry access for up to 640 people per year. Although full closures with no alternative for visitor access are possible, they would be rare. This action would adversely impact a visitor's ability to access the specific areas that would be closed until the temporary closure is ended. Because the purpose of the closure is ultimately to enhance the quality of the visitor experience in these areas, long-term beneficial impacts are anticipated once visitors are able to return to the area. The discovery hike areas included in the preferred alternative, Kaibab House extended area, and Pronghorn Plateau, provide additional areas to lead discovery hikes if some areas need to be temporarily closed. This flexibility would reduce the likelihood that discovery hikes would be canceled. Rather, they could be rerouted to one of the other hike areas that provide access to similar resources and experiences. Because of highly sensitive resources, one of the areas where a full closure would be possible is the Kaibab Crossing Area. If a full closure of this area occurred, it could result in eliminating access for up to 640 visitors. This reduction would be notable, as it represents almost 50% of the total visitation to the backcountry. However, under this scenario, there would still be a 24% increase in visitor access compared to the no-action alternative. This reduction in use would have a positive effect on opportunities for solitude, as discussed in the wilderness character section below. Such a closure would only take place if impacts to irreplaceable cultural resources were severe and other measures, including changing unguided opportunities to guided opportunities in the area, had been unsuccessful in reducing resource impacts.

Spatial Extent of Barren Core Areas

To reduce the spatial extent of barren core areas caused by soil compaction and devegetation associated with social trailing and concentrated use, monument staff may alternate use of areas between the guided discovery hike areas (Antelope House, Kaibab House Extended Area, East Mesa, and Pronghorn Plateau) until efforts to stabilize/recover are successful. As stated above, closure times will vary and are impacted by a variety of factors. While this would temporarily reduce access to specific locations, the additional discovery hike areas included in the preferred alternative, Kaibab House extended area, and Pronghorn plateau, provide additional areas to lead discovery hikes if some areas need to be temporarily closed. Therefore, it is not likely that discovery hikes would need to be canceled, but rather that they would be rerouted to one of the other hike areas that provide access to similar resources and experiences. Long-term, however, the strategy of alternating use of areas would have the same beneficial impacts described above by improving overall resource quality, adding to the quality of the visitor experience.

Additionally, monument staff could close certain areas to discovery hikes until efforts to stabilize and recover are successful. As described above, if an area was closed for the full season to recover, it could result in reducing backcountry access (see the numbers identified in the Spatial Extent of

Visitor-Created Trails above). This would have the same beneficial and adverse impacts to the visitor experience also described above under reducing impacts to the spatial extent of visitor-created trails.

A third adaptive management strategy to reduce barren core areas would be to consider lowering group size numbers under the following conditions:

- Immediately following a rain event or throughout the monsoon season to reduce impact on wet and erodible soils.
- Where geographic constraints or other resource conditions would cause larger groups to disperse off trail, increasing the potential for expanded barren core areas.

Depending on the size and rate of development of the barren core areas, changes to group size could be for just one hike, for a whole season, or could change for multiple seasons, depending on barren core area recovery. This change in group size would have a negative effect on visitor access for the duration of the reduction in group size numbers, which could vary, as stated above. This reduction in group size would improve opportunities for solitude, as described in the analysis of impacts to wilderness character below.

Artifact Displacement

Artifact displacement and theft are major concerns in the backcountry and eligible wilderness due to the irreversible nature of the impact. The preservation of thousands of artifacts and their locations in the cultural landscape are key to protecting the integrity of sites. To reduce the impacts of any artifact displacement occurring from visitor use, an adaptive management strategy would be to temporarily halt hikes in areas where collection piles are observed, document activities, and assess if the area should be reopened.

This could mean closing the whole hiking area or specific sites within an area, depending on resource conditions and management decisions. Sites would be closed at least long enough to complete damage assessments and could remain closed indefinitely depending on the impacts to the site. In the most extreme cases of impacts, sites may be permanently closed to visitors to preserve irreplaceable resources such as artifacts and architecture. Implementing this strategy could have temporary or permanent impacts on the visitor experience, depending on whether the area is determined eligible to be reopened. This determination would be made based on the extent of impacts to the site.

An additional adaptive management strategy specific to the Pronghorn Plateau and the Kaibab Crossing Route within Wupatki National Monument would be to change any unguided access to guided-only. This would reduce the types of visitor experiences available in the backcountry. The opportunities to be in the backcountry without a guide, to practice self-reliance, and experience more solitude and a sense of adventure would be eliminated if unguided access was no longer permitted. The Kaibab Crossing Route would provide up to 640 more visitors unguided access to new areas of the monument, and the Pronghorn Plateau Area could provide up to 168 visitors access. If either of these areas were to be closed due to cultural resource impacts as indicated by collection piles, it would reduce the overall number of permits available for unguided access and reservations for guided access to the backcountry.

Conclusion

Under the no-action alternative, impacts to visitor access and experience would continue to be adverse. Visitors would have relatively limited access to the Wupatki backcountry and no unguided access. All existing access would continue to be managed under a reservation or lottery system that while continuing to preserve monument resources, would provide immersive experiences only for those visitors able to get a spot on one of the limited backcountry guided discovery hikes.

The implementation of backcountry management under the NPS preferred alternative would result in permanent beneficial improvements to opportunities for visitors to access and experience the backcountry, including eligible wilderness. Beneficial improvements would occur due to increased guided and unguided access to areas previously closed to visitor use in the backcountry, including the possibility of permitted, unguided day-use access. The preferred alternative would provide up to 1,244 visitors access to the backcountry, compared with 486 in the no-action alternative (not including guides on guided hikes). This is a 156% increase in visitor access to the backcountry. Additionally, under the preferred alternative, management zones that allow visitor access to the backcountry would be increased by approximately 1,437 acres. (See table 2; compare 4,034 acres for the Discovery Zone under the preferred alternative versus 2,598 acres for the Guided Adventure Zone in the no-action alternative.) This increase in the area of management zones that allow visitor use would provide management flexibility in rerouting discovery hikes and continuing to provide access if certain locations need to be closed for restoration or recovery, thus largely preserving visitor access, even when closures occur. In most locations, reroutes for visitor access would be available, so impacts to visitor access would likely be minimal, even if some closures do occur.

Visitor access to certain locations within the backcountry could be limited at times due to temporary closures or decreased group sizes put in place to protect and restore areas heavily impacted by visitor use. These changes would result in impacts to visitor access to specific locations, dependent on the severity of the resource impacts, that could last for weeks to an entire year. Once reopened, the improved quality of the resources that resulted from the closure and allowing for resource recovery in these areas would restore a high-quality visitor experience. The overall quality of the experience for backcountry users would be enhanced through the continued use of registration and permitting systems, which would provide for small group sizes and immersive experiences with the natural and cultural resources. Adverse impacts to the visitor experience, lasting up to one full visitor use season, could result if monitoring suggests that visitor impacts are meeting or surpassing thresholds and the adaptive management strategy to change proposed unguided experiences to guided only experiences is implemented at the Pronghorn Plateau or Kaibab Crossing Discovery Hike Areas. This would reduce the types of experiences available to visitors, eliminating the unguided experience and reducing the number of acres potentially open to visitor use. If the determination is made that the Kaibab Crossing Discovery Hike Area would need to be closed entirely to visitor use, the impact would be noteworthy, potentially reducing visitor access to the backcountry by nearly 50% from the new levels established in the preferred alternative. However, even with these adjustments, the preferred alternative would still increase opportunities for visitors to experience the backcountry by 118 visitors, which would be an increase of 24% compared to current conditions.

WILDERNESS CHARACTER: SOLITUDE OR PRIMITIVE AND UNCONFINED RECREATION

Affected Environment

Approximately 96% of Wupatki National Monument (approximately 34,198 acres) is eligible wilderness (figure 6). As required by NPS *Management Policies 2006*, the National Park Service will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed. The monument's Natural Setting / Wilderness is identified as a fundamental resource and value (FRV)—the attributes that are essential to achieving the purpose of the monument and maintain its significance—in the monument's 2015 Foundation Document. The Natural Setting / Wilderness description states that “the largely undeveloped terrain conveys wilderness values through a sense of solitude, dark night skies, and natural quiet” (Foundation Document 2015, p. 6).

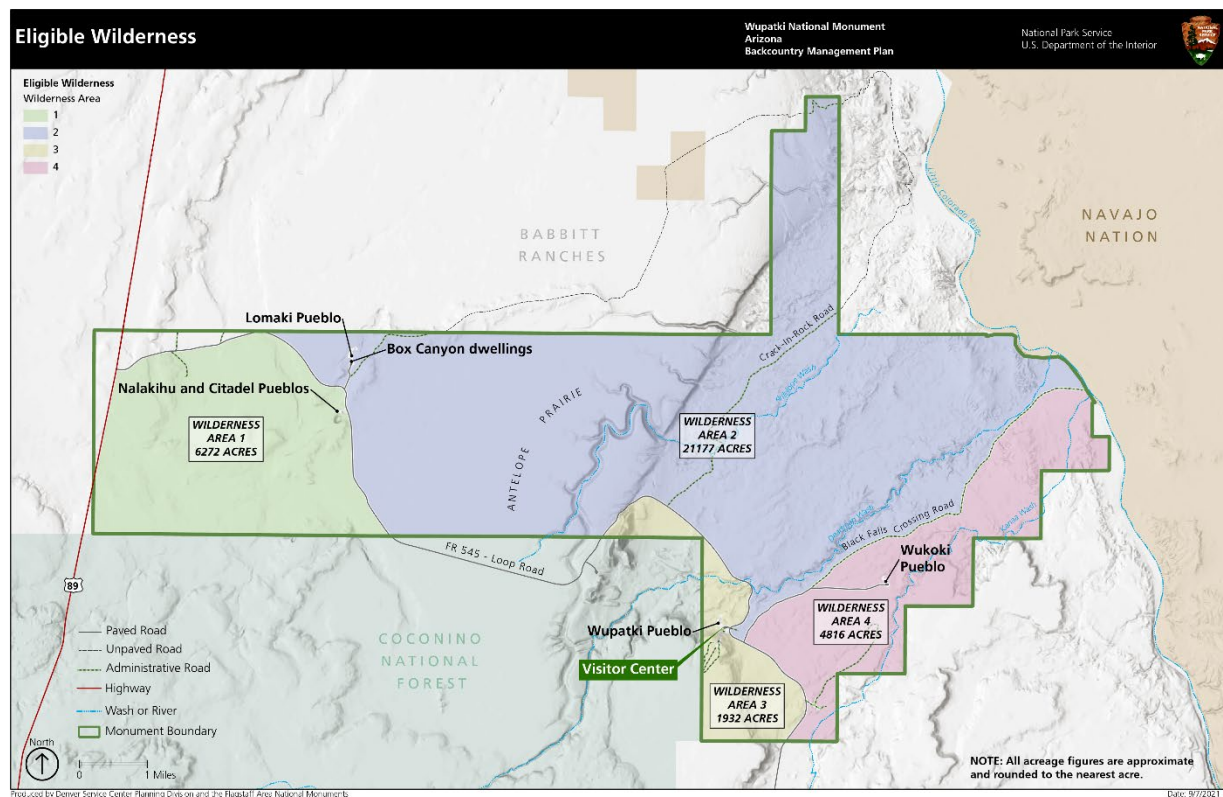


Figure 6. Wupatki Eligible Wilderness

Wilderness character is a holistic concept and managers have identified five distinct yet interrelated qualities of wilderness character that are derived from the language in the Wilderness Act. These five qualities are: natural, untrammeled, undeveloped, solitude or a primitive and unconfined type of recreation, and other features of value. There are currently some opportunities to experience these qualities close to the Flagstaff metro area (approximately 30-miles from downtown) in the Strawberry Crater Wilderness, a 10,141-acre wilderness area within Coconino National Forest, which is adjacent to the southern border of Wupatki National Monument. This area does not have the same managed access as Wupatki National Monument; there is a primitive hiking trail and cross-country, off-trail travel is permitted throughout the area. However, the Wupatki Wilderness

Character Narrative (NPS 2017) identifies the monument’s vast archeological record of human habitation dating back approximately 13,000 years as an “other feature of value” central to the character of the eligible wilderness (Waters and Stafford 2007). Opportunities to experience this landscape and connect to the vast human history represented at Wupatki National Monument are unparalleled and enhance the values of solitude, opportunities for reflection, and primitive recreation. Therefore, this section focuses on the quality of solitude or a primitive and unconfined type of recreation, while potential impacts to the other features of value quality are analyzed under the “Cultural Resource” impact topic below. See appendix F for a brief dismissal of the other three qualities of wilderness character.

Solitude is defined as “the state of being alone or remote from habitation or the sights and sounds of other people; the experience of being in an unfrequented or secluded place” (Reference Manual #41). Primitive and unconfined recreation in eligible wilderness means the area is “relatively free from the encumbrances of modern society [for] the experience of the benefits and inspiration derived from self-reliance, self-discovery, physical and mental challenge, and freedom from societal obligations” (Landres et al. 2015, p. 11–12). Eligible wilderness lands within Wupatki National Monument evoke a sense of peace and quiet in the vast high-desert wilderness and utter silence and total isolation from modern society. The eligible wilderness proves a challenging venue for backcountry exploration and recreation, requiring primitive navigational skills, situational awareness, and a sense of adventure. This wilderness quality is degraded by settings that reduce these opportunities, such as encounters with other wilderness visitors, signs of modern civilization in or adjacent to the wilderness area, facilities provided by the agency or created by users that reduce the self-reliance of people, and management restrictions on visitor behavior.

Currently, visitor use occurs within two zones that overlap the Wupatki eligible wilderness—i.e., the Extended Learning Zone and the Guided Adventure Zone (approximately all of which is eligible wilderness). Together, these add up to approximately 2,645 acres that allow visitor use in eligible wilderness (see table 2). Access to the backcountry eligible wilderness areas is through NPS-guided hikes as described above in the Visitor Access and Experience section. To participate in these hikes, visitors need to sign up for one of a limited number of spots on a hike, which often requires planning ahead to get signed up in time. As they are currently offered, groups average around 10 people at a time but can be up to 15 people (12–13 visitors plus guides), staying together and following an official guide through the area. As visitors are with a group for the duration of their hike, opportunities to experience being alone or remote from the sights and sounds of other people are very limited, though they are still afforded with the sense of being in an unfrequented or secluded place, allowing for some sense of solitude. Visitors do not experience primitive recreation as they are following a guide on a predetermined route. All visitors to the eligible wilderness are confined to the discovery hike group and must stay with their guide, so opportunities for unconfined recreation are not present. Requirements for self-reliance are minimal as hikers can depend on help and support from their trained guides or other group members if needed. As a result, opportunities for solitude and self-reliance are limited, while opportunities for primitive or unconfined recreation do not currently exist in eligible wilderness.

Trends and Planned Actions

Other ongoing and foreseeable actions in and around the monument include NPS management actions such as inventory, monitoring, management of natural and cultural resources, and actions to address potential impacts from climate change (e.g., increases to frequency and intensity of flash flooding and wildfires). These management actions could lead to encounters between visitors and

uniformed NPS staff or field crews, the presence of temporary and minimal unaccompanied installments of scientific equipment, and changes to the landscape to support resource health (e.g., invasive species removal). For example, rehabilitation of existing trails and infrastructure in developed areas that serve as access points to the eligible wilderness is ongoing and may affect the solitude quality of the area due to localized noise and visual impacts from equipment staging, workers, and/or tools throughout the 6–12 months to complete the project. Foreseeable projects include reconstruction of the Citadel trail within its current footprint, with one goal being to reduce visual impacts and improve the viewscape. Monument staff will be undergoing an earthcrack monitoring survey in the next year. The survey would take no longer than one year, during which there could potentially be temporary installations and the presence of NPS staff in the backcountry, specifically in areas with earthcracks. This project has minimal expected impacts to the solitude and primitive or unconfined quality, though some viewscape impacts could be possible.

The neighboring Navajo Nation, across the Little Colorado River (LCR) to the northeast of the monument, has undertaken construction of wells and other water infrastructure for agriculture and livestock that is partially visible from certain locations within monument boundaries. There is potential for further development around these areas that could contribute dust and potentially nighttime lighting. This development contributes to the general existing condition around the monument as all existing infrastructure and development, including these wells, affects viewsheds related to wilderness character.

Impacts on Opportunities for Solitude or Primitive and Unconfined Recreation

Alternative 1: No-Action Alternative

Under the no-action alternative, the trends and planned actions discussed above would continue. There would be no new impacts on wilderness character under this alternative.

Alternative 2: NPS Preferred Alternative

Implementation of the preferred alternative would expand opportunities for visitors to experience solitude and primitive and unconfined recreation in the eligible wilderness. Areas within eligible wilderness in management zones that allow for visitor use would expand from 2,645 acres in the no-action alternative (in the Guided Adventure and Extended Learning Zones) to 4,078 acres in the preferred alternative (in the Discovery and Extended Learning Zones). Under this alternative, the National Park Service would continue to offer the three current guided day use discovery hikes in eligible wilderness (Kaibab House, East Mesa, and Antelope House), expand available area for these hikes (Kaibab House Extended Area), and open new areas in the eligible wilderness to new uses (e.g., Pronghorn Plateau). The National Park Service would also be able to provide an additional guided day hike in the eligible wilderness, as well as a new guided overnight experience in the eligible wilderness. At Pronghorn Plateau, a new use area in the monument, the National Park Service could provide guided day hikes and guided overnight hikes (as well as unguided day use as detailed further below). A guided day hike at Pronghorn Plateau could provide opportunities for up to 168 additional visitors per year to experience the eligible wilderness, and though guided, the groups would allow a maximum of 6 visitors and 2 guides, allowing for more opportunities for solitude. In total, the number of visitors in the preferred alternative who could participate in the guided discovery day hikes in the backcountry (most of which is eligible wilderness) could increase by 24% from the no-action alternative (from 486 to 604 visitors).

The preferred alternative would also provide a new guided overnight experience on Pronghorn Plateau for smaller groups (a maximum of six visitors and two guides). This overnight experience would provide visitors with an opportunity to feel a measure of solitude. Visitors could also view dark night skies, experience the natural sounds and sights of the backcountry, and feel a sense of remoteness from modern life. While there would be opportunities for interpretation from the guide, this experience would emphasize wilderness qualities and experiences. This new overnight access at Pronghorn Plateau could provide up to 168 more visitors with the opportunity to experience primitive and unconfined recreation in the Wupatki eligible wilderness. An important note is that the total visitor capacity for Pronghorn Plateau could be distributed in a number of different ways between guided day and overnight access, as well as potentially unguided day use (as outlined below), based on resource protection.

Unguided day-use access to the eligible wilderness would also potentially be provided in the Pronghorn Plateau Discovery Hike Area, which would become a designated use area without trails or required routes, consistent with the quality of unconfined recreation. Visitors would find their own path and experience the landscape as they choose, not confined to a trail. The .3 miles of the Kaibab Crossing Discovery Hike within monument boundaries could also allow unguided access to areas of eligible wilderness. Visitors would be required to complete orientation and obtain a permit for unguided access (as analyzed in the Visitor Access and Experience section). This requirement would impact the unconfined recreation experience as visitors would need to plan ahead and obtain permission to access the areas. However, these requirements are necessary to preserve cultural resources, solitude, and other irreplaceable resources and values in the monument. A capacity for unguided day-use access in the Pronghorn Plateau area would be established and include a maximum of six people per group, one group at a time.

Because of the increased opportunities for visitors to experience solitude and primitive and unconfined recreation in the backcountry through unguided day use and new small group, guided overnight experiences, the preferred alternative provides a beneficial impact to the wilderness character.

Environmental Consequences Associated with Indicator and Threshold and Visitor Capacity Adaptive Management Strategies

Impacts to solitude or primitive and unconfined recreation from monitoring indicators and thresholds or strategies for implementing the visitor capacity are primarily related to visitor access as described above in the Visitor Access and Experience impact topic. As outlined above, strategies related to the development of visitor-created trails or barren core areas and the discovery of any artifact collection piles would lead to similar management actions. If triggers or thresholds are met or exceeded, additional education or orientation would be provided to further inform visitors of their impacts and how to minimize them. These would be part of the guided discovery hike or the permit orientation for unguided use. This would be an adverse impact to opportunities for unconfined recreation as it would require additional time and effort for visitors before they can embark on their hikes. Management would be able to temporarily close (potentially for one week up to a whole season) certain routes or areas or allow them to rest longer between hikes. These temporary closures would impact access to the area, decreasing the number of potential routes providing access, with the potential of reducing the number of people who could experience solitude or primitive and unconfined recreation. However, temporarily closing an area or site to visitor use would not necessarily decrease use. Standard operating procedures for the discovery hikes requires time for rest and recovery of each route and no single route may be used twice in a row. Potentially, this could

mean that areas needing to be temporarily closed for restoration could simply be removed from the discovery hike rotation, no discovery hikes would need to be cancelled, and access would not be decreased. In addition, if triggers or thresholds were met or exceeded in the Pronghorn Plateau or Kaibab Crossing Discovery Hike Areas, any unguided use could be changed to guided-only access and/or temporarily closed as described for the other discovery hike areas. Changing access from unguided to guided would adversely affect the new opportunities for both solitude and primitive and unconfined recreation in the preferred alternative but would protect the other features of value quality of wilderness.

Other impacts to solitude or primitive and unconfined recreation from ongoing or planned projects within and around Wupatki National Monument would be the same as outlined in Alternative 1: No Action.

Conclusion

Under the no-action alternative, impacts to the wilderness quality of solitude or primitive and unconfined recreation would continue to be adverse, as opportunities to experience solitude are limited and there are no opportunities for primitive and unconfined recreation.

Full implementation of the preferred alternative would result in long-term beneficial impacts by increasing opportunities for solitude or primitive and unconfined recreation through additional guided and new unguided experiences in new areas of the monument. The preferred alternative expands visitor access to over 1,400 additional acres of eligible wilderness. Opportunities to experience solitude or primitive and unconfined recreation and to pursue challenging recreational opportunities as well as the natural and undeveloped landscape of the eligible wilderness would be available and more accessible. Under current conditions, there are very limited opportunities for solitude within the Wupatki eligible wilderness, as all access to the backcountry requires guides. While there are other wilderness areas in the Flagstaff metro area, the Wupatki National Monument eligible wilderness provides more than 4,000 additional acres of wilderness that visitors could access within the proposed Discovery and Extended Learning Zones (see table 2). The eligible wilderness also provides unique opportunities to experience solitude or primitive and unconfined recreation that connect visitors to the past through the outstanding archeological features and vast recorded human history of Wupatki National Monument. If the preferred alternative was fully implemented, up to 168 visitors per year could have an unguided, primitive, and unconfined experience in the Pronghorn Plateau Discovery Hike Area, and up to 640 visitors per year could have a similar experience along the Kaibab Crossing Discovery Hike route. Both areas are in eligible wilderness. This is a substantial increase from the no-action alternative because under current management, no unguided access of the eligible wilderness or other backcountry areas is available. This increase in unguided visitor use would not likely impact overall opportunities to experience solitude, as access would be managed via permits. Therefore, numbers of people at one time in these areas would remain small. It is also important to note that current wilderness boundaries are subject to change, following completion of a wilderness study and proposal. These new potential unguided experiences in eligible wilderness would allow visitors to be in small groups of their own choosing, and they would be the only group in the area. They would not be following a guide or a formal trail and would be able to experience that sense of finding their own way and experiencing unconfined recreation. Opportunities to experience these wilderness qualities would increase by up to 864 visitors per year.

CULTURAL RESOURCES

Affected Environment

As stated in the Wupatki National Monument Foundation Document (NPS 2015), the monument was established in 1924 and later expanded to “preserve and protect thousands of archeological sites scattered across the stunning landscape of the Painted Desert and the grassland prairies, including several larger, prominent pueblos atop fiery red sandstone and black volcanic flows.” Cultural resources—which include archeological sites, historic and prehistoric structures, ethnographic resources, cultural landscapes, and continuing cultural practices—are featured prominently in the monument’s foundation document. These resources are central to three of the four identified significance statements (archeology, connections from past to present, and scenery and setting) and weave through the monument’s interpretive themes. As fundamental resources essential to maintaining the monument’s legislated purpose, archeological resources “warrant primary consideration during planning and management processes.” Additionally, the monument’s vast archeological record has been identified in the Wupatki Wilderness Character Narrative (NPS 2017) as an “other feature of value” that contributes to the distinct character of the Wupatki eligible wilderness, as mentioned above under the impact topic “Wilderness Character: Solitude or Primitive and Unconfined Recreation.”

Archeological sites recorded during the monument-wide survey completed in the 1980s reflect a millennium of human activities. The National Register-listed Wupatki National Monument Historic District includes more than 2,700 contributing cultural sites spread across the entire 35,254 acres that make up the NPS unit; the National Register of Historic Places (NRHP) district’s boundary is congruent to the boundary of the monument (Cameron and Schieck 1992). In some areas of the monument’s backcountry, archeological site density exceeds 100 sites in a square mile, creating an astounding temporal and geographic record of life in the high desert. Prehistoric sites with architectural elements—which may include multi-story pueblos, fieldhouses, and pithouses—make up the majority of sites found in the planning area. Surface artifacts, such as sherds and lithics, are scattered throughout the district and are highly visible even to the untrained eye. Standing architectural structures, agricultural features, and exceptional rock writings harmonize with the natural environment and work together to create a cultural landscape that memorializes the resourcefulness of the Ancestral Puebloan people and the connection between the natural and cultural resources within the Wupatki eligible wilderness.

Thirteen American Indian tribes consider monument lands to be part of their ancestral home and cultural origins. The natural features, landscape, and species found throughout the project area hold continued significance to these traditionally associated groups. Archeologists and researchers are still gaining an understanding of the interplay of the seemingly harsh environment and generations of its inhabitants as they adapted their unique way of life and developed traditional ecological knowledge.

Routine cultural resource management activities within the backcountry include permitted scientific research; preservation projects performed by Flagstaff Area National Monuments (FLAG) staff and NPS Vanishing Treasures Program at maintained archeological sites; and site monitoring by NPS archeologists, NPS law enforcement rangers, and trained volunteer site stewards. Regularly scheduled cultural resource inventory efforts, data collection, and archeological site monitoring provide NPS staff opportunities to increase knowledge of the archeological sites and document changes in their conditions. All archeological sites have been inventoried, and location and condition

information have been entered into the NPS Cultural Resources Inventory System (CRIS) for long-term management. Under NPS *Management Policies 2006*, cultural resources located within Wupatki eligible wilderness are included in wilderness character monitoring and are managed as other features of value of the eligible wilderness.

As stated in the monument strategic monitoring plan, “While monitoring in itself does not mitigate impacts to sites, [the current] monitoring program is built to provide realistic and feasible recommendations on ways in which to address site degradation. The monitoring program should not just assess the condition of sites but provide an avenue in which FLAG can identify damage so that it may be mitigated” (Covert 2020, 1). As part of the backcountry planning process, monument cultural resource staff created a tool to evaluate sites’ overall vulnerabilities and assist future monitoring and mitigation efforts (Appendix H). The vulnerability assessments captured the condition of individual sites and analyzed factors that contribute to the potential for human impacts: accessibility of the site, fragility of resources, portability of artifacts, visibility of the site or artifacts, and signs of previous disturbances. The presence of burial features or human remains would automatically result in a high vulnerability rating. A total of 362 sites across the proposed expanded Discovery Hike areas were assessed between January and July 2020 as part of the backcountry planning effort. Of the sites, approximately 71 % (256 sites) were considered to have low vulnerability, 20% (73 sites) were rated as having moderate vulnerability, and only 5% (19 sites) were considered to have high vulnerability (Covert and Hough 2020, p. 15). Some of the low vulnerability sites have special considerations, including poor site condition, fragile/vulnerable cultural material type, and artifact scatters with very few artifacts, but on the whole, “many sites are not vulnerable to the backcountry activities proposed in the backcountry management plan” (Covert and Hough 2020, p. 15). The vulnerability assessment findings helped shape the proposed visitor activities included in this plan and provide additional baseline information for future monitoring.

Trends and Planned Actions

Any human activity in areas where there are archeological sites can cause damage to archeological resources. Surface artifacts, sensitive sites, and/or fragile cultural resources are more prone to localized impacts. Anyone travelling in the backcountry of Wupatki National Monument—including professionals conducting permitted research activities and NPS staff performing routine preservation or maintenance activities—could contribute to soil compaction or erosion at archeological sites. Surface artifacts are also at risk for trampling or unauthorized collection. However, these types of impacts are minimal because of NPS presence on all discovery hikes, the highly controlled number of people allowed in the backcountry, and the types of NPS operations and research activities allowed in the backcountry and eligible wilderness sections of the historic district. Annual site monitoring, cyclic preservation projects, and research activities would continue under current management, providing opportunities for NPS staff to gather knowledge about the broader archeological landscape, standing architectural features, and traditional cultural knowledge associated with backcountry resources. The robust cultural resource monitoring would continue and would incorporate additional data collected as part of the 2020 vulnerability assessments.

While there is no new NPS management action planned within Wupatki eligible wilderness that are expected to affect cultural resources within the archeological historic district, climate trends may impact archeological and ethnographic resources throughout the monument. Climate change experts predict hotter temperatures, drier conditions, and more intense precipitation events for northern Arizona (Baril et al 2018, Gonzalez et al. 2018). Storms dropping a large amount of water over dry soils in a short period of time contribute to flash flooding that could wash away surface

artifacts, destroy the temporal and geographic context of archeological sites, and severely weather remaining masonry, especially resources located near natural drainages. Warming temperatures and prolonged periods of drought could result in more intense wildfires in areas of the monument with dense or woody vegetation. Increased fuel loads of dried, drought-affected vegetation could allow fire to cover more acreage than it would under typical conditions. Wildfire can scorch surface artifacts and destroy the wood and masonry elements of architectural remnants. The planned update to the monument fire management plan will provide more guidance on fire management activities and detailed analysis of how the National Park Service can best protect cultural resources in the Wupatki eligible wilderness in the era of climate change.

Impacts on Archeological Resources and Ethnographic Resources in the Backcountry

Alternative 1: No-Action Alternative

Under alternative 1, the conditions and trends discussed previously would continue.

Although discovery hikes are limited to 15 individuals or fewer to allow adequate supervision, visitors participating in guided hikes occasionally create unintentional trails within the existing use areas. Artifact collecting, vandalism, or other forms of site disturbances also sometimes occur during guided activities, although NPS presence on all discovery hikes and the limited number of discovery hike participants limits opportunities for destructive visitor behaviors. These visitor actions likely would continue to result in loss of surface artifacts, loss of archeological site integrity, destruction of standing architectural features and/or loss of data potential, which are all permanent impacts to individual sites and detrimental to the overall condition of the monument-wide archeological district.

Alternative 2: NPS Preferred Alternative

Under the preferred alternative, additional lands would be removed from the Resource Preservation Zone and added to the Discovery Zone, which would allow monument staff to consider phasing in additional visitor access opportunities in the backcountry and Wupatki eligible wilderness. Adverse impacts related to human impacts described under the no-action alternative would also be possible under the preferred alternative. Increasing the frequency of guided discovery hikes, expanding the visitor use areas, and adding the potential for unguided backcountry access in Pronghorn Plateau and Kaibab Crossing would increase the potential for surface disturbances, inadvertent damage, intentional damage, soil compaction, and trampling of in situ archeological resources within the historic district. Increased guided discovery hikes to sites not previously developed may result in similar visitor-related impacts within backcountry areas that are currently protected by the closure. Social trailing in areas where unguided hiking could be allowed could lead to exposure or damage of in situ archeological resources. Increased vandalism and artifact collecting may occur as more members of the public know where archeological sites, historic structure remains, and surface artifacts are located. Individuals who previously participated in a guided discovery hike or spent time unaccompanied in the backcountry could return to the area for unlawful activities. Together, these permanent, localized impacts could result in loss of context and integrity for contributing archeological sites within the national register district.

While any adverse impacts to archeological resources are permanent and could destroy the research potential and integrity of archeological sites within the NRHP-listed district, it is highly unlikely these impacts would affect the overall integrity of the historic district and associated landscape

because of the vast size and large number of documented sites that make up the Wupatki National Monument Archeological District. A relatively small number of visitors would be able to participate in guided discovery hikes (up to 604 visitors annually) and/or secure permits for unguided backcountry day use (up to 808 visitors annually) under the proposed visitor capacities. (Note that this number reflects the fact that Pronghorn Plateau could be either guided or unguided and is calculated in both places for this analysis. Total visitation to the backcountry would be up to 1,244 visitors.) This highly managed level of visitation—combined with expanded visitor orientation and wilderness education in Leave No Trace principles and the robust monitoring system and established guided hike operating procedures—should ensure limited impacts to the archeological sites themselves and the district due to visitor use and activities. Cultural practitioners would continue to have access to desired areas, plants, and other natural resources under the existing special use permit system. General visitor access would be regulated via the backcountry permit system to avoid times and locations when ceremonies or other culturally important practices were taking place.

Although the management zones allowing visitor use in the backcountry would be expanded from 2,598 acres to 4,034 acres under the preferred alternative, the majority of the monument's lands (30,419 acres or approximately 86% of the monument) would remain under the Resource Preservation Zone and would have no change in visitor use. While the Discovery Zone allows for hiking, each guided hiking route covers only a small portion of the management zone, and potential impacts related to unauthorized activities would continue to be mitigated by the presence of trained guides. Only Pronghorn Plateau and Kaibab Crossing areas would be considered for unguided access. Future management actions related to visitor-use impacts for these areas are identified within the indicator and threshold management strategies mentioned within the preferred alternative.

Environmental Consequences Associated with Indicator and Threshold and Visitor Capacity Adaptive Management Strategies

The NPS preferred alternative includes three identified indicators that would be monitored to maintain minimum acceptable resource conditions in the backcountry and the associated management strategies that may be implemented if changes in resources conditions are documented. All of the strategies associated with the indicator related to spatial extent of visitor-created trails—actively managing group size; increasing spatial dispersion through cross-country travel, randomizing routes, and rerouting hikes; using two-track roads when present; increasing visitor education; limiting the number of groups; and potentially closing discovery hike areas/routes for up to a season—would directly benefit cultural resources. By monitoring and actively managing social trails, monument staff could document and try to prevent a widespread informal trail system and concentrated foot traffic that could lead to erosion, soil compaction, and damage to surface artifacts if left unmanaged. Much like visitor-created trails, barren core areas also have the potential to concentrate visitor use, attract additional foot traffic to high visibility sites, damage surface artifacts through trampling and destroy sites through collection of high-visibility artifacts. Artifact displacement specifically addresses the evidence of unlawful collection of artifacts; this indicator was selected because of the importance of Wupatki National Monument's archeological resources and the trigger was identified to support desired conditions of the monument's cultural resources. Monitoring the creation or growth of social trails, core barren areas, and collection piles would help NPS resource managers document any changes in cultural resource conditions and implement management strategies to minimize human impacts to archeological resources and continue to preserve these resources for generations to come.

Conclusion

Under continuation of current backcountry management, impacts related to visitor use—soil compaction, erosion, and artifact collecting—could occur during NPS-guided discovery hikes or as a result of unaccompanied and unauthorized entry. Implementation of the preferred alternative would increase the number of visitors in the backcountry, which would also increase the potential for human-related impacts to surface artifacts, prehistoric and historic archeological sites, architectural elements, agricultural features, and rock writings that contribute to the Wupatki National Monument National Register District and to the distinct character of the Wupatki eligible wilderness. These impacts could occur regardless of the level of visitor use, so they are also possible under current management. Although management zoning updates under the preferred alternative would expand backcountry visitor use and therefore potential for impacts to cultural resources, more than 30,000 acres of the of the monument (approximately 86%)—and the overlying Wupatki National Monument archeological historic district—would remain in the Resource Preservation Zone and would continue to receive the highest level of long-term protection. Visitor-related impacts to cultural resources within the defined backcountry visitor use areas would be limited through use of the resource condition indicators and thresholds outlined in the preferred alternative and related management actions that prioritize the cultural resources the monument was established to protect. Active resource monitoring, visitor education, and the management strategies proposed within the preferred alternative would allow monument staff to minimize and respond to any potential cultural resource impacts.

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CHAPTER 4: CONSULTATION AND COORDINATION

LIST OF AGENCIES AND GROUPS CONSULTED DURING PLAN DEVELOPMENT

Arizona Archeological Society North Arizona Chapter
Arizona Department of Game and Fish
Arizona State Historic Preservation Office (SHPO)
Babbitt Ranches
Coconino County Board of Supervisors, Districts 2 and 4
Flagstaff – Shawn Johnson
Flagstaff Area National Monuments Volunteers
Flagstaff Trails Initiative
Friends of Flagstaff Area National Monuments
Friends of Flagstaff's Future
Fort McDowell Yavapai Nation
Havasupai Tribe
Hualapai Tribe
Hopi Tribe of Arizona
Kaibab Band of Paiute Indians
Office of US Senator Martha McSally (AZ) (former)
Museum of Northern Arizona
National Parks Conservation Association
Navajo Nation Cameron Chapter
Navajo Nation Leupp Chapter
Navajo Nation Coalmine Chapter
Navajo Nation Birdspring Chapter
Navajo Nation Tolani Lake Chapter
San Carlos Apache Tribe of Arizona
San Juan Southern Paiute Tribe of Arizona
Office of US Senator Krysten Sinema (AZ)
Sierra Club
Tonto Apache Tribe of Arizona
Turrell Land Company/Roden Crater
US Forest Service, Coconino National Forest
US Fish & Wildlife Service, Arizona Fish and Wildlife Conservation Office
White Mountain Apache Tribe
Western National Parks Association
Wilderness Society
Yavapai-Apache Nation
Yavapai-Prescott Indian Tribe
Zuni Tribe of the Zuni Reservation

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Paul Whitefield, Natural Resource Specialist (former)

DOI Unified Regions 6, 8

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Rose Verbos, Visitor Use Management Specialist

NPS Washington Support Offices

Wendy Berhman, Program Analysis, Park Planning and Special Studies
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Roger Semler, Chief, Division of Wilderness Stewardship

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APPENDIX A: RELATIONSHIP TO OTHER WUPATKI NATIONAL MONUMENT PLANNING DOCUMENTS

This document is part of Wupatki National Monument's planning portfolio. A park planning portfolio is the collection of planning documents that guides decision making and satisfies law and policy. The Wupatki National Monument planning portfolio creates a logical, trackable guide for park management actions. Certain established monument planning documents serve as important references for the current backcountry management plan and GMP amendment.

2004 General Management Plan. The National Park Service completed a GMP in 2002 (Record of Decision 2004) that provides overall management direction for the entire monument. In 2020, minor modifications to the 2004 management zones were approved by the Flagstaff Monuments (FLAG) superintendent and documented as a NEPA categorical exclusion under *CE Citation B.1: Changes or amendments to an approved plan when such changes would cause no or only minimal environmental impacts.* (Zoning refinements completed under this CE are described in appendix B.) This backcountry management plan updates management zoning and desired conditions for backcountry areas of the monument and reconsiders certain strategies from the GMP, such as self-guided trails that were not implemented. Additionally, this plan includes new visitor opportunities within the project area. Once approved, this document (i.e., the backcountry management plan) will act as a GMP amendment.

2013 Wilderness Eligibility Assessment. In 2012, the National Park Service prepared a wilderness eligibility assessment, which determined that approximately 96.5% of the monument's total area is eligible for wilderness designation and that approximately 3.5% of the monument is not eligible. In 2013, NPS Director Jon Jarvis concurred with the findings of this assessment. As a result, the National Park Service manages the Wupatki eligible wilderness in accordance with NPS policy to maintain wilderness character and values.

2015 Foundation Document. Wupatki National Monument's foundation document was completed and approved in 2015. Key sections of this foundation document, including significance and fundamental resources and values, articulate the importance of wilderness and associated resources. The foundation document identifies a backcountry management plan and a wilderness study as high priority planning needs. This backcountry management plan fulfills a portion of that need.

2017 Wupatki Eligible Wilderness: Wilderness Character Narrative and Baseline Monitoring Assessment ("Wilderness Character Building Blocks"). In August 2017, monument staff, in partnership with a wilderness fellow, completed Wilderness Character Building Blocks for the Wupatki eligible wilderness. This document includes a wilderness character narrative and a baseline monitoring assessment for wilderness character. The narrative describes the unique and often-intangible values of the Wupatki eligible wilderness, with the goal of cultivating a greater understanding of the monument's key features of wilderness character. The monitoring assessment offers a framework for understanding change to wilderness character over time and using that knowledge to inform management. The assessment provides data-based wilderness character measures and establishes a protocol for monitoring. These building blocks are intended to help monument personnel make carefully weighted wilderness stewardship decisions that respect and preserve wilderness character. This backcountry management plan outlines additional monitoring and defines indicators and thresholds, that while separate from the measures and standards

identified in the WUPA Wilderness Character Building Blocks, work in tandem to monitor monument resources and inform management strategies.

2020 Flagstaff Area National Monuments Five Year Strategic Monitoring Plan. This plan describes past and current cultural resource monitoring efforts at Wupatki, Sunset Crater, and Walnut Canyon National Monuments—the three NPS sites that make up Flagstaff Area National Monuments (FLAG). Monitoring goals identified as priorities over the lifespan of the strategic plan are to revisit known archeological sites, to assess the sites’ conditions, and to identify the types of impacts affecting or threatening the integrity of the sites. The plan’s reference section also includes pertinent forms, standard operating procedures, and monitoring references.

Wupatki National Monument Wilderness Study (future). Section 6.2.2 of NPS *Management Policies 2006* requires that all lands and waters determined eligible for wilderness designation be formally studied to develop a recommendation to Congress for wilderness designation. The objective of a wilderness study is to determine if and where eligible lands and waters within a national park unit should be proposed for wilderness designation. A study identifies a range of possible wilderness configurations within a park unit and evaluates their effects on the human environment. A wilderness study includes a range of alternatives, including a “no-action” alternative. An appropriate environmental compliance process and document is required to accompany all wilderness studies that propose legislation to designate a wilderness, and a public hearing(s) must be held as part of the process.

Separate from this backcountry management planning process, the National Park Service intends to prepare a wilderness study in the future. The forthcoming wilderness study would determine whether the National Park Service should propose lands within Wupatki National Monument for wilderness designation or for proposed potential wilderness, and the boundary for those lands as appropriate. Based on the findings of the study, a formal wilderness proposal may be submitted to the NPS Director for approval and subsequent consideration by the U.S. Department of the Interior, President, and Congress under the provisions of the Wilderness Act.

APPENDIX B: MANAGEMENT ZONING DEVELOPMENT

Management zoning is the method used by the National Park Service to identify and describe the appropriate variety of resource conditions and visitor experiences to be achieved and maintained in the different areas of a park unit. Management zones describe compatible combinations of desired natural and cultural resources conditions, associated opportunities for visitor use and experience, and the kinds and levels of management, access, and development that are appropriate to achieve desired conditions. Developing a spectrum of management zones is done within the bounds of the purpose and significance of the unit and reflects the desire to provide a variety of appropriate visitor experiences based on the capability of different areas to support and sustain different kinds of use. General management plans (GMP) for NPS units usually establish this unit-wide zoning scheme.

This appendix describes existing management zoning for Wupatki National Monument's backcountry (including eligible wilderness areas) and summarizes recent changes from the zoning scheme established in the 2004 general management plan.

MANAGEMENT ZONING FROM 2004 GENERAL MANAGEMENT PLAN

The 2004 WUPA general management plan established a zoning scheme for the entire monument that encompassed frontcountry areas where visitor use, facilities, and development are concentrated, as well as backcountry areas that contain fewer developments and visitor services. The 2004 zoning scheme describes seven different management zones for the monument (NPS 2002, p. 33–38):

- Resource Preservation Zone
- Guided Adventure Zone
- Extended Learning Zone
- Hiking Zone
- Administrative Zone
- Overview Zone
- Motorized Sightseeing zone

Of these, the zones that overlap backcountry areas of the monument include the Resource Preservation Zone, Guided Adventure Zone, Extended Learning Zone, and Hiking Zone.

Figure B-1 depicts management zoning from the 2004 general management plan. Colors and symbology have been adjusted to be consistent with other maps in this backcountry management plan.

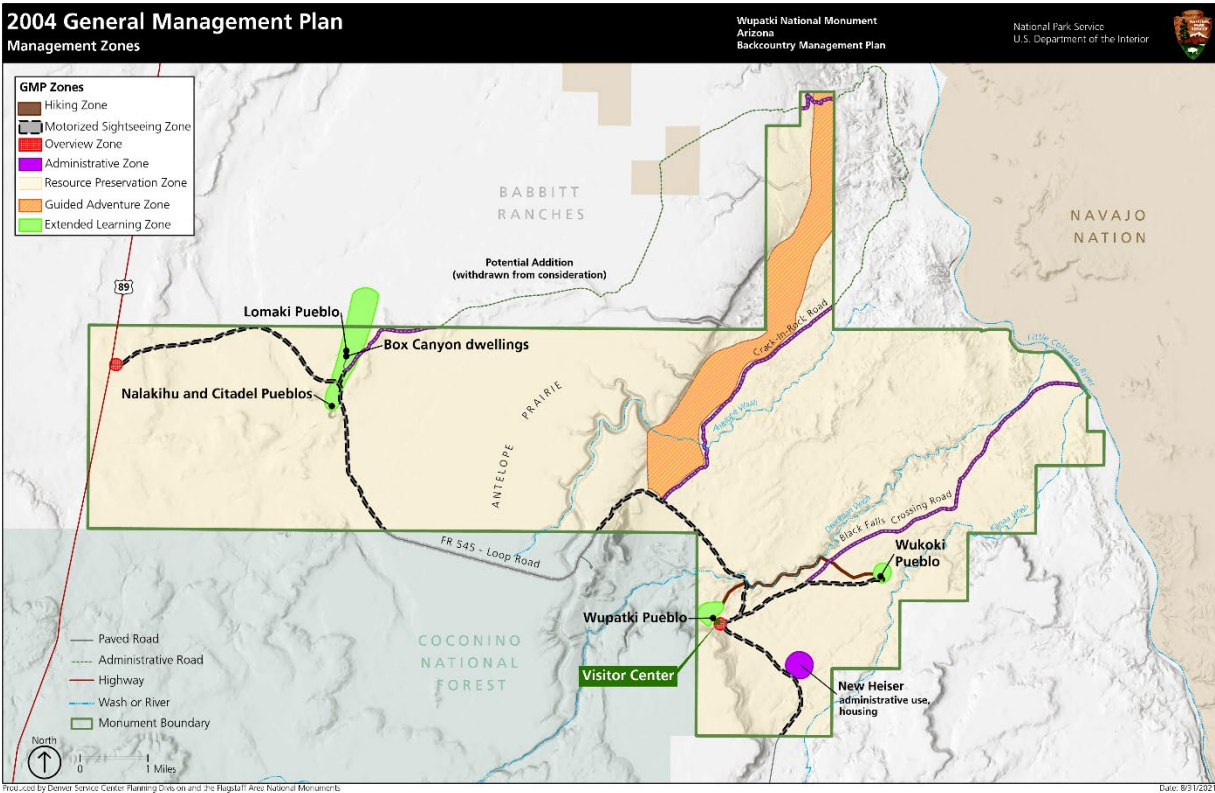


Figure B-1. Management Zoning from the 2004 General Management Plan

EXISTING MANAGEMENT ZONING (NO-ACTION ALTERNATIVE)

In 2020, the National Park Service modified the 2004 management zoning scheme to improve accuracy and precision. The geographic boundaries of certain zones were adjusted to reflect actual conditions on the ground, including the extent of existing administrative infrastructure as well as the precise locations of established discovery hikes. These changes were made through an internal NPS process using a categorical exclusion (under *CE Citation B.1: Changes or amendments to an approved plan when such changes would cause no or only minimal environmental impacts*).

These minor modifications were approved by the Flagstaff Area Monuments (FLAG) superintendent in June 2020, thereby amending the zoning from the general management plan. This amendment did not authorize any new on-the-ground activities or infrastructure that had not been previously outlined. The following list summarizes modifications outlined in the categorical exclusion:

- The Guided Adventure Zone was expanded to include the current areas of the Kaibab House and East Mesa Discovery Hikes.
- Minor adjustments were made to the boundary of the Guided Adventure Zone to more accurately reflect areas included in the existing Crack-In-Rock Discovery Hike.
- The Overview Zone boundaries were refined near the two main entrances to the monument and in the vicinity of the visitor center.
- Adjustments were made to the boundaries of the Extended Learning Zone.
- The boundaries of the Administrative Zone were corrected to accurately depict locations of existing administrative facilities and infrastructure.

- The areas for the utility corridor were further defined in updated maps.
- The GMP's Hiking Zone, which included proposed self-guided trails that were never implemented, was removed.

In summary, current management zoning for Wupatki National Monument reflects the GMP management zoning scheme as modified in 2020. Figure B-2 illustrates the existing management zoning as of June 2020 when these changes were approved

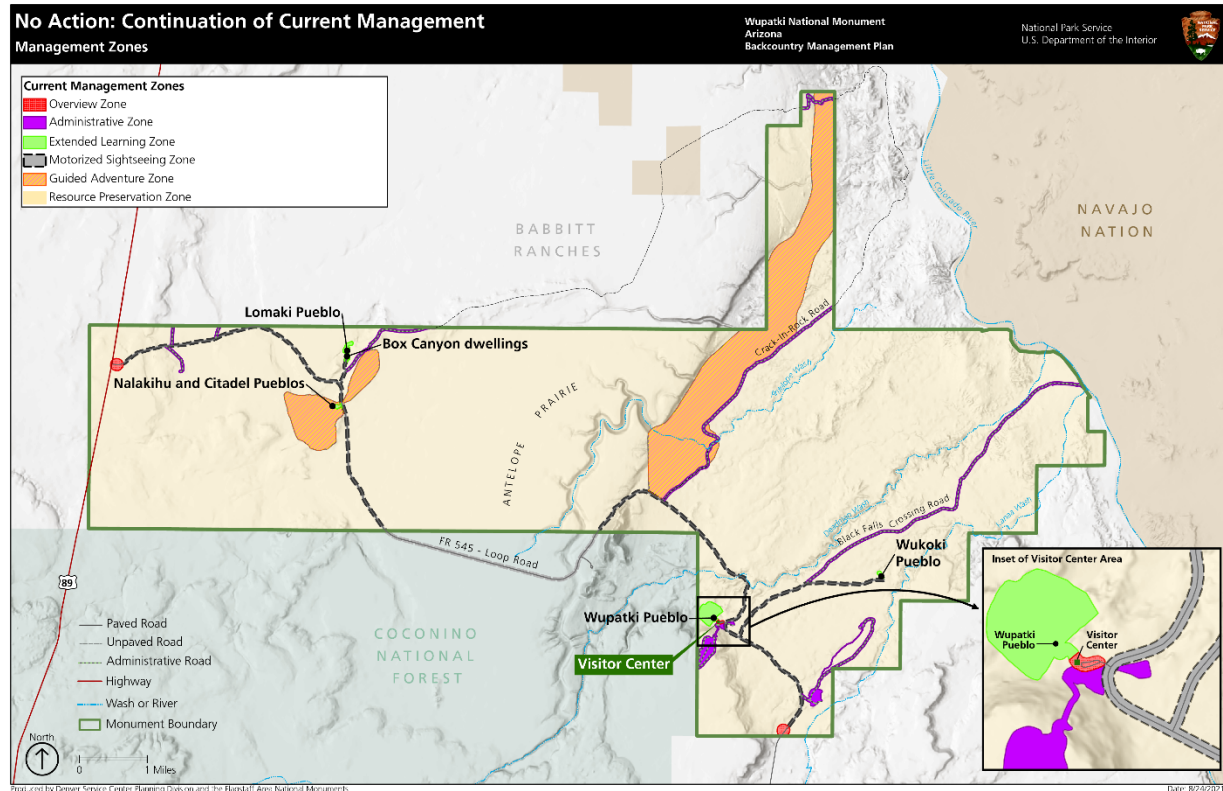


Figure B-2. Existing Management Zoning for Wupatki National Monument from the 2020 Categorical Exclusion (No-Action Alternative)

While the 2020 categorical exclusion (discussed above) adjusted the boundaries of certain management zones and made other small modifications, it did not amend the narrative descriptions of management zones established in the 2004 general management plan. Because the general management plan was completed prior to the 2013 wilderness eligibility assessment, which found that more than 96% of the monument was eligible for wilderness, zone descriptions did not reference wilderness. Additionally, in some cases, the 2004 zone descriptions did not provide enough detail to guide decision making to best support resource protection. Furthermore, the monument's 2015 Foundation Document defined the FRVs and the monument's purpose, "to preserve and protect the thousands of archeological sites scattered across the stunning landscape of the Painted Desert and the grassland prairies..." (p.4). Therefore, the National Park Service included updated description of all management zones in the proposed action/NPS preferred alternative to further emphasize the purpose and FRVs, to provide more context, and clarify management direction (chapter 2).

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APPENDIX C: INDICATORS AND THRESHOLDS FOR VISITOR USE MANAGEMENT MONITORING

INTRODUCTION

As part of the proposed action/NPS preferred alternative described in chapter 2 of the Wupatki National Monument Backcountry Management Plan, the National Park Service would implement indicators, thresholds, monitoring protocols, and management strategies specific to visitor use in the backcountry to assist in achieving and maintaining desired conditions. The development of these components follows the guidance of the Interagency Visitor Use Management Council's Visitor Use Management Framework (IVUMC 2016). Indicators translate the desired conditions identified in chapter 1 into measurable attributes (e.g., linear extent of visitor-created trails) that, when tracked over time, evaluate change in resource or experiential conditions from visitor use. These are critical components of monitoring the success of management actions and strategies. Thresholds represent the *minimum acceptable condition* for each indicator and were established by considering the desired conditions (see chapter 1), data on existing conditions, relevant research studies, and professional judgment of staff from management experience. An additional monitoring tool is the use of triggers, which identify conditions of concern for an indicator enough to prompt a management response before any threshold is crossed.

Monitoring is the process of routinely and systematically gathering data to assess the status of specific resource conditions and visitor experiences (IVUMC 9). Monitoring is an integral component of resource and visitor use management at Wupatki National Monument and allows managers to objectively and effectively evaluate whether desired conditions are being achieved and maintained. Monitoring also reveals how conditions change over time, including the rate and magnitude of change.

The indicators identified in this document do not represent an exhaustive list of all monitoring that is currently and will continue to be conducted at Wupatki National Monument. Because of its mandate to preserve the resources within the monument, the National Park Service already has a robust monitoring program for its cultural and natural resources that has been ongoing over the last 20 years (see appendix A for references to other monitoring documents). The three indicators identified in this plan were selected to evaluate changes in conditions related to visitor use levels. They consider which changes in resource conditions would prompt a different management response and what changes would cause the most concern. Additionally, the indicators are important and meaningful to the purpose of the unit, sensitive to change so they can be monitored, and directly connected to visitor use.

Visitor use management is an iterative process in which management decisions are continuously informed and improved through monitoring to determine the most effective way to manage visitor use to attain desired visitor experience and resource conditions. Information about NPS monitoring efforts, related visitor use management actions, and any changes to the indicators and thresholds would be available to the public. For each indicator, potential management strategies have been identified. Several of these strategies are currently in use at Wupatki National Monument (WUPA) and may be increased in frequency and/or intensity in response to changing conditions. These strategies represent the range of actions that the National Park Service may take in order to best meet the goals of this plan and desired conditions. If it were determined through monitoring that thresholds are being approached or exceeded, the National Park Service would implement one or

more of these management strategies. Adaptive management strategies are also identified. These are strategies that would be implemented based on feasibility, staff resources, and funding and only if and when conditions dictate, they are necessary. If additional strategies are needed, details of their application would be developed as thresholds are exceeded or approached and would be informed by monitoring results.

The interdisciplinary planning team considered the central issues driving the need for the plan and developed related indicators that would help identify when the level of impact would become cause for concern and management action may be needed. The indicators described below were considered the most critical, given the importance and vulnerability of the resource or experience affected by types of visitor use. They were also informed by current and ongoing monitoring at the monument.

The following indicator topics have been selected for monitoring in the backcountry of Wupatki National Monument:

- Spatial extent of visitor-created trails,
- Spatial extent of barren core areas,
- Artifact displacement

Each indicator is applied to the backcountry based on the 6 different visitor use areas (described as “use areas” throughout this appendix):

- Pronghorn Plateau Discovery Hike Area
- Kaibab House Extended Guided Discovery Hike Area
- East Mesa Guided Discovery Hike Area
- Antelope House Guided Discovery Hike Area
- Crack-In-Rock Guided Overnight Discovery Hike Area
- Kaibab Crossing Discovery Hike Area (specifically focused on the portion located on NPS land)

Wupatki National Monument offers guided hikes as part of the guided Discovery Hike Program. These hikes all occur in the proposed Discovery Zone, the vast majority of which is in eligible wilderness.

Thresholds can vary across these areas based on the resources within them and the type of visitor experience being offered.

INDICATOR TOPIC: SPATIAL EXTENT OF VISITOR-CREATED TRAILS

Indicator: Linear feet of visitor-created trail per use area.

Threshold: No more than 16 linear feet of visitor-created trails *total* within each use area.

Rationale: This indicator is related to vegetation trampling, soil loss and erosion, the protection of sensitive cultural resources, and visitor experience, all of which are key to maintaining desired conditions in the backcountry. Monument staff identified “functional soils, healthy vegetation cover, and natural geomorphic processes deter unwanted erosion or deposition” as desired conditions for the backcountry. Monument staff has also identified that backcountry and eligible wilderness areas

should remain free from trails and other developments to preserve viewsheds and the wilderness experience/character.

Visitor-created trails (also referred to as social trails) are linear tracks created by users that are noticeable to observers and are not an element of the designated trail system. As visitor-created trails develop, vegetation is trampled, soil is displaced or compacted, and loss of vegetation or increased erosion can occur. The backcountry includes diverse landscapes, including washes, plateaus, and earthcracks, covering a variety of topography and elevations. Trailing, including social trailing, can become more erosive, creating gullies, rills, and arroyos, on some landscapes and soils and particularly when they occur on slopes.

Areas of primary concern for this indicator include areas where unguided access could occur (for instance, Pronghorn Plateau and the Kaibab Crossing route), the Antelope House Discovery Hike area, and backcountry areas adjacent to frontcountry parking or where visitors set off into the backcountry. The guided discovery hike area to Antelope House has experienced some vegetation loss and erosion, leading to the development of a social trail leading to the pueblo. The guided discovery hikes have been approaching the site via a steep slope that has contributed to soil erosion and the trailing. The area is a concern to monument archeologists related to impacts on the resources and a desire to deter any further expansion of the trail. One outcome of this planning process is that monument staff identified the need to decrease visitor capacity at Antelope House, as the existing level of visitor use is leading to impacts on the resources. Continued monitoring of Antelope House, as well as in other discovery hike areas, will be important to inform management action and keep any social trails within the threshold.

As public access to the backcountry is currently restricted to guided access, visitor-created trails and access to closed preservation areas is of most concern at Pronghorn Plateau and the small section of the Kaibab Crossing route, where unguided access could be introduced. However, with the guided discovery hikes, there is still potential that trails could be developed by groups walking single-file or repetitively following the same route. Historically, visitor-created trails have primarily been an issue off frontcountry sites leading into the backcountry. Efforts to rehabilitate those trails included scattering branches and other minimal measures to obscure paths and these actions have been successful.

When visitor-created trails are visible, other visitors may follow, widening and deepening the tread, trampling more vegetation, and leading to soil loss. Managing the establishment and extent of visitor-created social trails supports the protection of natural resources and supports Wupatki National Monument's desired conditions that "the backcountry's juniper savanna, grasslands, and desert shrub lands are undisturbed" and "functional soils, healthy vegetation cover, and natural geomorphic processes deter unwanted erosion or deposition."

This indicator also helps protect cultural resources in the backcountry. The WUPA Wilderness Character Building Blocks Report states that "the Wupatki Eligible Wilderness holds one of the most densely populated archaeological landscapes in the Southwest" (p. 24) and that the "incredible archeological record found within the Wupatki eligible wilderness adds immense value to the Other Features of Value Quality of wilderness character" (p. 21). The observable presence of these trails could lead other visitors to follow, increasing the tread, making the path more pronounced, and potentially leading to unauthorized and undesirable access and impacts to cultural resources. Additionally, social trails lead to unstable geomorphology (e.g., soils, water/wind erosion) which destabilizes the landscape and destabilizes the cultural resources dispersed across that landscape.

Visitor experience is also impacted by the presence of visitor-created trails. Given its status as eligible wilderness, the vast majority of the Wupatki backcountry is managed for the preservation of wilderness character. In keeping with NPS policy, the National Park Service ensures no actions are taken that would diminish the eligibility of the area for future wilderness designation, and minimizes traces of modern human use and presence as much as practical to protect the Natural and Undeveloped Qualities. Similarly, the monument identified that creating a formal trail network in the backcountry would be counter to maintaining the landscape as natural and unaltered as possible. Desired conditions for backcountry visitor experience include “recreation in a natural setting that reflects all wilderness values” such as a sense of solitude and remoteness, feeling a separation from the modern world, and a sense of self-discovery. Visitor-created trails would impact those values and the wilderness experience.

This indicator measures the spatial extent (as measured by total linear feet per use area) of visitor-created trails in use areas of the backcountry where visitor use is permitted. By tracking visitor-created trails over time, NPS staff can understand how often these trails are developed, where they are occurring, if they are leading to sensitive resources, and how they are impacting soils and vegetation. As there has been minimal human presence in the backcountry over the last 20 years, the backcountry and wilderness remain largely undeveloped and minimally impacted by modern visitation.

The threshold of 16 feet of visitor-created trail was established based on current conditions of the backcountry use areas. The importance of implementing management strategies quickly when these trails are identified allow for rehabilitation and prevent any related erosion impacts. The established threshold of 16 feet is enough to identify a trampled area as a visitor-created trail, but minimal enough to still be acceptable without major, irreversible impacts to resources and experience.

Monitoring: Primary monitoring would occur throughout the discovery hike season as each guide completes a post-hike report identifying the route taken, sites visited, and any observations. If areas of concern are identified, monument staff would be notified by the guides and additional monitoring would occur. Additionally, annual monitoring would occur in every hiking area. This would be completed by monument staff or volunteers, walking along the general routes used for discovery hikes, throughout the hike area at Pronghorn Plateau, and the .3 miles of the Kaibab Crossing route within monument boundaries. Photographs taken by monument staff or volunteers of the site and a mapping grade (sub-meter positional accuracy) global navigation satellite system (GNSS) device could also be used to identify informal trail development, according to standardized and repeatable protocols developed by the FLAG GIS Specialist. Linear feet would be calculated using GIS software. The FLAG GIS Specialist would manage the visitor-created trail dataset to track current conditions and changes to inform management strategies.

Management Strategies:

- Manage group sizes for all backcountry access.
- Increase spatial dispersion of off-trail, cross-country hikers by discouraging single file where possible.
- Randomize routes, to the extent practicable, for the guided discovery hikes to reduce repeated impacts.
- Reroute hikes so visitors walk the contour along slopes rather than going directly down or up the slope.
- Allow areas to recover by rotating the use of guided discovery hike areas.

- Use abandoned two-track roads as hiking trails for access when present.
- Implement day-use and overnight-use (where applicable) permitting to manage amount and timing of unguided visitors' presence in the backcountry.
- Increase education and awareness of Leave No Trace principles.
- Develop key hike orientation messaging about the development and impacts of visitor-created trails, as well as ways to minimize impacts in the backcountry to be delivered by discovery hike guides.
- Assess visitor-created trail(s) to determine possible reasons for establishment—e.g., does it lead to a desired vantage point or site? Based on results, consider adjusting hiking routes to direct visitors to appropriate areas where the desired experiences could be provided.
- Assess and document the fragility and vulnerability of resources being impacted where visitor-created trails are occurring. If a resource being impacted is determined to be an outstanding feature, take appropriate adaptive management actions such as seasonal site closures or permitting systems to manage the amount of use that occurs in the area.

Adaptive Management Strategies

- Remove locations (specific sites or areas altogether) from the list of eligible guided discovery hike areas until efforts to stabilize and recover are successful. Over time, assess if and when the area or site may be reopened to visitation.

INDICATOR TOPIC: SPATIAL EXTENT OF BARREN CORE AREAS

For Pronghorn Plateau

Indicator: Total area within Pronghorn Plateau with compacted soils, devoid of vegetation and organic materials due to human use (i.e., barren core area).

For All Other Discovery Hike Areas

Indicator: Spatial extent of individual barren core areas.

For All Analysis Areas

Threshold: No single barren core area greater than 6 ft² within 50 feet of high visibility sites (e.g., Navajo hogans, prehistoric masonry structures, petroglyphs, sites with highly visible artifacts).

Rationale: Like visitor-created trails, the barren core area indicators are related to the issues of vegetation trampling, soil compaction and loss, and erosion, as well as to visitor experience. Barren core areas are two-dimensional (polygonal) areas with compacted soils that are devoid of organic materials due to human use of the site (Glidden, 2005). Impacts are similar to those of visitor-created trails, but often the cause is closely linked to overnight use and campsite disturbance from visitors and tents in a concentrated area. Barren core areas can also occur where visitors congregate for a time, such as during an interpretive program at an archeological site.

While barren core areas in the backcountry are not a problem at present, there are some areas of concern that have been identified by WUPA staff, though the concerns vary among use areas. Foremost, Pronghorn Plateau, which is the only new use area with the potential for camping, has been identified due to concerns that devegetation could occur if tents are repeatedly set up in the same area. However, WUPA natural resource staff selected this area as an appropriate overnight

visitor use in part because of the level terrain, resilient soils, and common vegetation where overnight use would most likely occur. Presumably, therefore, impacts to soil and vegetation should not be severe. Nevertheless, impacts to soils, and visitor experience from the loss of vegetation are still important to monitor and manage related to the desired conditions that “functional soils, healthy vegetation, and natural geomorphic process deter unwanted erosion or deposition” and that the landscape is “predominantly natural, undeveloped and untrammeled, protecting wilderness character.”

The threshold for Pronghorn Plateau is different than the other discovery hike areas to allow for an acceptable level of impacts from overnight use. This threshold recognizes that camping would likely lead to a certain amount of soil compaction and vegetation loss under and around tents. The average size of a two-person tent footprint was used to identify the 31 ft² threshold for Pronghorn Plateau. The other areas in the Discovery Hike Program provides an experience with expert guides who provide interpretation of the backcountry’s natural and cultural resources. The threshold for these areas was identified based on the potential for groups to congregate around key sites as interpretation occurs, which can lead to a barren core area becoming established, impacting the area’s geomorphology, and potentially harming the site.

Monitoring:

Primary monitoring would occur throughout the discovery hike season as each guide completes a post-hike report identifying the route taken, sites visited, and any observations. If areas of concern are identified, resource staff would be notified and additional monitoring would occur. Additionally, annual monitoring would occur in *every* hiking area to ensure all sites are monitored. Monitoring would be conducted by monument staff or volunteers who would photograph the site and use a mapping grade (sub-meter positional accuracy) GNSS device to map the boundary of the barren core area as a polygon, according to standardized and repeatable protocols developed by the FLAG GIS Specialist. Site size would be calculated using GIS software. The FLAG GIS Specialist would manage the barren core area polygons in a dataset to track current conditions and changes to inform management strategies. This software should provide the spatial extent of the total area considered to be a barren core area.

For Pronghorn Plateau, the sum total amount of barren core areas within the use area will be categorized by the following scale:

- 1: absent (<6 ft²);
- 2: 6-12ft²;
- 3: 13-31ft²;
- 4: >31ft²

Using this system accounts for some minimal variability in measuring among monitors, while still informing WUPA staff of any increases in barren core area approaching the threshold of level 4 or 31 ft².

For all other visitor use areas in the backcountry, where the size of the barren core area is being monitored in relation to its proximity to high visibility cultural resource sites, such as prehistoric masonry structures or Navajo hogans, GPS measurements would not be summed and any observable barren core area would be measured.

Timing for annual monitoring would be determined by resource specialists when it is easiest to detect and monitor changes in barren core areas.

Management Strategies:

- Manage the number and size of groups for all backcountry access
- Designate specific camping areas where rotation could occur.
- Within the designated camping areas, require/encourage campers to spread out for all overnight use at Pronghorn Plateau to reduce impacts from repetitive use at any one location.
- Alternate which locations on the plateau are considered for designation as camping areas.
- Consider reroutes to avoid impacts to sensitive cultural resources and rotating where guided groups gather for interpretation of sites during guided discovery hikes.
- Alternate the use of discovery hike areas to allow resources to recover.
- Consider temporary area closures in response to rain events to reduce impacts to highly erodible soils and sensitive vegetation.
- Provide additional education to discovery hike guides about concerns over barren core areas and how to deter their establishment and/or expansion.

Adaptive Management Strategies:

- Alternate use areas until efforts to stabilize/recover are successful.
- Remove locations (specific sites or areas altogether) from the list of eligible guided discovery hike areas until efforts to stabilize and recover are successful. Over time, assess if and when the area or site may be reopened to visitation.
- Consider lowering group size numbers under the following conditions:
 - Immediately following a rain event to reduce impact on wet and erodible soils.
 - Where geographic constraints or other resource conditions would cause larger groups to disperse off trail, increasing the potential for expanded barren core areas.

Rationale Common to Both Visitor-Created Trails and Barren Core Areas. A major consideration in selecting both visitor-created trails and barren core areas as indicators for the backcountry, is how visitor presence in the backcountry can impact the stability of an area or site and compound impacts from natural processes. Wind, water (deposition or erosion), vegetation cover, soil type, gradient, and precipitation are just a few of the many non-visitor related factors at work. Among these, erosion is a specific concern because studies have found that erosion can be considered a “significant irreversible form of impact,” leading to “ruts that intercept and transport greater volumes of water, accelerating further soil erosion and altering natural patterns of water runoff” (Marion, Leung, and Nepal 2006 p. 40; Marion, Wimpey, Arredondo, and Meadema 2019).

It occurs primarily from wind or water that cut into sites, move soils, and destabilize landscapes and vegetation. Wind and water erosion can also destabilize cultural sites: wind frequently uncovers new archeological features and artifacts or covers previously exposed ones. As climate change continues to change weather patterns and affect the severity of seasonal conditions (e.g., the duration and amount of rainfall in monsoon season), naturally occurring erosion will continue to be an active influence on the backcountry landscape.

Visitor use in the backcountry and eligible wilderness has the potential to exacerbate natural erosive processes if not properly managed. Monument staff monitor many factors related to natural and cultural resource conditions in the backcountry. Including monitoring for the presence of visitor-created trails and barren core areas in this plan, however, allows for evaluation of impacts directly related to visitors’ presence in the backcountry. Visitor-created trails and barren core areas are of more concern on some soils than others. In the Wupatki backcountry, protecting cinder layers that

support water retention is very important in promoting vegetation cover (which can be an indicator of surface stability). Additionally, certain soils, for example more coarse-grained or gravel soils, are more resilient to visitor use. National Park Service management selected areas for visitor use with more resilient soils. Overnight visitor use, which could occur on Pronghorn Plateau where aeolian processes are more prevalent, is of particular concern for barren core areas, as tents and group congregation over an extended period of time could pulverize the existing cinder into smaller cinders, blowing out over the area, exposing older terrain and creating or enlarging a barren core area. Soil erosion due to the development and use of social trails displaces, destabilizes, and compacts soils, which can expose cultural resources, rocks, and plant roots, and prevent the diversion of water, potentially leading to rills and gullies, affecting the overall landscape.

Related Monitoring:

Any indication of erosion related to visitor-created trails in the backcountry, such as rilling, gullying, or if the visitor-created trail becomes more pronounced and distinct (i.e., it begins to look like a single-track trail, deepening/widening) would lead to management action. Monitoring and measuring soil erosion along visitor-created trails is a challenging aspect of any trail condition assessment, so while erosion monitoring is not an established indicator and threshold in this plan, monitoring it would be important for ongoing resource preservation and implementation of management strategies.

INDICATOR TOPIC: ARTIFACT DISPLACEMENT

Indicator: Number of collection piles per visitor use area.

Threshold: Two collection piles per site over the course of a hiking season.

Trigger: One collection pile in any location in the backcountry.

Rationale: Wupatki National Monument was set aside for the protection and preservation of the thousands of archeological sites of historic, ethnographic, and scientific significance. Damage to and loss or movement of cultural resources, including the thousands of sherds and other historic and prehistoric artifacts located in the monument backcountry is a primary concern for managers. Cultural resources staff have articulated the desired condition that all cultural sites in the monument “are stable and preserved,” that these sites continue to “contain important physical traces of the cultures, communities, and families that made their homes in the Wupatki landscape,” and that “human impacts are anticipated and minimized.”

Artifact theft and displacement are major concerns at the monument, though the extent of the impacts is unknown. Frontcountry areas have experienced losses in artifacts, generally attributed to visitors removing them. NPS staff have not been able to comprehensively track artifact removal and theft by visitors because of the difficulty of monitoring it; however, the monument has some data on the number of artifacts returned to the monument after being taken by visitors, which are often referred to as “remorseful returns” (Gallenstein 2020). Around 65 packages or letters with artifact returns to Wupatki National Monument have been recorded since 1995. Law enforcement also has records of Archeological Resources Protection Act (ARPA) violations and other citations. Since tracking began in 2013, 85 closure violations (entering closed areas and afterhours entry) and 68 cultural resource violations have been recorded.

Artifact theft directly threatens the integrity of archeological sites. It has been identified as an ongoing problem at Wupatki National Monument and NPS staff continue to monitor and implement strategies to deter such behaviors, including educating visitors on Leave No Trace principles and keeping certain areas with sensitive resources closed to the public. Monument staff observe individual artifacts disappearing from sites, but it is generally difficult to attribute those disappearances to a person taking the artifacts. Artifacts can also be displaced by wildlife, wind, water, or soil erosion, which are not connected to human use.

Over the last 25 years, the National Park Service has worked to collect data, monitor conditions, and implement management strategies and policies to protect resources within the monument. Since the mid-1990s, Wupatki National Monument has conducted archeological site condition monitoring informed by the NPS Cultural Resource Inventory System (CRIS) that collects data related to archeology, cultural landscapes, historic structures, and ethnographic resources. This system allows for inventorying and monitoring of the resources. In 2020 monument staff also conducted site vulnerability assessments that examined measures of portability, visibility, fragility, and accessibility of resources. Outcomes from these assessments informed actions and locations included in this plan. NPS staff also developed monitoring under the 1999-2001 Visitor Experience and Resource Protection Framework (VERP) and a Climate Change Response Strategy. Further, they use the Flagstaff Area Monuments Archeological Site Monitoring Program, which addresses requirements for CRIS, as well as additional monitoring identified by resource staff, to guide monitoring and cultural resource protection. NPS law enforcement also monitors for theft.

Because artifact removal cannot always be directly related to visitor use, collection piles are another method to monitor artifact displacement. While the creation of collection piles is a more acute and less harmful impact than artifact theft, monitoring collection piles as the key indicator of visitor impacts to cultural resources for this plan allows for direct measurement and documentation related to visitor use. Artifacts gathered into piles indicate that visitors are picking them up, handling them, and displacing them. The most direct threat of collection piles is a continuation of the behavior, that other visitors will add to the collection pile, and the possibility of more visitors pocketing artifacts from assembled collection piles. Monitoring of any and all impacts to resources inform NPS managers, who use their professional judgment to take management actions as necessary to address the issues.

For the purposes of this plan, a collection pile is defined as any assemblage of two or more artifacts that appear to have been moved and placed together. Collection piles occur when visitors pick up artifacts they come across, gathering several together, and then leave them behind in a pile. As mentioned above, frontcountry archeological sites that are widely accessible to visitors have previously been compromised from these visitor collection activities and artifact theft continues to be a problem. Similar disturbances to backcountry cultural resources would negatively impact the integrity of individual archeological sites as well as the integrity of the larger National Register of Historic Places listed archeological historic district that encompasses the entire monument. Even if visitors do not remove artifacts outside the monument, the act of moving individual artifacts from their original locations results in a loss of context and any temporal and cultural information that could have contributed to research of the site and associated peoples, and continued national register eligibility. Cultural resources are considered nonrenewable and therefore cannot recover from human-caused disturbances; any damage to a resource's or site's integrity is difficult, if not impossible, to reverse.

Additionally, disturbances to cultural resources can impact the visitor experience in the backcountry and eligible wilderness, specifically related to opportunities for solitude and the other features of value quality of wilderness character (identified as Wupatki National Monument's unique archeological record), as well as an overall understanding and interpretation of the history of the site. Providing visitors with a sense of the past through encounters with these resources is a desired condition for visitor use areas in the backcountry. The monument's desired conditions acknowledge that prehistoric and historic archeological sites can be influenced by the cycles of natural process, while other impacts—such as those from visitors—are anticipated and minimized. Balancing visitor use with resource protection to achieve these desired conditions will require monitoring the movement of and any related damage to resources through collection piles and other ongoing assessment methods as described above.

Consideration of the portability of resources informs the vulnerability of sites. Portability is related to the ease of removing artifacts from the site, and how sites with an abundance of surface artifacts are, in general, more vulnerable than others. While it is difficult to directly monitor theft and human-caused movement of such small resources, the presence of visitor-created collection piles can indicate a threat, prompting management strategies to protect the area.

Monitoring and assessing cultural resource conditions in the Wupatki National Monument backcountry is already a high priority for the National Park Service. NPS staff conducts vulnerability assessments, archeological site monitoring, and site steward monitoring, collecting an abundance of data on resource conditions and tracking changes over time.

Monitoring:

Monitoring collection piles under this indicator would occur primarily at sites with high vulnerability due to visibility, type(s) of cultural material present, and overall condition where visitation has occurred in the last 12 months (i.e., at least one discovery hike to the area occurred) and other areas as defined by the FLAG resource and interpretation staff. Baseline conditions would be identified before the implementation of this plan. Monument staff would use current monitoring forms and note collection piles and locations with GIS. Additional monitoring would be done by archeologists, law enforcement, and volunteer site stewards. A comprehensive monitoring plan would be completed to support the implementation of unguided access.

The project team deemed that the use of a trigger for this indicator was vital due to the importance of the preservation of cultural resources per the monument's purpose and enabling legislation. The 1924 presidential proclamation states that "public interest would be promoted by reserving these prehistoric remains." Further, the 2015 Foundation Document explicitly outlines that the purpose of the monument is to "preserve and protect thousands of archeological sites scattered across the stunning landscape." Considering the sensitive nature of archeological resources and their direct connection to the monument's establishment and purpose, any evidence of artifact removal or movement is a problem that should be addressed. Thus, every newly recorded collection pile is cause for concern and would result in additional resource staff efforts to educate visitors and protect remaining in situ cultural resources. The trigger for this indicator would prompt a management response to ensure that desired conditions continue to be maintained before the threshold is crossed.

Adaptive Management Strategies when the Trigger is Met:

- Temporarily close locations (specific sites or areas altogether) to visitor use to allow for resource specialists to examine the area and analyze impacts. Document collection pile, then disperse it.
- Increase emphasis on orientation and education about Leave No Trace principles, the impacts to the resources and history from moving or collecting artifacts, and the responsibility of each visitor to protect the cultural resources in the backcountry.

Management Strategies:

- Manage group sizes for all backcountry access.
- Document and disperse collection piles when found.
- Increase education on the website and other digital media, as well as during the orientation and throughout the discovery hikes, about Leave No Trace principles and the impacts of moving or collecting artifacts.
- Require all visitors to the backcountry and eligible wilderness to review information on Leave No Trace principles and wilderness ethics prior to joining a discovery hike or obtaining a permit. This could be through mixed media (online video, brochure sent through mail, etc.).
- Conduct artifact inventories.
- For discovery hikes, increase the in-person, pre-hike orientation and education on Leave No Trace principles and wilderness ethics before embarking on the hike.
- Encourage alternating or selecting sites that vary by season.
- Reevaluate discovery hike standard operating procedures (SOPs) as necessary related to use of artifacts in interpretation (e.g., picking them up to show visitors).

Adaptive Management Strategies:

- Remove locations (specific sites or areas altogether) from the list of eligible guided discovery hike areas until efforts to stabilize and recover are successful. Over time, assess if and when the area or site may be reopened to visitation.
- Access would be guided only, from formerly unguided and guided.

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APPENDIX D: VISITOR CAPACITY IDENTIFICATION AND STRATEGIES FOR IMPLEMENTATION

VISITOR CAPACITY OVERVIEW

This appendix provides information about the visitor capacity identification as it relates to the visitor use management framework.

Broadly speaking, visitor use management (VUM) is the proactive and adaptive process of planning for and managing characteristics of visitor use and its physical and social setting, using a variety of strategies and tools to sustain desired resource conditions and visitor experience. Within this framework, desired conditions, indicators and thresholds, and management strategies have been developed as part of this backcountry management planning effort. Another component of the VUM framework is the development of visitor capacities. Visitor capacity is a component of visitor use management defined as the *maximum amount and types of visitor use that an area can accommodate while sustaining desired resource conditions and visitor experiences, consistent with the purpose for which the area was established*. Visitor capacities inform management strategies that keep use levels within the identified number. This visitor capacity identification is also directed by legal mandate in the 1978 National Parks and Recreation Act, which requires that national parks address capacity in planning by defining capacities for all areas of the park unit. Depending on a unit's needs and characteristics, capacities can be developed unit-wide or based on specific areas or zones. Because this is a backcountry management plan, the capacity analysis focuses on the areas of the monument considered to be in the backcountry, the vast majority of which is in eligible wilderness. Because of the critical need to protect and preserve eligible wilderness and other backcountry lands in Wupatki National Monument, a detailed analysis has been conducted to identify the appropriate level of use for *all* areas of the backcountry.

A primary goal of this planning effort is to preserve the fundamental resources and values of Wupatki National Monument. The monument's 2015 foundation document identifies these as the archeological resources and the natural setting/wilderness. Wupatki National Monument was first set aside per presidential proclamation in 1924 to "reserve these prehistoric remains... together with as much land as may be necessary for the proper protection thereof" (NPS 2015, p.25). The foundation document further emphasizes resource protection, stating that the purpose of the monument is "to preserve and protect thousands of archeological sites scattered across the stunning landscape of the Painted Desert and the grassland prairies..." (NPS 2015, p.4). By managing the amounts and types of visitors in the backcountry, NPS staff can work to ensure that monument resources are preserved, while fulfilling the NPS mission to provide for the enjoyment of this and future generations.

Additionally, Wupatki National Monument completed a wilderness eligibility assessment in 2013 that determined approximately 96.5% of the monument is eligible wilderness. This includes almost the entire Wupatki backcountry. Therefore, the preservation of wilderness character, including its five qualities—untrammeled, natural, undeveloped, solitude or primitive and unconfined recreation, and other features of value—is an important consideration in this planning process (NPS *Management Policies* 2006, 6.3.1). Most specifically for Wupatki National Monument, the natural, undeveloped, and other features of value qualities have been considered in relation to sensitive natural and cultural resources present throughout the landscape, and the solitude or primitive and unconfined recreation quality has been important for visitor experience.

The majority of the Wupatki backcountry has been closed to unguided visitor entry under management zoning outlined in the monument's 2004 GMP. Under the closure, access is limited to individuals who have permits granted for research or tribal access, or visitors taking part in NPS-guided activities. NPS leadership determined that closure of the backcountry was the best course of action to protect the resources for which the monument was established from further harm. Since 1996, access to the backcountry has required a guide or, for traditional or research purposes, a special use permit. Following the recommendation from the 2004 GMP that the closure continue, monument staff, the region, and NPS leadership determined that the closure of wilderness eligible and backcountry areas will be made permanent through rulemaking for the purpose of resource protection. Because of this continued emphasis on resource preservation, monument staff would adopt a cautious approach to increasing and/or introducing new visitor uses at Wupatki.

Through this planning effort, Wupatki National Monument has an important opportunity to proactively safeguard the highly valued cultural and natural resources. These include intact prehistoric pueblos, historic structures, cultural landscapes and viewsheds, rock writings, and the beautiful natural landscapes of the monument, as well as the unique visitor opportunities to encounter and learn about them. While the backcountry closure will remain in effect, this plan provides for an overall increase in access to the backcountry and eligible wilderness for Wupatki National Monument's visitors, as well as new opportunities to experience solitude.

The visitor capacities will be used to inform management strategies for these sites as part of the backcountry management plan. For each analysis area, an overview of the setting and relevant existing direction and knowledge, such as visitor use issues, and current use levels are described. The limiting attributes that most constrain use are then identified and analyzed and the visitor capacity is identified. Current use levels have been informed by relevant studies, data, and observations. Visitor capacity identifications vary between the alternatives depending on visitor access and uses for that alternative. For instance, if in one alternative a site or area is closed to visitor use, the capacity identification is zero and no use is authorized under that alternative. In the other alternative, that site or area may be expanded with additional access, therefore resulting in a visitor capacity identification different than current use levels.

Visitor capacities can be defined in a number of ways, including people per day (PPD), which refers to the total number of people who can be in an area over a 24-hour period and is used when resource conditions and preservation are of primary concern. The total number of people an area can accommodate over a year can also be a capacity. This appendix employs several different measures to best identify the capacity and inform implementation and management.

The visitor capacities will be implemented as part of this backcountry planning effort. Specific management strategies that will be used to implement the capacities have been included in the identification. Visitor use levels will be monitored and if they approach or exceed capacities, additional management strategies would be implemented.

This appendix outlines the considerations and process used to identify visitor capacity for key areas in the backcountry and strategies for implementation.

PROCESS FOR IDENTIFYING VISITOR CAPACITIES

Visitor capacities were identified using best practices, data, and contributions from resource experts. The approach for developing visitor capacities is based on the Interagency Visitor Use Management Council's Visitor Use Management Framework and associated publications and is consistent with the literature and best practices on this topic (for a full description of the Interagency Visitor Use Management Council's (IVUMC) Framework and additional resources, please visit the following website: <https://visitorusemanagement.nps.gov/VUM/Framework>).

Through a three-day virtual workshop and several conference calls, the interdisciplinary project team used the recommended process for identifying visitor capacity: 1) determine the analysis areas, 2) review existing direction and knowledge, 3) identify the limiting attribute, and 4) identify visitor capacity. This team considered all potential attributes that would constrain each area's ability to accommodate use and determined which were most meaningful for guiding the analysis.

Guideline 1. Determine the Analysis Area

This guideline involves identifying where the visitor capacity will be implemented. For the Wupatki backcountry (including eligible wilderness), seven geographic analysis areas were identified and analyzed based on use type and management. These analysis zones are not the same as the management zones (discussed in chapter 2), with one exception: to meet the statutory requirement for visitor capacity for *all* areas of the monument, the Resource Preservation Zone (which does not allow visitation) was identified as its own analysis area.

The seven analysis areas, which are shown in figure D-1, are:

1. The Resource Preservation Zone (no visitor use)
2. Crack-In-Rock Guided Overnight Discovery Hike Area
3. Kaibab House and Kaibab House Extended Guided Discovery Hike Area
4. Antelope House Guided Discovery Hike Area
5. East Mesa Guided Discovery Hike Area
6. Pronghorn Plateau Discovery Hike Area
7. Kaibab Crossing Discovery Hike Area: Area within NPS boundaries

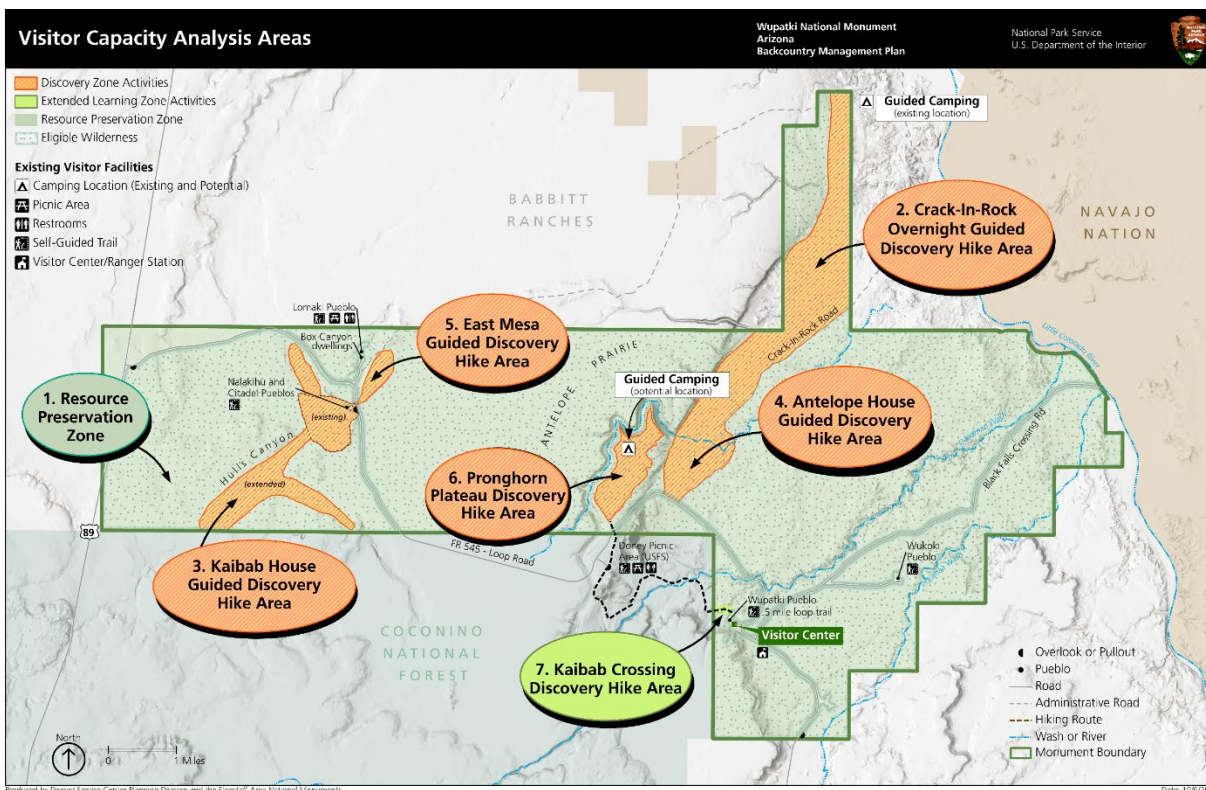


Figure D-1. Visitor Capacity Analysis Areas

Guideline 2. Review of Existing Direction and Knowledge

A review of existing direction and knowledge of the area includes reviewing applicable law and policy, prior applicable planning and guidance, existing conditions, existing monitoring, and applicable existing management strategies and actions. This also included relevant desired conditions for both resources and visitor experiences in the analysis areas.

The amount, timing, distribution, and types of visitor use in Wupatki National Monument influence both resource conditions and visitor experiences. Since its establishment in 1924, visitation to the monument has increased from only a few hundred visitors per year to averaging around 210,000 annually over the past 10 years. Wupatki National Monument is not considered to be a “destination park,” as many visitors stop by the monument as part of a larger visit to all three Flagstaff area monuments or on their way to other sites in the area (e.g., Grand Canyon National Park) and visitation numbers have remained fairly consistent over the last several decades. Over the last 10 years, average monthly visitation to frontcountry areas of the monument has been highest June-September, with around 26,000 each month. December through February had the lowest average visitation, with an average of fewer than 7,000 visitors each month. Most visitors arrive via private vehicle, but many also come via commercial bus tours. These visitors primarily stay in frontcountry areas, close to parking lots and roads, and visit the stabilized sites such as Wupatki Pueblo, Wukoki, and Lomaki Pueblo and Box Canyon Pueblos.

To identify the appropriate amount of use for each analysis area, planning team members reviewed data to understand current conditions compared to desired conditions. Visitation data is collected annually by the National Park Staff to track levels of visitor use monument wide. Additionally, as

current access to the backcountry is only allowed in the Discovery Zone, reports with the number of participants in each guided discovery hike (GDH) are made after every hike.

After the 2013 wilderness eligibility assessment and determination that the vast majority of the backcountry is eligible wilderness, monument staff have followed NPS management policy regarding wilderness resource management (NPS *Management Policies* 2006, Ch 6.3.1). This policy requires that “in addition to managing these areas for the preservation of the physical wilderness resources, planning for these areas must ensure that the wilderness character is likewise preserved (p. 80).” Additionally, management policy states that “the National Park Service will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed,” and that “until that time, management decisions will be made in expectation of eventual wilderness designation (p. 80). Thus, the process for identifying visitor capacity in the Wupatki backcountry and eligible wilderness considered policy related to wilderness management and limiting attributes that would impact wilderness values in the analysis.

Primary visitor use issues are related to concerns of potential impacts on the thousands of cultural resources present throughout the backcountry, as well as sensitive natural resources, including arid grasslands and desert terrain that are vulnerable to erosion, the local pronghorn population, and nesting raptors. Because of the unacceptable impacts that occurred in the 1990s (described above), the backcountry was closed to all unguided visitor access. For this reason, the National Park Service would approach new or expanded uses in the backcountry incrementally and with an emphasis on monitoring, mitigation, and adaptive management. Crowding is not a major concern for Wupatki. A visitor use survey conducted in 2018 found that more than 93% of visitors felt “not at all crowded” or only “slightly crowded” during their visit (Budruk, White, and Sampson 2018).

Although the backcountry has been closed to unguided use, monument staff continue to monitor impacts from unauthorized access to archeological sites. Impacts to Wupatki National Monument’s archeological sites are logged into the Cultural Resources Inventory System (CRIS) and on the monument’s local database, FLAGARCH, and have reported a variety of impacts from authorized use and general visitation as well as unauthorized visitation, vandalism, and unauthorized collection of artifacts. In 2017, the CRIS database showed that in total, 8.3% of Wupatki National Monument’s over 2,700 archeological sites showed impacts from visitation-related disturbances. Many of these impacts occur in the frontcountry areas, but with additional uses and access, there is concern that visitation-related disturbances may increase in the backcountry. Managing capacities and monitoring selected indicators will support resource protection from visitation-related causes. The 2018 visitor use study by Arizona State University did not examine any visitor-caused impacts to monument resources.

In 2020, cultural resources staff from Flagstaff Area National Monuments, which includes Wupatki National Monument, conducted vulnerability assessments for all current and proposed visitor use areas in the backcountry to better understand the resources and to analyze their vulnerability to human impacts. These assessments examined seven elements to identify the level of vulnerability for each site. These elements are: the *visibility* of the site from a distance; the site’s *accessibility* or the degree of difficulty to approach the site; the *fragility* of the site including its geomorphology, slope and erosion; the *portability* or ease of removing artifacts from the site; the level of already-existing *human disturbance(s)* which can expose otherwise buried artifacts or features to other disturbances; the *architectural features* of the site, including free-standing walls or rubble; and finally, the *presence*

of human remains. The outcomes of these assessments support the proposed action and the measured approach to increasing visitor access in selected areas of the backcountry.

Guided Discovery Hike Program: Existing Direction and Knowledge Common to All. The following section includes information pertinent to each of the day-use GDH areas (analysis areas 2–5). Kaibab House, Antelope House, and East Mesa use the same standard operating procedures (SOP), which are important elements of the existing direction and knowledge for each area. The Crack-In-Rock hike also uses the SOP, though there are a few additional Crack-In-Rock-specific procedures that are included in the analysis below. Relevant elements of the SOP are summarized here to remove redundancies within each of the GDH analysis area.

Currently, the maximum number of hikers permitted for each hike is fifteen, including required NPS staff or volunteer guides. Visitors on these hikes are provided with the opportunity to connect with the remote backcountry of the monument. None of the guided discovery hikes are to be scheduled on two or more consecutive weekends, requiring a minimum of a one-week rest between hikes. Historically, these hikes have occurred seasonally on weekends between November and March, though due to inclement weather, hikes in December through February sometimes do not occur. To participate in any of these hikes, interested parties must call the Wupatki Visitor Center to sign up on a first-come first-served basis. Visitors can reserve up to four spots on a hike and a 5-person waiting list is kept in case of cancellations.

Guides for these hikes educate visitors in Leave No Trace (LNT) principles and are trained to minimize impacts to visited sites. One important requirement for participants is that they not bring any GPS devices on the trip so they cannot record the locations of sensitive resources. The use of a GPS device by visitors is grounds for immediate cancellation of the hike. After each hike, staff complete a trip report documenting the number of visitors, the sites visited, and any observed vandalism, suspected changes, or rare/sensitive species.

Guides are required to attend annual field training that includes topics such as site information, sensitive species issues, general resource information, etc. Additionally, guides are required to have training in LNT, interpretation, and safety. The safety training includes use of mobile communication devices, route safety, heat and dehydration illnesses, slips and falls, and hazardous plants and animals.

Access to each of the GDH areas is provided seasonally (see table 1). All the guided discovery hike areas are *closed* to visitor access at all other times and thus, their capacities during closure are zero. The visitor capacity analyses and identifications for these areas in the Analysis of Key Locations below are only for the times when the hike areas are *open* to visitor access.

Guideline 3. Limiting Attributes

Guideline three requires the identification of the attribute(s) that *most* constrains the analysis area's ability to accommodate visitor use. The limiting attribute(s) may vary across the analysis areas and is described under each key area under the heading "Limiting Attribute." Given that use areas can experience a variety of challenges regarding visitor use, there could be more than one limiting attribute. While limiting attributes may vary from one analysis area to the next, the presence of invaluable and irreplaceable cultural resources is a key limiting attribute for every area of the Wupatki backcountry.

Limiting Attributes Common to All Visitor Use Areas (Analysis Areas 2–7). There are limiting attributes that are common across all six analysis areas where visitor use would occur (analysis areas 2–7). Though visitors can be present in these areas, the conservation of natural and cultural resources, and resource protection continue to be the primary management goals across all of them.

Because of the irreplaceable nature of cultural resources and the sensitivity of natural resources, protection of resources is the highest priority across each analysis area in the backcountry, including eligible wilderness. Visitor use access is managed to achieve desired conditions, which prioritize the protection of cultural and natural resources as well as visitor safety and experience. As stated in the introduction, Wupatki National Monument was designated for the protection of the unique cultural resources present across the landscape. While the specific resources within each analysis area and their assessed vulnerability may vary, the overall emphasis on their protection is a primary limiting attribute to accommodating visitor use across these analysis areas. Specific cultural resources are outlined within each capacity analysis below.

Visitor experience is also a limiting attribute for analysis areas 2–7. Desired conditions for visitor experience in the Discovery Zone (which includes analysis areas 2–6) provide for encounters with the unique resources in the backcountry and eligible wilderness and interpretation from NPS-sanctioned guides on discovery hikes. Additionally, desired conditions for both the Discovery Zone and the Extended Learning Zone (analysis area 7) include visitor opportunities for discovery. When groups get too large or there are multiple groups at one time in the same area, it may change the visitor experience by diminishing the remote natural backcountry/wilderness feel and the sense of discovery, and detracts from the intimate experience with the resources. Additionally, groups that are too large are more likely to spread out over the landscape or leave the intended route, potentially damaging cultural resources. Viewing these resources intact is a critical part of a high-quality visitor experience.

Finally, all backcountry use areas have seasonal closures related to natural resource protection and visitor safety (see table D-1). These seasonal closures protect pronghorn movement corridors, pronghorn calving habitat, and rare/sensitive raptor nest cliffs from impacts due to visitor presence. Visitor safety is a limiting attribute because of the extreme conditions that can occur in the backcountry: during the summer months, temperatures can be exceedingly hot, and the late summer monsoon season brings high humidity, lightning storms, and flash flooding. The protection of cultural resources does not vary seasonally and is a priority in each analysis area year-round. Table D-1 specifies the timing for when each analysis area is open or closed to visitor use and summarizes the rationale.

Table D-1. Analysis Area Seasons for Access

Analysis Area	Open Season	Closed Season (Visitor Capacity is 0)	Rationale for Closure
2. Crack-In-Rock Guided Overnight Discovery Hike Area	Months of October and April	November 1 – March 31 May 1 – September 30	Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
3. Kaibab House Guided Discovery Hike Area	October 1 – June 30 Extended Areas is open October 1 to December 31	July 1 – September 31 Extended area closed Jan 1 – September 31	Pronghorn movement and calving season in the Halls Canyon, Ballcourt Wash, and Cedar Canyon areas during the winter and spring. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
4. Antelope House Guided Discovery Hike Area	November 1 – March 31	April 1 – October 31 Seasonal buffer closure from December 1 – July 31 as needed	Pronghorn movement. Seasonal nest cliff buffer closure for rare/sensitive raptors, from initiation of courtship through fully fledged young. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
5. East Mesa Guided Discovery Hike Area	November 1 – March 31	April 1 – October 31	Pronghorn movement. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
6. Pronghorn Plateau Discovery Hike Area	September 1 – November 30	December 1 – August 31	Protection of raptor nesting and allows for initiation of courtship through fully fledged young. Seasonal Pronghorn movement corridor in the area. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.
7. Kaibab Crossing Discovery Hike Area	September 1 – May 31	June 1 – August 31	Impacts to soils from the August monsoon season can affect cultural resource stability. Visitor and staff safety concerns during the hot summer months and monsoon season include heat exhaustion, lightning, flash flooding. Cultural resource restoration, recovery.

Guideline 4. Identify Visitor Capacity and Implementation Strategies

This guideline involves identifying the visitor capacities and the strategies to implement them. To identify the visitor capacities, outputs from the previous three steps were reviewed to understand current conditions and to identify the maximum levels of visitor use that will maintain and achieve desired conditions for the backcountry. The capacity identification varies by analysis area. A range of management strategies that will be most effective in implementing the visitor capacity are also outlined.

ANALYSIS AND IDENTIFICATION OF VISITOR CAPACITY BY ANALYSIS AREA

The following section presents the analysis for each area, using the process described above. The outcome is the identification of a visitor capacity for each analysis area and associated strategies for implementing the capacity.

Analysis Area 1. Resource Preservation Zone (no visitor use)

Location Overview. The resource preservation zone is the largest management zone in the Wupatki backcountry, encompassing most of its total acreage. Nearly all lands in this management zone are eligible wilderness.

Review of Existing Direction and Knowledge. Wupatki National Monument's purpose is "to preserve and protect thousands of archeological sites scattered across the stunning landscape," and its 1924 establishment legislation identified that preserving Wupatki National Monument would promote the public interest. The lands in the Resource Preservation Zone are managed to provide maximum preservation of these fragile and unique cultural resources, as well as the monument's natural flora, fauna, and geologic features. Resources include desert landscapes and ecosystems that provide habitat for diverse flora and fauna, as well as prehistoric and historic archeological sites with continued cultural and ethnographic importance. Visitor access is not allowed in this management zone, and other access, such as for research or tribal uses, requires a permit.

Desired conditions for the Resource Preservation Zone emphasize the ability for fragile and unique resources to thrive and flourish with little to no human intervention.

Limiting Attributes. The primary limiting attribute for the Resource Preservation Zone is the exceptional quality and concentration of resources present in the area, including archeological and ethnographic resources, paleontological resources, and sensitive wildlife. Ethnographic resources include unique geological features and plant species in the area and are sacred to tribes. This zone provides habitat for sensitive wildlife species, including a pronghorn herd, the Wupatki pocket mouse, several bat species, and rare/sensitive raptors (birds of prey), such as the ferruginous hawk, prairie falcon, and burrowing owl. Certain paleontological resources in this zone are very fragile and one-of-a-kind. A sizeable area within the zone is barren, highly eroded "badlands" terrain, with soft mineral crusts and steep slopes that are easily trampled and damaged. Preservation of these resources is the primary goal of this area and supports the achievement of desired conditions and therefore limits the ability for the Resource Preservation Zone to accommodate visitor use and the impacts they would cause.

Visitor Capacity and Implementation Strategies. Based on the emphasis of the desired conditions for preservation of the resources in this zone and the limiting attribute, the visitor capacity for the Resource Preservation Zone is zero.

The primary management strategy for enforcing the visitor capacity is visitor education on the need for certain areas of the monument to be closed for resource protection. Education and interpretation of these resources at the visitor center or on discovery hikes would allow visitors to understand the importance of the sites and why they are protected. Visitors are also able to readily experience expansive scenic views of these areas as they travel through the monument as well as in all visitor use areas. Additionally, the monument has implemented some engineering strategies to close visitor-created pullouts along road shoulders in order to deter visitors parking along the roadside and entering areas of the monument where they are not permitted. Finally, enforcement is a strategy that the monument uses to patrol and enforce the closure of the Resource Preservation Zone. If persons are found in this zone, rangers will educate them on the closure and use other enforcement tools to keep visitors out of the area, as needed.

Summary. For the Resource Preservation Zone, the current visitor capacity is 0 people. The new visitor capacity would remain the same, at 0 people.

Analysis Area 2. Crack-In-Rock Guided Overnight Discovery Hike Area

Location Overview. The Crack-In-Rock Guided Overnight Discovery Hike area is in the Discovery Zone and located in the northern central area of the monument. This analysis area includes a large portion of the northern “chimney” area of the monument, with bordering lands owned by Babbitt Ranches to the east, north, and west. This area also contains a significant amount of eligible wilderness lands. In the proposed action/NPS preferred alternative, this area has been expanded in the southeast section of the “chimney” area.

Review of Existing Direction and Knowledge. The roundtrip 14- to 16-mile hike to Crack-In-Rock Pueblo and the nearby rock writings is a two-day backpacking trip in an isolated area of Wupatki National Monument. The route includes hiking in and out of washes and hilly areas over loose volcanic cinder, sandstone, and limestone. This hike is highly popular and provides a high-quality visitor opportunity and experience. These experiences include the opportunities to experience dark night skies and natural sounds.

Access to this area requires visitors be on a guided hike with an NPS-approved guide. The Crack-In-Rock hike, which has been offered since the early 1980s, can occur up to eight times per year over each weekend in the months of October and April (see table 1). Hikes begin at the Wupatki Visitor Center on Saturday mornings and return Sunday afternoons. Visitors who are interested in participating sign up on a list several months before the scheduled hike, and the National Park Service determines who will take part through a random lottery. For the last several years, approximately 50% of those who expressed interest were able to be placed on a hike. Participation costs in 2020 were \$75 for each hiker.

Current practice for these hikes is to have three guides for every 12 visitors, for a ratio of four visitors to every one guide so staff can effectively manage and educate the group. Guides are required to have training in resource stewardship, interpretation, and safety (e.g., GPS, illnesses, slips or falls, route safety, radio use), as well as Leave No Trace principles. Additionally, guides maintain regular pre-arranged contact with visitor center staff using a radio or other approved mobile communication device. Having visitors in the Crack-In-Rock area without a guide could lead to dangerous situations, injury, or even death. Visitor safety is important for all park units and Wupatki has additionally emphasized its importance in the desired conditions for visitor experience in the Discovery Zone.

The discovery hike to Crack-In-Rock is currently the only overnight experience offered for visitors at Wupatki, with camping occurring just outside the monument boundary on lands owned by the neighboring Babbitt Ranches. The experience includes interpretation from monument staff and subject experts, as well as education on Leave No Trace and wilderness character. From 2017 to 2020, the National Park Service led five Crack-In-Rock hikes, providing the opportunity for 52 people (including guides) to visit the pueblo. Hikes sometimes did not occur due to low staffing or poor weather.

Limiting Attributes and Relevant Indicators. The two limiting attributes that most constrain the amounts and types of visitor use that can be accommodated in the Crack-In-Rock area are the presence of sensitive cultural resources and visitor safety. Resources in this area include Crack-In-Rock Pueblo, a 12th-century Ancestral Puebloan site located on Crack-In-Rock Mesa, as well as numerous prehistoric and historic archeological sites including rock writings and unique geological features. Preservation of these resources is both a desired condition and included in the establishment legislation of the monument.

Visitor safety is another primary concern. The Crack-In-Rock hike is a very strenuous two-day cross-country hike without a formal trail. It is approximately 14 to 16 miles round-trip, exploring deep into the Wupatki backcountry over rough desert terrain. The hike is at an elevation of approximately 4,500–4,900 feet and portions of the route include hiking in and out of washes and through hilly areas. The hike attracts visitors with a range of fitness levels and abilities and is considered a rigorous hike with minimal shade and sparse desert vegetation. Additionally, the weather can be variable during April and October, with temperatures ranging from quite cool to very hot, and precipitation, including snow, can also occur.

In addition to ongoing, routine monitoring of natural and cultural resource conditions completed by discovery hike guides, in the future, staff will also monitor for cultural resource collection piles, which was identified as an indicator directly related to visitor use in the area (as defined in appendix C), which will be important to evaluate if visitor access is leading to impacts. Additionally, if changes occur in the collection pile indicator, monument staff may need to reconsider visitor education and how the guides are monitoring behavior during the hikes.

Visitor Capacity and Implementation Strategies. Based on a review of existing direction and knowledge, limiting attributes, and desired conditions for the area, monument staff identified that the current use levels for the Crack-In-Rock area could be *maintained*. Therefore, the visitor capacity is 15 people per hike (consisting of up to 12 visitors and 3 required guides), up to eight times a year (four weekends in October and four weekends in April), for a total of up to 120 people per year. For all other months of the year (November through March and May through September), the visitor capacity for the Crack-In-Rock area is zero.

The National Park Service will continue to require visitors to sign up and be selected for spaces on the guided hikes. Guided access on the hikes in October and April will be the only visitor access provided to this area. Education before these hikes begin, as well as interpretation along the way, will highlight the importance of resource preservation, human impact on the landscape, and visitor capacity. Hiking in this area will rotate between specific locations to allow time for areas to rest and resources to recover.

Summary. For the Crack-In-Rock Guided Overnight Discovery Hike Area, the current visitor capacity is up to 120 people per year (managed as one group of 15 people/hike consisting of up to 12

visitors and 3 required guides, up to 8 times a year). The new visitor capacity would remain the same, at 120 people per year.

Analysis Area 3. Kaibab House and Kaibab House Extended Guided Discovery Hike Area

Location Overview. This analysis area includes both the current Kaibab House Guided Discovery Hike and the proposed Extended Area. The current Kaibab House area is located near Nalakihi and Citadel and encompasses the area west and south of those pueblos, including South Mesa and Magnetic Mesa. The Kaibab House Extended Area would expand the Discovery Zone in the proposed action/NPS preferred alternative, including more area northwest into Cedar Canyon and south and southeast into Hulls Canyon and Ballcourt Wash. Beyond the parking area, this analysis area is primarily eligible wilderness.

Review of Existing Direction and Knowledge. This area contains grasslands, interesting geology including Citadel Sink and nearby earthcracks, and expansive scenic views of the canyon, mesas, savannas, and the San Francisco Peaks. The NPS has identified 215 cultural sites in the Kaibab House extended area, with sites varying in size and content. Archeological resources include fieldhouses, enclosures, agricultural features, pueblos, and artifact scatters. Petroglyphs in the area are hidden and difficult for visitors to access. Additionally, old, abandoned roads in both the current hike area and extended hike area in Hulls Canyon are available for use as hiking routes.

Archeological assessments completed by the monument's cultural resources staff found the majority of sites as having low vulnerability to impacts from visitors and identified only about 15% as being moderately or highly vulnerable.

Between 2017 and 2020, the National Park Service led nine Discovery Hikes to Kaibab House, providing the opportunity for 99 people (including guides) to experience the hike.

Limiting Attributes and Relevant Indicators. The primary limiting attribute constraining the amount of use for the Kaibab House and Kaibab House Extended Area is the presence of sensitive cultural resources. There are many cultural resources within the hike area, including hundreds of archeological sites, surface and in situ artifacts, corrals which were likely used by Navajo sheep herders, quarries, and rock writings. The arid setting has preserved these resources for centuries, but they remain vulnerable to artifact collection and could be damaged by even well-meaning visitors that do not realize how fragile the masonry and wood structures can be. Impacts to these sites and resources and the loss of surface artifacts is irreversible and any visitor access to the area would occur in groups small enough to be properly supervised by trained guides to minimize the potential for resource degradation.

Visitor Capacity and Implementation Strategies. Based on a review of existing direction and knowledge, limiting attributes, and desired conditions for the area, monument staff identified that the current use levels for the Kaibab House and Kaibab House Extended GDH area could be *maintained*.

Therefore, under the proposed action/NPS preferred alternative, in which guided hikes could continue both in the current Kaibab House area and in the new extended area, the visitor capacity for the entire Kaibab House GDH area will remain at 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year. This capacity allows for up to 150 people per year in the area. However, this use will be spread out over a larger area (both the current and

extended areas) and over a longer duration than at present, which will reduce impacts to cultural resources and improve the visitor experience. These hikes can occur within the original Kaibab House Discovery Hike Area between October 1 and June 30 or in the extended Kaibab House area from October 1 through December 31. At other times, these areas are closed to visitor use during the pronghorn calving season in the Halls Canyon and Ballcourt Wash area, and the visitor capacity is zero.

Management strategies include requiring *guided access only* to this area and managing the group size for each hike to be a maximum of fifteen people. Visitors must sign up for the hike through the visitor center staff, who manage the list and keep the numbers within the acceptable capacity. Specific hike locations may vary to allow certain areas within this analysis area to rest between uses.

Summary. For the Kaibab House Guided Discovery Hike Area, the current visitor capacity is 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year, for a maximum of 150 people per year. The new visitor capacity would remain the same, at 150 people per year.

Analysis Area 4. Antelope House Guided Discovery Hike Area

Location Overview. The Antelope House Guided Discovery Hike Area is in the central part of the monument, near Antelope Wash and southwest of the “chimney” area that extends north of the Crack-In-Rock Road and west of the Little Colorado River. All of this area is in eligible wilderness, except for the unmaintained road.

Review of Existing Direction and Knowledge. The Antelope House Guided Discovery Hike provides visitors with opportunities to visit Antelope House, a three-story Ancestral Puebloan pueblo located on a mesa top. Additionally, visitors see prehistoric check dams, agricultural sites, interesting geology, and expansive scenic views of the upper Wupatki Basin and Doney Cliffs.

From 2017 to 2020, the National Park Service led seven Discovery Hikes to Antelope House, with a total of 84 people (including guides).

In recent years, conditions around Antelope House have become a concern as the slope around the site has experienced increased erosion. Erosion contributes to soil loss and surface deflation but is not only an issue for natural resources; it can also affect the stability of the pueblo and uncover new artifacts and features, making them more susceptible to displacement, theft, or damage. Additionally, a visitor-created trail is emerging leading towards the pueblo.

Limiting Attributes and Relevant Indicators. The primary limiting attributes for the Antelope House Discovery Hike area are the presence of sensitive cultural resources, including Antelope House and historic sites, and concerns related to erosion and associated impacts on both cultural and natural resources. Preservation of resources is both a desired condition and included in the establishment legislation of the monument. Removal of surface artifacts destroys archeological context and decreases future research potential and should be kept to a minimum to maintain the integrity of the area’s archeological sites. Pueblo masonry is susceptible to damage if visitors are not careful when navigating around surviving structural features.

NPS staff have observed that increasing erosion on the slope near Antelope House has exposed new artifacts and features, leading to potential damage or relocation from visitor use. The erosion is also impacting healthy soils and natural geomorphic processes, both of which are desired conditions.

Changes to the geomorphology of the area surrounding the pueblo from visitor presence could lead to other physical impacts from water/wind to the site that would otherwise not occur.

Visitor Capacity and Implementation Strategies. Based on a review of existing direction and knowledge, limiting attributes, and desired conditions for the area, including threats to resources from increasing erosion, monument staff identified that the current use levels for the Antelope House area were not achieving desired conditions and could not be maintained. Therefore, use levels should be *decreased*.

During the winter season (November 1–March 31), the visitor capacity has been identified as 10 people per day (consisting of 8 people and 2 guides), not to exceed 10 days per year. This capacity allows for up to 100 people per year in the area. From April 1 through October 31, the area is closed to visitor use for resource and habitat protection and the visitor capacity is zero. It should be noted that there may be additional seasonal closures between December 1–July 31 as needed to protect rare and sensitive raptors.

Management strategies include requiring guided access *only* to this area and managing the group size for each hike to be a maximum of 10 people: eight visitors and two guides. Visitors must sign up for the hike through the visitor center staff, who manage the list and keep the numbers within the acceptable capacity. Additional management strategies could include allowing the area to rest between uses, efforts to recover the eroded areas, potentially through avoidance of fragile areas (preferred), and the addition of water bars.

Summary. For the Antelope House Guided Discovery Hike Area, the current visitor capacity is 15 people per day, not to exceed 10 days per year, for a maximum of 150 people per year. The new visitor capacity would be 10 people per day (consisting of 8 visitors and 2 guides), not to exceed 10 days per year, or a maximum of 100 people per year.

Analysis Area 5. East Mesa Guided Discovery Hike Area

Location Overview. The East Mesa Guided Discovery Hike Area is east of Lomaki Pueblo, northeast of Citadel and Nalakihi, and supports the East Mesa Discovery Hikes. All of this area, except the frontcountry parking area, is in eligible wilderness.

Review of Existing Direction and Knowledge. The East Mesa Guided Discovery Hike Area includes a concentration of significant prehistoric sites, including several pueblos and rock writings. Most of these sites are located on mesa tops, though the rest of the area is mostly level. This area provides the opportunity for interpretation related to geology, grassland and juniper savanna, and fire ecology. Additionally, the surrounding areas provide great views of Citadel, Nalakihi, the San Francisco Peaks, Antelope Prairie, and often offer excellent wildlife viewing of pronghorn.

Between 2017 and 2020, the National Park Service led nine discovery hikes to East Mesa with a total of 99 people participating (including guides).

Limiting Attributes and Relevant Indicators. The primary limiting attribute at East Mesa is the concentration of sensitive cultural resources in the area. Some of these sites are more vulnerable to impacts from visitor use due to their fragile nature on erosive soils. Additionally, rock writings and other sensitive resources must be preserved.

Visitor Capacity and Implementation Strategies. Monument staff identified that the visitor capacity for the East Mesa Discovery Hike area could *maintain* current use levels based on existing direction and knowledge, as well as the limiting attributes and desired conditions.

During the winter season (November 1-March 31), the visitor capacity has been identified as 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year. This capacity allows for up to 150 people per year in the area. At all other times of the year (April 1–October 31), the area is closed to visitor use for resource and habitat protection and the visitor capacity is zero.

Management strategies include only allowing guided access to this area and managing the group size for each hike to be a maximum of fifteen people. Additionally, the SOP requirement that the area be used seasonally and allow time to rest, allows for only 10 days of use each year, supporting the identified capacity.

Summary. For the East Mesa Guided Discovery Hike Area, the current visitor capacity is 15 people per day (consisting of up to 13 visitors and 2 guides), not to exceed 10 days per year, for a maximum of 150 people. The new visitor capacity would remain the same, at 150 people per year.

Analysis Area 6. Pronghorn Plateau Discovery Hike Area

Location Overview. In the future, the National Park Service could allow visitor access in a new area of the monument, east of Antelope Prairie and north of Doney Mountain. Monument staff has named this new use area Pronghorn Plateau Discovery Hike Area. All of this analysis area is in eligible wilderness.

Review of Existing Direction and Knowledge. Pronghorn Plateau is a new area of the backcountry that will be opened to visitor use. This area may allow for guided day use, guided overnight use, and/or unguided day use to provide a variety of visitor experiences, while also emphasizing resource protection. Assessments of the vulnerability of cultural resources in the area determined that most resources are of low vulnerability, though 30% were identified as being moderate or high.

The geography of Pronghorn Plateau is a high plateau surrounded by steep drop offs that provide a naturally well-defined area to explore. It is bounded by the Doney Cliffs and deeply incised Antelope Wash and provides visitors with expansive views of the Wupatki Basin to the east, Painted Desert east of the Little Colorado River, south to Doney Mountain, and southwest to the San Francisco Peaks. As visitors will be hiking on a level plateau, visitors get great views for very little physical exertion. This area would not have a defined route or trail and hikers could traverse it how they would like, and many visitors may choose to make a loop along the outer rim where the views are best. In addition to the spectacular views and the visitor experience, this setting provides resilient soils that were an important factor in selecting this area as appropriate for visitor use. Guided overnight activities would increase opportunities for visitors to experience clear nighttime skies and natural quiet, in addition to wilderness qualities including remoteness from sights and sounds of more developed areas.

Archeological vulnerability assessments completed by the monument's cultural resources staff found that about 30% of sites in the area were moderately or highly vulnerable. Visitation would be concentrated on the top of the plateau where the majority of resources are. Guides on discovery hikes at Pronghorn Plateau would instruct visitors to stay on the plateau, and visitors who receive

permits for unguided access, would also be informed of the requirement to stay up on the Plateau for the preservation of the sensitive cliff resources, before receiving their permits.

Two primary factors influence when this area is open to the public. Because the entire area is near important raptor nesting habitat, a closure is in effect on Pronghorn Plateau from December 1 through July 1. This closure is extended from July 1 through August 31 because of safety concerns related to high temperatures and monsoon season. Pronghorn Plateau would be open to the public for the fall season, from September 1 to November 30.

Limiting Attributes and Relevant Indicators. The primary limiting attribute for Pronghorn Plateau is the desired visitor experience in the area. This area was identified as a place where visitors could experience wilderness values such as solitude and primitive or unconfined recreation, and natural quiet, experiences that have not been available in the backcountry for some time. It is also a confined geographic area, being less than 400 acres, so to limit the possibility of visual or auditory impacts from other visitors on the solitude experience, keeping use levels low will be important.

Another limiting attribute is the cultural resources in the area, including sensitive and vulnerable sites. Although natural resources on Pronghorn Plateau are reasonably resilient, cultural resources remain vulnerable if high levels of unguided visitor activities were to take place on the plateau.

Visitor Capacity and Implementation Strategies. Currently Pronghorn Plateau Discovery Hike Area is not open to visitors; therefore, the use levels should be *increased* to accommodate new use. Based on existing direction and knowledge, as well as the limiting attributes and desire to provide opportunities to experience wilderness values, the capacity has been identified as up to 16 people a week, managed as two groups. Specifically, this could include up to six people per group for *unguided* access and up to eight people per group for *guided* access (six visitors and two guides). Pronghorn Plateau would be open to visitor use between September 1 and November 30, and the weekly capacity would be implemented during that time. This capacity allows for up to 224 people per year in Pronghorn Plateau. From December through August 31, this area would remain closed for raptor nesting and pronghorn migration, so the visitor capacity is zero. Locations on the plateau would also rest between use to allow for recovery from visitor use.

This capacity would be implemented through a combination of guided day, guided overnight, and/or unguided day use and could occur both on weekends and weekdays. Unguided use of this area will only occur if monitoring is in place and will be by permit only.

Summary. For the Pronghorn Plateau Discovery Hike Area, the current visitor capacity is 0 people. The new visitor capacity would be 16 people per week during the open season (September through November), managed as two groups per week, up to 224 people per year. Note that the numbers of visitors to guides would vary based on which kind of experience was provided—guided or unguided—but up to 168 visitors and 56 guides could be in the backcountry per season.

Analysis Area 7. Kaibab Crossing Discovery Hike Area: Area within NPS Boundaries

Location Overview. The Kaibab Crossing Discovery Hike Area is a new area of the monument that may be opened to visitor use. This route is an out-and-back hike that connects the Doney Picnic Area on the Coconino National Forest (NF) to Wupatki Pueblo and the Wupatki National Monument Visitor Center. It follows an old roadbed through 3.2 miles of adjacent Coconino NF backcountry and enters Wupatki National Monument just west of Wupatki Pueblo. Because the Coconino NF is open to general recreational use, this analysis area consists solely of the 0.3-mile

section on NPS lands (hereafter referred to as the “area within NPS boundaries”); the capacity identified in this document is only applicable to the monument lands. Most of the Kaibab Crossing Discovery Hike Area is in eligible wilderness, subject to further analysis as part of a future wilderness study.

Review of Existing Direction and Knowledge. This is a new use area where unguided access would be provided. The visitor experience includes stunning views of the San Francisco Peaks, volcanic mesas, Painted Desert, and Wupatki Pueblo. The hike is intended to be moderately challenging but is an easy-to-follow route along an old roadbed and into a wash. At the western end of the hike, the Doney Picnic Area provides trailhead infrastructure including parking, vault toilets, picnic tables, and informational signage. The eastern terminus of the route is located near Wupatki Pueblo and the Wupatki National Monument Visitor Center, which also provides parking, bathrooms, interpretive materials, and picnic tables.

Current use of the route on the adjacent Coconino NF is generally low, the area is open year-round, and there are currently no closures or limitations on visitor use for this part of the Coconino NF. Desired conditions for the Coconino NF lands are consistent with the desired conditions for Wupatki, including preserving cultural sites and scenic values.

Limiting Attributes and Relevant Indicators. The primary limiting attribute for accommodating visitors in the area within NPS boundaries is the presence of cultural resources. The .3 miles on NPS lands is in an area with many vulnerable resources, including a high concentration of artifacts and masonry structures that are of key concern for management. The vulnerability assessments conducted by FLAG staff identified that in the 0.3 miles of the hike within monument boundaries, 65% of the sites were of moderate or high vulnerability. Additionally, the fragility of the area, its slope and soils, and potential for erosion, are primary concerns for affecting cultural resources in the area. Protection of these more highly vulnerable sites must be considered in the identification of a capacity. High levels of visitor use could lead to erosion, which could negatively affect cultural resources by destabilizing sites or uncovering features and artifacts, making artifacts more noticeable and more susceptible to theft or removal. This area is close to busy frontcountry areas that are regularly staffed by the National Park Service, allowing for more staff presence and informal monitoring to occur.

In addition, the visibility of the proposed route from the area around Wupatki Pueblo is also a concern. Hikers along the new route could be visible to visitors near Wupatki Pueblo—one of the most popular areas in the monument—which could encourage unpermitted visitors to follow the route. Thus, managing the number who are permitted to use the route each day to a low number would decrease the likelihood of other visitors seeing hikers accessing the area and venturing where they are not permitted.

Visitor Capacity and Implementation Strategies. Currently the portion of this route within monument boundaries is not open to visitors; therefore, monument staff identified that the visitor use for the area within NPS boundaries would be increased to accommodate new use in the area. Based on existing direction and knowledge, as well as the limiting attributes and desired conditions, the capacity has been identified as two groups of up to eight people twice a week from September 1 through May 31. This capacity as identified in this document allows for up to 640 people per year in the area. This area is closed to access during the summer due to weather and safety concerns for both visitors and NPS staff. Permitting hikes up to two times a week allows the resources to have some

time for recovery and limits the impacts of repeated visitor access. From June 1 to August 31, the visitor capacity for this area is zero.

Implementation strategies include defining the route in places where needed (e.g., minimal wayfinding markers), education about how visitors can access the route; requiring a permit for access; and clear signage, including that a permit is required to access the route when entering Wupatki National Monument from USFS lands (Coconino National Forest).

Summary. For the Kaibab Crossing Discovery Hike Area Wupatki National Monument segment, current visitor use is 0 people. The new visitor capacity would be 16 people per week during the open season (September through May), managed as two groups per week, up to 640 people per year.

SUMMARY OF VISITOR CAPACITY

The following table shows the current and new visitor capacities for all seven analysis areas (table D-2).

Table D-2. Summary of Visitor Capacity by Analysis Area (current and new)

#	Analysis Area	Current Visitor Capacity	New Visitor Capacity
1	Resource Preservation Zone	0 (Closed to protect resources)	0 (Closed to protect resources)
2	Crack-In-Rock Guided Overnight Discovery Hike Area	Up to 120 people per year, managed as one group of 15 people/hike up to eight times a year (96 visitors 24 guides)	Same (120/year max.) (96 visitors 24 guides)
3	Kaibab House Guided Discovery Hike Area	15 PPD, not to exceed 10 days/year (150/year max.) (130 visitors, 20 guides) Includes only existing Kaibab House GDH Area	Same (150/year max.) (130 visitors, 20 guides) Includes both existing Kaibab House GDH and the extended Kaibab House GDH Area in the proposed action/NPS preferred alternative
4	Antelope House Guided Discovery Hike Area	15 PPD, not to exceed 10 days/year (150/year max.) (130 visitors, 20 guides)	10 PPD not to exceed 10 days/year (100/year max.) (80 visitors/20 guides)
5	East Mesa Guided Discovery Hike Area	15 PPD not to exceed 10 days/year (150/year max.) (130 visitors, 20 guides)	Same (150/year max.) (130 visitors, 20 guides)
6	Pronghorn Plateau Discovery Hike Area	0 people	16 people per week (PPW) during the open season (Sept–Nov), managed as two groups per week (224/year max.) (168 visitors and 56 guides)
7	Kaibab Crossing Discovery Hike Area: WUPA segment	0 people	16 PPW during the open season (Sept–May), managed as two groups per week (640 visitors/year max.)

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APPENDIX E: ALTERNATIVES CONSIDERED BUT DISMISSED

Proposed actions in the alternatives must address the purpose and need for the plan. The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act require federal agencies to explore and objectively evaluate all reasonable alternatives and briefly discuss the rationale for eliminating any actions that were not carried forward for further analysis.

- **Unguided day hiking between Wukoki and Wupatki Visitor Center.** This action was included in the selected alternative of the 2004 general management plan. However, the proposed route would impact recently discovered, sensitive resources. Visitors can have a similar, unguided day hiking experience in the monument's frontcountry; other routes with less resource impact potential are included in the proposed action/NPS preferred alternative that duplicate the type of visitor experience associated with this potential route with less impact.
- **Unguided overnight hiking and dispersed camping/backpacking in backcountry areas.** Extended unguided visitor activities and visitor-created campsites would have the potential to impact the fragile archeological sites, historic structures, and culturally important resources found throughout the monument's backcountry through inappropriate visitor activities and trailing. Creation of informal campsites in archeologically rich areas could destroy archeological sites, inspire unauthorized collecting, and concentrate use and human impacts into a small area. Extended stays in the backcountry could disrupt wildlife, create issues with human waste and trash disposal, and require additional monument staff effort for visitor safety and search-and-rescue activities. The potential for these negative effects is greater with unsupervised visitor use than with guided overnight hikes or permitted day use. These concerns were also expressed by Navajo Nation members during tribal consultation and the public outreach process. Unguided overnight opportunities are widely available on other public lands in the Flagstaff area.
- **Developed backcountry campground.** The vast majority of the backcountry is eligible wilderness. This type of concentrated use and development would be inconsistent with NPS management policies related to wilderness stewardship.
- **Opportunities for rock climbing.** The geology present in the Wupatki National Monument backcountry does not support sport climbing.
- **Opportunities for backcountry off-highway vehicle (OHV) use.** In accordance with 36 CFR 4.10(b), routes and areas for OHV use may be designated only in national recreation areas, national seashores, national lakeshores, and national preserves. In addition, this visitor activity would be inconsistent with the monument's management zoning, NPS management policies, and wilderness management.
- **Opportunities for backcountry biking.** Under 36 CFR 4.30 and *NPS Management Policies 2006*, the use of a bicycle is allowed on park roads and in parking areas that are otherwise open for motor vehicle use by the general public. Biking is considered an example of "mechanized transport" and is a prohibited use in the Wupatki eligible wilderness as described in *NPS Management Policies 2006*, Sections 6.3.1 and 6.4.3.3.
- **Opportunities for backcountry equestrian use.** Equestrian use at Wupatki National Monument is limited to paved, public roads where allowed under Arizona law. Backcountry horseback riding would greatly impact vegetation, fragile soils, and in situ archeological

resources by increasing soil compaction, erosion, and trampling. The introduction of horses, their feed, and their waste could also spread invasive plant species throughout the backcountry, creating a threat to native vegetation. Limited water availability in the backcountry could also result in visitor and animal safety concerns.

- **Established backcountry access point/boat landing on the Little Colorado River.** The river's fluctuating and inconsistent water levels make it technically infeasible to create an established access point or constructed boat landing that would successfully limit visitor impacts to the adjacent riparian area and ensure adequate visitor safety.

APPENDIX F: ISSUES AND IMPACT TOPICS CONSIDERED BUT DISMISSED FROM ANALYSIS

Consistent with the 2020 Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1501.9) and guidance in Section 4.2.E of the 2015 *NPS NEPA Handbook*, the NPS used civic engagement and interdisciplinary team discussions to identify important issues to be analyzed in detail in the environmental assessment, and to identify those issues that could be eliminated from further study. This appendix documents those issues and the related impact topics that were considered but then dismissed from further analysis and the reasons why.

PRONGHORN AND PRONGHORN HABITAT

The American pronghorn (*Antilocapra americana americana*) is one of three native ungulate species occurring in Wupatki National Monument. In Arizona, there are three subspecies of pronghorn; American pronghorn is the most abundant of those subspecies and is found primarily in the north-central part of the state where the monument lands lie (Baril et al. 2018; AGFD 2013a). The pronghorn and the grassland ecosystem on which they depend are both identified as key resource values in the 2002 WUPA general management plan/environmental impact statement (record of decision 2004), as well as identified as fundamental resources in the 2015 WUPA foundation document.

One of the largest remaining expanses of pronghorn habitat in Arizona occurs on the Coconino Plateau, and WUPA is located on the eastern perimeter of that expanse. The monument provides protected habitat (no grazing, development, or hunting pressures), and provides range during all seasons (Baril et al. 2018). The greatest concentrations of pronghorn in the monument occur during the winter and spring, and pronghorn are known to consistently use the grasslands west of Doney Cliffs, commonly referred to as Antelope Prairie (see figure 1 for orientation).

The American pronghorn does not have a Species of Special Concern status (i.e., the species is not state or federally listed). The Arizona State Wildlife Action Plan 2012–2022 (2012; SWAP) describes its conservation status as “vulnerable” in the state. The rationale for its conservation status is based on factors such as small populations that are relatively isolated from other state populations due to human-caused disturbance and habitat loss state populations existing at the margins of the species’ entire distribution; and evidence of declining population trend within the state, including the population associated with the monument.

Under the proposed action/NPS preferred alternative, visitation to the backcountry would be expected to increase up to an additional 758 visitors annually (an increase of up to 814 total people, including guides). In places, visitors would be traveling overland and not following a prescribed trail; therefore, there would be potential for increased impacts to pronghorn behavior and their habitat. Ungulates, including American pronghorn, are known to be sensitive to human disturbance, particularly humans on foot (Stankowich 2008), though pronghorn have been observed to assess whether the approaching human in question is a threat based on behavioral cues (i.e., casual or fast approach). Though pronghorn may exhibit avoidance behaviors to visitors during any season, human disturbances can be particularly detrimental during certain critical periods, such as when animals are in poor condition or vulnerable to injury (e.g., drought-stress, pregnancy, calving), and seasonal movement along known corridors between their summer and winter ranges. Because open habitats (e.g., grasslands) have few visual obstructions, encounter distances for pronghorn are long

(as compared to wildlife in forested habitats), and pronghorn have been observed to flush from areas of pedestrian use from up to 100m of observation (Taylor and Knight 2003). Additionally, over time, they are known to avoid what is otherwise suitable habitat if recreational activity is persistent and/or predictable, which equates to less available suitable habitat for as long as the recreational activity is established (i.e., disrupts habitat connectivity and/or seasonal corridor use, diminishes the amount of available suitable habitat). Flushing from suitable habitat comes at the potential negative costs of temporarily abandoning calves (physiological stress responses, protection, nutrition / energetic losses, reduced survival), increasing the amount of energy expended (flight; stress responses), decreasing energy intake for both adults and calves (vigilance; decreased foraging time), and the possibility of animals altogether avoiding otherwise suitable habitat and/or seasonal corridor use due to recreational pressure.

However, as identified by AGFD, the population decline of the Wupatki area population is not attributed to visitor recreational activity within the monument (see Baril et al. 2018, 4.13.4-Condition and Trend). Under the plan, an additional 4,034 acres would be zoned for backcountry visitor use, with an annual maximum of 1,244 visitors (up to 1,384 people including guides). A total of 30,474 acres of total habitat would remain closed, providing ample habitat area for individual animals to evade visitor groups. This equates to a 4.2% change in amount of additional monument acreage available for recreation and a corresponding amount of affected pronghorn habitat within the monument. A small group of visitors in the backcountry once per week in the new access zones may encounter individual pronghorn. The predicted effect is that not more than a few animals would be compelled to move to the nearest habitat area that is screened from pedestrian view.

This plan incorporates measures to protect the pronghorn and its native grassland habitat, especially during calving periods and seasonal movements between summer and winter range, which would eliminate the potential for temporary human disturbance and maintain habitat connectivity when pronghorn are most vulnerable. The through routes for pedestrian access would occur where soils and vegetation are resilient to the levels of activity identified in the plan, and therefore would not affect vegetation cover that provides forage and browse for the animals, or suitable hiding cover for young. Visitor group size would be small, and the amount of time spent in a given area of pronghorn habitat would be infrequent and limited in duration (low intensity visitation).

All of the areas proposed for new access would be closed to all access during the most critical times for pronghorn rearing of young and nearby identified seasonal movement corridors between summer and winter range. As a result, and based on best available information, the available habitat would continue to support the current population of pronghorn found in the monument. Therefore, based on the analysis above, the topic of pronghorn and pronghorn habitat is dismissed from further consideration.

RAPTORS

For raptor wildlife occurring at WUPA, the monument conducts periodic nesting surveys, and maintains monitoring data and reporting for three raptor species: the prairie falcon (*Falco mexicanus*), the golden eagle (*Aquila chrysaetos*), and the great horned owl (*Bubo virginianus*), with the former two species historically treated as species of conservation concern (Baril et al. 2018; see table 4.12.4-2). Through the years of reporting, prairie falcon and great horned owl nests and fledglings have been recorded and monitored in the Deadman Wash area of the monument. The monitoring reports, however, do not indicate that golden eagles have nested within the monument since monitoring began in 1999. Records before 1965 indicate golden eagles nested at Citadel Sink,

and abandonment of the primary nest site coincided with a number of events, including take of a golden eagle in 1943 (followed by no golden eagle observations between 1944 and 1951), then reroute and hardening of the entrance road to the monument in 1954 (Britten 2001). Currently, golden eagles are routinely observed in and over the monument, hunting within the western grasslands and along the Little Colorado River corridor. The routine observations of these species suggest that the habitat within the monument serves as hunting habitat within established territories adjacent to the monument and is adequate to maintain prey species and other resources to sustain golden eagle presence. Monitoring observations also document routine occurrence over the Pronghorn Plateau-Doney cliffs area during the courtship period from early December to early February (raptor monitoring database, Natural Resource Program, Flagstaff Area National Monuments). Sub-adults that have fledged from adjacent territories are also routinely observed soaring over this habitat (raptor monitoring database, Natural Resource Program, Flagstaff Area National Monuments).

None of these raptor species have a Species of Special Concern status (i.e., they are not state or federally listed), though golden eagles are protected by The Bald and Golden Eagle Protection Act. The Arizona SWAP (2012) describes conservation status for the golden eagle and prairie falcon as “vulnerable” in the state, citing stable populations but with evidence of decline. Across their entire distribution, prairie falcon and golden eagle populations are variously reported as “stable, but with evidence of decline” (Steenhof 2020; Kochert et al. 2020, respectively). The Arizona SWAP does not provide a status report on great horned owls, and across its entire distribution, their populations are reported as “robust” (Artuso et al. 2020). Great horned owls are also known to redistribute into areas that have been recently disturbed by human activity where nesting and foraging opportunities present themselves (logging, expanded suburban development, etc.).

In places, unguided backcountry visitors would be traveling over land in remote areas and not following a prescribed trail, thus, there would be potential for increased impacts to raptor behavior and their habitat. Raptor responses to increased presence of people may depend on how individual species react (avoid, attract, tolerate). Within the backcountry, pedestrian disturbance near nesting areas comes at the potential negative costs of adults temporarily abandoning nested chicks (physiological stress responses, decreased protection and nutrition), increasing the amount of energy expended (flight; physiological responses), and decreasing energy intake for both adults and chicks (vigilance; not time spent hunting and feeding).

However, under the proposed action/NPS preferred alternative, an increase of up to 758 additional visitors per year (814 total people, including guides) would be expected in the backcountry and use would be limited in duration. In addition, visitor access would be managed seasonally to facilitate protection of nesting raptors within 0.5 mile of nest sites during those periods when raptors are most vulnerable to disturbance. While impacts to raptors would occur from increased pedestrian use, there would be no impacts during raptor nesting season and other sensitive periods, and while individual birds may be affected, this would not affect current population level of these species. As a result, and based on best available information, the available habitat would continue to support the raptor species associated with the monument. Therefore, based on the analysis above, the topic of raptors is dismissed from further consideration.

FICKEISEN PLAINS CACTUS

The Fickeisen plains cactus (*Pediocactus peeblesianus* var. *fickeiseniae*; “cactus,” “plant”) is a cactus endemic to the Colorado Plateau in Coconino and Mohave Counties, Arizona, whose widely distributed populations are restricted to a very specific type of habitat. The Fickeisen plains cactus is a Species of Special Concern at both the state and federal levels. At the state level, it is protected from collection under Arizona Native Plant Law (Arizona Dept. of State 2016). As of October 2013, the cactus is listed as an endangered species, and critical habitat was designated in September 2019 (USFWS 2016).

This species is identified in the WUPA general management plan (2002) as a “species of concern [...] known from similar habitats nearby the monument [...]”. To date, however, this species has not been encountered inside monument boundaries in habitats identified as appearing suitable (Paul Whitefield pers. comm. 02 Sep 2020), and the US Fish and Wildlife Service did not report a range expansion, or adjustments to the current knowledge of its range in 2020 (USFWS 2020). Further, the Arizona Natural Heritage Program (Arizona Game and Fish Department) surveyed monument lands in past years and did not encounter this species (AGFD 2013b; Paul Whitefield pers. comm 02 Sep 2020).

The USFWS (2016) provides a comprehensive description of cactus habitat, including geology, the relief of the terrain where it is found, soil properties and characteristics, as well as information on survey history and results, and provides location information for where this species is currently known. The critical habitat description also provides a full list of soil classes that are associated with the Fickeisen plains cactus habitat (see table 2 in USFWS 2016), as well as detailed descriptions of associated plant species where the cactus is found.

Specific areas within WUPA exhibit similar elevation (elevation source for WUPA, USGS DEM GIS data) and vegetation characteristics described for the cactus (Hansen et al. 2004). However, the slope, soil properties and characteristics are different for most of the proposed new visitor access areas, except for a very small area within the Pronghorn Plateau, notably differing in the described soils classes listed within the USFWS critical habitat description (compare to USFWS 2016; USDA 2015). Compared to soils information for cactus critical habitat, soils within Kaibab Limestone habitat within the monument are more suitable for grasslands. An even greater distinction is that the monument is much nearer to the San Francisco Volcanic Field, where the soils have considerable amounts of volcanic material, originating from lava flows covering the western half of the monument over the last 3 million years (Billingsley et al. 2007), and volcanic cinder and ash-fall from a sequence of volcanic eruptions over the last 1.2 million years, including nearby Merriam Crater, Doney Crater, Strawberry Crater, and most recently Sunset Crater Volcano, at 1,000 years ago. (Hooten et al. 2001). Any cactus plant populations that occurred within the proposed visitor access areas within the monument would have been too close to the volcanic eruption centers, buried by the ashfall deposits, and extirpated from the habitat (Hooten et al., Billingsley et al. 2007). For this reason, the soil physical and chemical characteristics given for Wupatki most likely do not support the Fickeisen plains cactus occurrences.

As a result of the analysis above, and based on best available information, the topic of the Fickeisen plains cactus is dismissed from further consideration. The monument’s biologists and field botanists will continue to survey for this cactus, and should populations be found, the National Park Service would initiate consultation with the US Fish and Wildlife Service (USFWS) on potential effects on this species.

CAVE RESOURCES (EARTHCRACKS AND BLOWHOLES)

The monument's cave resources include earthcracks and blowholes that formed over the last 65 million years as a result of plate tectonics and volcanic activity (summarized in Baril et al. 2018). More recent and localized fracturing, faulting, and uplift is also likely related to volcanic activity in the surrounding San Francisco Volcanic Field. These forces have created an extensive network of visible fractures and faults in the surface sedimentary rock formations ("cracks"; Pearce 1998 in Baril et al. 2018). The fracture and fissure system is widely interconnected, allowing air currents to move within, driven both by surface and sub-surface temperature differences and atmospheric pressure fluctuations. As a result, air currents "breathe" at unique "blowhole" openings (see Baril et al. 2018).

The earthcrack caves contain some of the most fragile ecosystems within Wupatki, and its ecosystem supports a rare community of cave-adapted species, including three endemic species of blind pseudoscorpions, in addition to other endemic invertebrate taxa (Baril et al. 2018). The caves also provide winter hibernacula for the Townsend's big-eared bat, (*Corynorhinus townsendii*), which is a species of conservation concern for Arizona (AGFD 2012). Additionally, the caves as a geological resource are fragile because of their structural and volcanic configuration along geologic fault lines and necessitate the use of specialized equipment in order to access them.

Known earthcracks and blowholes will remain in the Resource Preservation Zone (see NPS-WUPA 2002), where general visitor access is prohibited, and protected under the Federal Cave Resources Protection Act of 1988 (16 USC 4304 - *Confidentiality of information concerning nature and location of significant caves*). Visitors to the backcountry/eligible wilderness without a guide may present a potential for unintended impacts in remote areas. Backcountry access has been carefully zoned to entirely avoid all earthcrack openings and blowholes, and based on this criterion (zoning), the topic of geologic resources is dismissed from further consideration.

PALEONTOLOGICAL RESOURCES

Fossils are evidence of ancient life and are irreplaceable remnants of geologic history that contribute to the knowledge of past climates, vegetation, and animal communities (invertebrates and vertebrates) extending to millions of years ago. Recent inventory efforts have documented rich and diverse paleontological resources within monument lands, including abundant trace fossils of vertebrate animals (e.g., fossil trackways) that are unique to the Colorado Plateau (Henderek et al. 2017; USDA et al. 2015). These finds add value by offering visitors and scientists opportunities to learn about the ancient history of the Wupatki's landscape (Henderek et al. 2017).

All proposed backcountry access areas would be sited to entirely avoid areas which are known to contain the monument's most important and vulnerable paleontological resources. Based on this criterion (siting access areas), the topic of paleontological resources is dismissed from further consideration.

UNTRAMMELED, NATURAL, AND UNDEVELOPED QUALITIES OF WILDERNESS CHARACTER

During development of the proposed action, the interdisciplinary team discussed potential impacts to the Wupatki eligible wilderness. While some of the activities within the proposed action/NPS preferred alternative appeared to have the potential to affect certain aspects of wilderness character, no actions appear to impact all the five qualities associated with wilderness character management. Through thoughtful discussion, the team decided to retain two of the five qualities of wilderness character for detailed analysis in the plan: opportunities for solitude or primitive and unconfined recreation, and other features of value (cultural resources). The definitions of the three remaining wilderness character qualities and the rationale for their dismissals are included below.

- **Untrammeled.** The Wilderness Act states that wilderness as “an area that generally appears to have been affected primarily by the forces of nature” and “retain[s] its primeval character and influence.” *Keeping it Wild 2*—the updated, interagency wilderness monitoring strategy—interprets this as meaning wilderness is unhindered and ecological systems are free from intentional actions of modern human control such as suppressing fire, stocking lakes with fish, or removing predators (USFS 2015). The National Park Service is not proposing any actions that would intentionally affect the untrammeled quality of the Wupatki eligible wilderness as part of the backcountry management plan. Therefore, this topic was dismissed from detailed analysis.
- **Natural.** *Keeping it Wild 2* describes natural quality of wilderness as “ecological systems are substantially free from the effects of modern civilization” and that natural ecological conditions and processes are preserved or restored. The National Park Service is not proposing any actions that would affect natural processes or ecosystem function as part of the backcountry management plan. Therefore, this topic was dismissed from detailed analysis.
- **Undeveloped.** The “undeveloped” quality of wilderness refers to the lack of installations or other sights and sounds of modern human occupation. *Keeping it Wild 2* states that this quality is affected by “nonconforming uses” as defined in Section 4(c) of the Wilderness Act, which includes modern structures, installations, motorized equipment, and mechanical transport. In certain locations, minimal signage and markers necessary to support wayfinding, visitor safety, and/or preservation of wilderness resources may be needed. Wayfinding aids and safety signage deemed necessary by NPS staff would be placed in areas outside the Wupatki eligible wilderness whenever possible to minimize effects to the area’s undeveloped quality. While any installations in eligible wilderness—including signs and markers—make the presence of humans and NPS management more noticeable and detract from the overall wilderness character of an area, signage deemed necessary for visitor safety or resource protection in the backcountry (including eligible wilderness) would be subject to minimum requirements analysis and, if determined necessary, designed to harmonize with the natural landscape and made the minimum size possible in accordance with NPS *Management Policies 2006*, Sections 6.3.10.4 “Signs.” Therefore, this topic was dismissed from detailed analysis.

While not analyzed in the plan, all of the qualities of wilderness character will be monitored for future changes and trends in accordance with the Wupatki Wilderness Character Baseline Assessment and Monitoring framework.

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APPENDIX G: EVALUATION OF APPROPRIATE VISITOR ACTIVITIES

The interdisciplinary NPS planning team evaluated a variety of potential visitor activities to determine which uses should be permitted in the backcountry (including eligible wilderness). To assist in the determination of potential uses in the backcountry, the team used a set of criteria that were adapted from *NPS Management Policies 2006*, 8.1.2 “Process for Determining Appropriate Uses” and 6.3 “Wilderness Resource Management General Policy” (described below). Wupatki National Monument was set aside to protect the invaluable archeological sites and prehistoric and historic structures built and inhabited by the ancestors of thirteen tribes that consider lands within the monument to be part of their ancestral homes and cultural origins. To these tribes, Wupatki National Monument holds immense cultural and spiritual significance. The backcountry planning team rooted its evaluation in the monument’s purpose, establishment legislation, NPS Management policy (including “Chapter 6: Wilderness Preservation and Management” and “Chapter 8: Use of the Parks” from *NPS Management Policies 2006*), NPS commercial services criteria and guidance for determination of extent necessary, consultation with tribes, and the overarching goal of achieving and maintaining desired conditions. Through this process, the National Park Service determined that both guided and unguided day hiking opportunities were appropriate in certain sections of the backcountry, and that overnight camping as part of an NPS-guided program could occur in the Pronghorn Plateau area. In the future, the National Park Service will continue to evaluate these uses by monitoring for impacts to resources and implementing adaptive management strategies, including changing access, as necessary.

EVALUATION CRITERIA

The following criteria were used in the evaluation described above. In the future, these criteria may also be used to evaluate new or emerging types of use. These criteria are derived from NPS management policies, director’s orders, and input from Flagstaff Area Monuments NPS staff. New and emerging uses must meet all the following criteria:

- The activity is consistent with and contributes to visitors’ understanding and appreciation of the monument purpose and significance.
- The activity is consistent with laws, regulations, and policies.
- The activity does not cause unacceptable impacts to fundamental resources and values that are unable to be mitigated.
- The activity does not create an unsafe or unhealthful environment for visitors and employees that cannot be mitigated.
- The activity helps achieve the desired conditions of the visitor use management plan (see chapter 1) and other relevant park planning documents.
- The activity does not unduly conflict with other monument uses and activities and is consistent with existing plans for public use and resource management.
- The activity is a key visitor experience not available within a reasonable distance from the monument.
- Evaluation for total costs to the Service.

For any lands that are in any category of wilderness—i.e., eligible, study, proposed, recommended, or designated (or potential as a subset of any of these five categories)—visitor use must be managed in accordance with the Wilderness Act and NPS wilderness policy. Policy includes Director’s Order 41:

Wilderness Stewardship; chapter 6 of *NPS Management Policies 2006: Wilderness Preservation and Management*; and *Reference Manual 41: Wilderness Stewardship*. Criteria from NPS policy 6.4.3 requires that recreational uses in wilderness will be of a type and nature that ensures its use and enjoyment

1. will leave it (i.e., wilderness) unimpaired for future use and enjoyment as wilderness,
2. provides for the preservation of the area as wilderness, and
3. provides for the preservation of wilderness character.

Further, this policy states that recreational uses in NPS wilderness areas will be of a nature that

- enables the areas to retain their primeval character and influence;
- protects and preserves natural conditions;
- leaves the imprint of man's work substantially unnoticeable;
- provides outstanding opportunities for solitude or primitive and unconfined types of recreation; and
- preserves wilderness in an unimpaired condition.

APPENDIX H: WUPATKI NATIONAL MONUMENT BACKCOUNTRY MANAGEMENT PLAN CULTURAL RESOURCE VULNERABILITY ASSESSMENT FORM

The following form is used by FLAG cultural resources staff as part of the planning process to evaluate the vulnerability of cultural resources (archeological sites) in the backcountry.

FLAGSTAFF AREA NATIONAL MONUMENTS**WUPA BMP VULNERABILITY ASSESSMENT**

Site/ASMIS #: _____ Other Name: _____ Site Type: _____

Use Area: _____

Name/Date of Monitor(s): _____

Name/Date of Last Inspection or Assessment: _____

Purpose: (check all that apply)

☐

Scheduled Monitoring

☐

Response to Incident

☐

Vulnerability Assessment

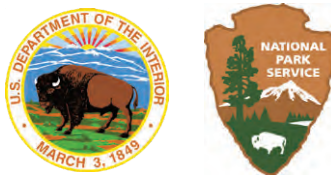
☐

Other

Accessibility: How easy is it for the average person to access the site?**Fragility:** How fragile is the site in terms of geomorphology? What is the condition of the slopes, soils, vegetation, and erosion?**Portability:** How easily and what types of artifacts can be removed from the site?**Visibility:** How visible is the site feature(s) from a distance and/or surface artifacts? Are there standing structures or decorated artifacts?

Vulnerability	Rating
Accessibility 1- Steep/uneven/broken terrain requiring additional effort 2- Flat/level open ground	
Fragility 1- Flat/level, heavy vegetation, no signs of slope erosion, bedrock 2- Moderate slopes, moderate vegetation, moderate erosion, moderately stable soils 3- Steep slope, little vegetation, signs of slope erosion, loose soils	
Portability 1- Least portable with very few diagnostic/attractive artifacts 2- Somewhat portable with moderate amount of diagnostic/attractive artifacts 3- Most portable with abundant diagnostic/attractive artifacts	
Visibility 1- Low density of artifacts, non-decorated artifacts, and/or subterranean structures such as pithouses or cists 2- Moderate density of artifacts, rock alignments 3- Standing structures, rubble mounds, and/or decorated artifacts	
Human Disturbance Present? 1- No 2- Yes (circle which applies): <input type="radio"/> Past <input type="radio"/> Present <input type="radio"/> Both	
Vanishing Treasures Structures (3 courses of free-standing construction visible above ground surface) 1- Rubble only structures 2- Stabilized free-standing walls 3- Free-standing walls not stabilized	
Human Remains or Burial Features Present? 1- No 2- Yes	
Total 7-10 = Low vulnerability 11-14 = Moderate vulnerability 15-18 = High vulnerability	0
NOTE: A score of 2 on Human Remains automatically get a High Vulnerability score.	

Comments: _____



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under US administration.



WUPATKI NATIONAL MONUMENT
BACKCOUNTRY MANAGEMENT PLAN / GMP AMENDMENT / ENVIRONMENTAL ASSESSMENT

