

Badlands National Park  
South Dakota

U.S. Department of the Interior  
National Park Service



# Cedar Pass Development Concept Plan and Environmental Assessment

ENVIRONMENTAL ASSESSMENT



September 2018



**United States Department of the Interior  
National Park Service  
Badlands National Park**

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Development Concept Plan and  
Environmental Assessment**

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Concept Plan and Environmental Assessment**

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The National Park Service (NPS) at Badlands National Park (the park) is preparing a development concept plan / environmental assessment for the Cedar Pass Developed Area (Cedar Pass area) of the park. The park's 2006 general management plan for the north unit zones the Cedar Pass area for future development and identifies it as the principal area for visitor contact and park administration (NPS 2006a). The 215-acre project area includes the Ben Reifel Visitor Center; park administrative buildings; park employee housing; the Cedar Pass Lodge and associated outbuildings and cabins; the operational support area; a maintenance area; and the park amphitheater and campground.

This plan fulfills a park planning priority for resource preservation, facility asset management, and visitor use management at Badlands National Park and serves as a component of the park's planning portfolio. The park's north unit planning portfolio consists of the individual plans, studies, and inventories, which together guide park decision making. The planning portfolio enables the use of targeted planning documents (such as this one) to meet a broad range of park planning needs and fulfill legal and policy requirements. The 2006 *Badlands National Park, North Unit Final General Management Plan* remains a critical piece of the park's planning portfolio and will continue to be updated and/or supplemented in a timely manner through the development of additional park planning documents.

The National Park Service prepared an environmental assessment to evaluate three action alternatives for the Cedar Pass development concept plan, describe the environment that would be affected by the alternatives, and assess the environmental consequences of implementing the alternatives. This environmental assessment examines potential impacts on stormwater and floodplains, visitor experience and safety, cultural landscapes, historic structures, and paleontological resources.

This document has been prepared in accordance with the National Environmental Policy Act of 1969, as amended; section 106 of the National Historic Preservation Act; regulations of the Council on Environmental Quality (40 Code of Federal Regulations 1500–1508); and NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2011) and accompanying handbook (2015).

**Note to Reviewers and Respondents:**

If you wish to comment on this EA, you may mail comments within 30 days to the address below or you may post them electronically at <http://parkplanning.nps.gov/badl>. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask in your comment to withhold your personal identifying information from public review, NPS cannot guarantee that it will be able to do so.

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# **CHAPTER 1: PURPOSE AND NEED**

## **INTRODUCTION**

The National Park Service (NPS) at Badlands National Park (the park) is preparing a development concept plan / environmental assessment (DCP/EA) for the Cedar Pass Developed Area (Cedar Pass area) of the park. The park's 2006 general management plan for the north unit zones the Cedar Pass area for future development and identifies it as the principal area for visitor contact and park administration (NPS 2006a).

The project area is the entire 215-acre Cedar Pass area, which represents less than 1 percent of the total acreage of the park, as shown in figure 1. Existing facilities of note within the scope of the plan include the Ben Reifel Visitor Center; park administrative buildings; park employee housing (including apartments and single-family residences); the Cedar Pass Lodge and associated outbuildings and cabins; the fire cache building located in the operational support area; a maintenance area; and the park amphitheater and campground. While the maintenance area is included in the overall project area, this development concept plan / environmental assessment does not address future construction or substantial renovations to these facilities, and as such, this document does not include the maintenance area in its description of environmental conditions and evaluation of impacts.

This development concept plan / environmental assessment fulfills a park planning priority for resource preservation and facility asset management and serves as a component of the park's planning portfolio. The park's north unit planning portfolio consists of individual plans, studies, and inventories, which together guide park decision making. The planning portfolio enables the use of targeted planning documents (such as this one) to meet a broad range of park planning needs and fulfill legal and policy requirements. The 2006 *Badlands National Park, North Unit Final General Management Plan* remains a critical piece of the park's planning portfolio and will continue to be updated and/or supplemented in a timely manner through the development of additional park planning documents.

This development concept plan/environmental assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and implementing regulations, 40 Code of Federal Regulations (CFR) Parts 1500–1508, Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* and the *National Park Service NEPA Handbook* (NPS 2011, 2015).

## **PURPOSE OF THE ACTION**

The purpose of this project is to improve visitor experience, management capabilities, and park facilities at the Cedar Pass area by creating a plan for redevelopment of this area that would be consistent with the character-defining aspects of the associated historic district and cultural landscape and protect the fragile resources in the area. The redevelopment plan would identify these needs and determine how they can be accommodated at the Cedar Pass area.

## **NEED FOR THE ACTION**

The proposed project is needed because current visitor and employee facilities at the Cedar Pass area do not meet the needs of visitors, the concessioner, or the park. A development concept plan is needed to address these and future development needs within the context of the park's resources and engineering limitations. The Cedar Pass area is the primary visitor center in the park, with the earliest facilities constructed during the early to mid-20th century. These facilities were influenced by New Deal era infrastructure and the NPS Mission 66 program. Over time, the existing facilities have become inadequate

for various reasons. The facilities lack office space and housing for park employees, and the existing temporary buildings installed to alleviate these problems have reached the end of their useful life. Visitor amenities, such as the visitor center, lodging, campground, parking, and traffic circulation cannot accommodate increased visitation and changing visitor needs. The concessioner operates from one of the oldest buildings in the Cedar Pass area that has developed structural issues; is in need of costly repairs; and presents life, health, and safety issues. These issues make servicing the park and visitors difficult.

## **OBJECTIVES IN TAKING ACTION**

All of the action alternatives selected for detailed analysis must meet specific objectives and support the purpose of, and need for, action. The following objectives are grounded in the purpose of, and need for, action and the park's purpose and enabling legislation as detailed in its draft foundation document and Public Law No. 1021.

### **ADMINISTRATION**

- Develop space for administrative operations that is appropriate in size and type.
- Provide park staff with a permanent headquarters facility/location.

### **VISITOR EXPERIENCE**

- Alleviate congestion in the visitor center, lodge, campground, and other concession facilities.
- Accommodate the growing demand in visitor services.
- Provide for the interpretation of the paleontological resources present at the park, including providing a permanent fossil preparation laboratory space as part of the visitor experience.
- Provide for the interpretation of natural and cultural resources, including providing spaces for visitor education and interpretation (both indoors and outdoors).

### **NATURAL RESOURCES**

- Protect paleontological resources present at the Cedar Pass area.
- Protect geologic resources, viewsheds, and landscapes present at the Cedar Pass area.
- Design infrastructure and facilities in a manner that avoids areas of concern for natural resources, such as natural drainage areas and wetlands where flooding is a concern.

### **CULTURAL RESOURCES**

- Establish a unified character for future development that is consistent with the Cedar Pass Historic District and Cultural Landscape.
- Ensure that the defining characteristics of the historic district and cultural landscape are preserved during future improvements and developments.
- Preserve and protect cultural resources to highlight the interpretive and educational values present at the Cedar Pass area.

## **BACKGROUND**

As shown in figure 1, the park comprises 242,576 acres and is located 70 miles east of Rapid City, South Dakota. The north unit of the park includes the 64,250-acre Badlands Wilderness area and Cedar Pass.

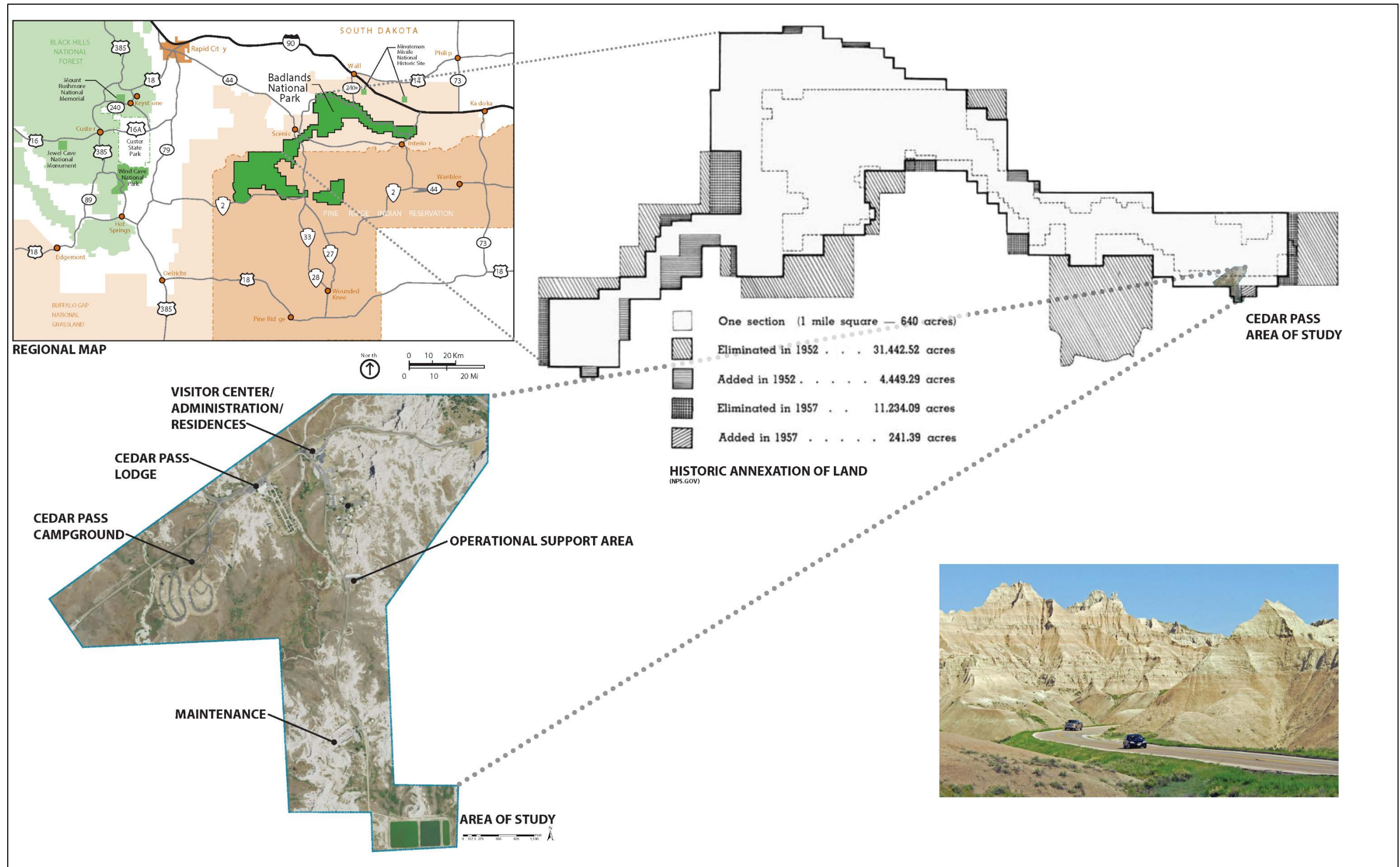


FIGURE 1: REGIONAL CONTEXT AND STUDY AREA

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Badlands National Monument originally encompassed 110,000 acres of the South Dakota Badlands; it was established by Public Law No. 1021 and signed by President Coolidge on March 4, 1929. On January 24, 1939, the area was officially established as a national monument. The redesignation to national park occurred on November 10, 1978, following four separate boundary changes. The park's outstanding scenic values, its importance to the science of paleontology, and its natural resources were, and continue to be, its signature features.

## **PURPOSE AND SIGNIFICANCE OF THE PARK**

The purpose statement identifies the specific reason(s) for establishment of a particular park. The purpose statement for Badlands National Park was drafted through a careful analysis of its enabling legislation and the legislative history that influenced its development. The purpose statement lays the foundation for understanding what is most important about the park.

The purposes of Badlands National Park are based on the various pieces of legislation that resulted in the creation of the park and the legislation governing the National Park Service. Badlands National Park is to be managed to accomplish the following:

- Protect the unique landforms and scenery of the White River Badlands for the benefit, education, and inspiration of the public.
- Preserve, interpret, and provide for scientific study of the paleontological and geological resources of the White River Badlands.
- Preserve the flora, fauna, and natural processes of the mixed-grass prairie ecosystem.
- Preserve the Badlands Wilderness Area and associated wilderness values.
- Preserve and interpret the history, culture, and heritage of the Sioux Nation and Lakota people.
- Preserve and interpret the archeological and contemporary history of use and settlement of lands within the park.

Significance statements express why a park's resources and values are important enough to merit designation as a unit of the national park system. These statements are linked to the purpose of Badlands National Park and are supported by data, research, and consensus. Statements of significance describe the distinctive nature of the park and why an area is important within a global, national, regional, and system-wide context. They focus on the most important resources and values that will assist in park planning and management.

According to the north unit general management plan (NPS 2006a), Badlands National Park is significant for the following reasons:

- The park's geological and paleontological resources provide insight into climatic history, biological diversity, evolution, and the geological process particular to the boundary between the Eocene and Oligocene epochs, as well as a unique opportunity to trace the evolution of the prairie ecosystems of the Great Plains.
- The long history of research in the White River Badlands has contributed greatly to the science of vertebrate paleontology in North America.
- The park contains spectacular scenery, including predominantly highly eroded landforms that comprise a concentrated collection of rutted ravines, serrated towers, pinnacles, and precipitous gulches.
- The park protects places of spiritual and historical significance to the Lakota people, including the site of one of the last Ghost Dances, which precipitated the 1890 massacre at Wounded Knee.

- The harsh climate and extreme geography of the Badlands region influenced both the aboriginal use and contemporary settlement patterns of lands now administered by the National Park Service.
- The north unit preserves 64,250 acres of designated wilderness of badlands and prairie that offer outstanding opportunities for exploration and solitude.
- The park protects a substantial remnant of native prairie and encompasses the largest mixed-grass prairie within the national park system.
- The park provides unparalleled opportunity to observe bison, bighorn sheep, swift fox, pronghorn, coyotes, prairie dogs, black-footed ferrets, and other native animals in their natural habitat.

## **RELATIONSHIP TO OTHER PLANNING EFFORTS**

The Cedar Pass development concept plan and environmental assessment is heavily informed by and is being prepared in coordination with three other studies and will also consider the contents of the concession contract for the Cedar Pass Lodge and campground. The market analysis report, historic structure report, and housing needs assessment are parallel planning efforts undertaken by the park to identify the service needs and facility requirements for the Cedar Pass Lodge and employee housing area and are described in the following sections.

### **MARKET ANALYSIS REPORT**

This report, completed in 2017, provides recommendations related to visitor services, facilities, and the size and configuration of lodging, retail, food and beverage, and concessioner administrative spaces (Dornbush Associates 2017). These recommendations are based on tourism trends in South Dakota, park visitation data, documented demand for concession services, historical utilization statistics and revenue, and the results of site visits and interviews with the concessioner, park staff, chamber of commerce, and other local businesses in the Wall and Rapid City area. The results of the market analysis were used to develop action alternatives that provide adequate space for the concessioner-operated Cedar Pass Lodge and associated amenities, cabins, and campground based on the anticipated demand for these services over time.

### **HISTORIC STRUCTURES REPORT**

This report, completed in 2018, provides recommendations for the long-term preservation and stewardship for the Cedar Pass Lodge, Lodge Cottage, laundry building, maintenance building, ice house, and overall site (NPS 2018a). These recommendations are based on a comprehensive analysis of the physical evolution of each element (including documentation of historic significance and evaluation of integrity) and the existing architectural, structural, mechanical, electrical, and hazardous material conditions of each, as well as their character defining features. Notably, this report updates the 2015 *Comprehensive Condition Assessment Report* that identified critical structural deficiencies at the lodge building, including water infiltration, soil erosion, and open floor joists. Based on this analysis, three site design options were developed that address operational needs while ensuring that long-term preservation and stewardship objectives are met to the maximum extent practicable. These options were presented during a work session with the park in February 2018, after which they were further refined. Each of these three design options for the Cedar Pass Lodge and cabins (all located within the Cedar Pass area) have been included in an action alternative with a complementary approach to future development.

## **HOUSING NEEDS ASSESSMENT**

This report, completed in 2011, assesses the housing needs for employees at the park's three reporting stations—Cedar Pass (headquarters), Pinnacles, and Stronghold—based on current programmatic and funding requirements. Housing needs are based on the staffing requirements at each reporting station, the available housing at each reporting station, and a market analysis that identifies the amount of affordable housing located within a 60 minute commute of each reporting station. This report also outlines the number of required occupants (NPS employees required to live in park housing to respond to emergency situations) and permitted occupants at each reporting station (Johnson et al. 2011). The results of this report as they pertain to the Cedar Pass reporting station were used to inform the amount and type of employee housing added to the Cedar Pass area under the action alternatives.

## **CEDAR PASS LODGE/CAMPGROUND CONCESSIONER**

Cedar Pass Lodge and the campground are operated under a concession contract (CC: BADL001) between the National Park Service and a contract awardee known as a concessioner. The current contract (BADL001-09) is a Category I Contract providing visitor services including lodging, camping, merchandise, and food and beverage services. The existing contract covers November 1, 2009, through October 31, 2019. The National Park Service will develop a prospectus for a new concession contract that will replace BADL001-09. The concession contract prospectus development process is a separate planning action of the National Park Service, governed by the National Park Service Concessions Management Improvement Act of 1998 (Public Law No. 105-391) and 36 CFR Part 51. The development concept plan, historic structures report, and other related park planning documents are integral to the concession contract prospectus development process.

## **SAGE CREEK CAMPGROUND PLANNING STUDY**

The Sage Creek campground is a primitive campground located on the west side of the park's north unit, approximately 30 miles west of the Cedar Pass area. Because of its scenic beauty and free admission, this campground is experiencing overcrowding. Visitors who are not able to obtain a campsite based on the existing a first-come, first-served policy at Sage Creek may seek accommodation, if available, at the Cedar Pass campground for a fee, exacerbating crowding in this location. Concurrent with the preparation of the Cedar Pass development concept plan, the park is undertaking a separate planning effort for the Sage Creek campground to identify and implement new management strategies to help reduce the impact on visitors and park resources, and to help ensure that the north unit of the park is capable of meeting overall visitor demand for camping facilities.

## **ISSUES AND IMPACT TOPICS**

The issues and concerns identified during scoping were used to identify potential impact topics associated with further development of the Cedar Pass area. These topics are resources of concern that could be beneficially or adversely affected by the actions proposed under each alternative and are developed to ensure that the alternatives are evaluated and compared based on the most relevant topics. A brief rationale for the selection of each impact topic is provided; these impact topics are further explored in "Chapter 3: Affected Environment" and are analyzed in "Chapter 4: Environmental Consequences." For those topics that were dismissed from further consideration, an explanation is provided as to why they were dismissed.

## **IMPACT TOPICS ANALYZED IN THIS ENVIRONMENTAL ASSESSMENT**

### **STORMWATER AND FLOODPLAINS**

While there are no perennial surface waterbodies or streams in the Cedar Pass area, two intermittent streams carry stormwater following precipitation events. Both streams carry discharges from the major geologic formations in the area. Additionally, the precipitation and soil conditions within the Cedar Pass area, as discussed in chapter 3, are such that overland sheet flow often results from precipitation events, resulting in naturally high rates of erosion and sediment loading that characterize the badlands landscape. Additionally, the Cedar Pass area includes floodplains and flood-prone areas. The construction of new facilities and infrastructure as part of the development concept plan could alter these surface water flows, and an increase in impervious surfaces through the development of facilities and infrastructure could exacerbate current stormwater management and erosion concerns and increase sediment accumulation in drainage areas. Because of these concerns, this impact topic is carried forward for detailed analysis.

Several federal statutes and NPS directives govern the management of stormwater and floodplains within the Cedar Pass area. The Clean Water Act (33 United States Code [USC] 1251 et seq.) was enacted to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters”. Section 438 of the Energy Independence and Security Act, establishes strict stormwater runoff requirements for federal development and redevelopment projects, requiring that a federal facility with a footprint that exceeds 5,000 square feet “use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.” NPS *Management Policies 2006* and Director’s Order 77-2: *Floodplain Management* (NPS 2006b, 2003) provide guidelines for proposals in floodplains. In accordance with these management policies, a Floodplain Statement of Findings has been prepared and is included in this development concept plan / environmental assessment as appendix A. Consideration of impacts on floodplains is also required under Executive Order 11988 “Floodplain Management,” which requires an examination of impacts on floodplains and potential risk involved in placing facilities in floodplains. Because of the potential impacts on floodplains at the Cedar Pass area, this impact topic is carried forward for detailed analysis.

### **VISITOR EXPERIENCE AND SAFETY**

The current facilities and amenities in the Cedar Pass area are inadequate to meet the growing demand for interpretive programs, lodging, camping, dining, and parking and access for a variety of vehicle sizes and types. Improving the park’s facilities and associated infrastructure under each of the action alternatives would improve the visitor experience to varying degrees. Because each alternative could affect visitor experience and accessibility, this impact topic is carried forward for detailed analysis.

### **CULTURAL LANDSCAPES**

The Cedar Pass area is associated with early tourism in western parks, New Deal and Civilian Conservation Corps (CCC) development, and NPS’s Mission 66 initiative between 1928 and 1966, and has been recommended for inclusion as a comprehensive historic district under National Register of Historic Places (national register) criteria. Because renovation and construction of new facilities and infrastructure could potentially affect the integrity of the cultural landscape in the Cedar Pass area, this impact topic is carried forward for detailed analysis.

## **HISTORIC STRUCTURES**

Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.), and its implementing regulations under 36 CFR Part 800 require all federal agencies to consider effects of federal actions on historic properties, including historic structures eligible for or listed in the national register. Currently, 27 structures are contributing features to the national register-eligible historic district, including the visitor center and Cedar Pass Lodge. These facilities would potentially be affected, through either demolition or rehabilitation, by the redevelopment proposed under each of the action alternatives. Therefore, this impact topic is carried forward for detailed analysis.

## **PALEONTOLOGICAL RESOURCES**

The park contains an abundance of fossilized remains and other paleontological resources and has contributed substantially to the science of paleontology. The science of vertebrate paleontology continues to play an important role in management and programming of the park (NPS 2006a). Because of the high density of fossils, construction activities under all of the action alternatives would likely affect paleontological resources that are found throughout the Cedar Pass area in areas not directly disturbed by existing facilities and infrastructure. Therefore, this impact topic is carried forward for detailed analysis.

## **IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS**

The National Environmental Policy Act and the Council on Environmental Quality (CEQ) regulations direct agencies to prepare NEPA documents that are “concise, clear, and to the point” (1500.2(b)). NEPA reviews should focus on important environmental issues and avoid “amassing needless detail” (1500.1(b)).

Furthermore, agencies are directed to discuss non-significant issues only in enough detail to show why more study is not warranted (40 CFR 1502.2 and Section 4.2(E) of the NPS NEPA handbook). The impact topics that have been dismissed from detailed analysis in this development concept plan/environmental assessment are listed below. During internal scoping, the interdisciplinary team reviewed all impact topics analyzed and considered the impacts that could potentially result from the proposed action. In the cases where impacts are not anticipated or where impacts under all the alternatives are expected to be minor or less, the impact topics were dismissed from detailed analysis and the rationale for dismissal is included below.

## **WETLANDS**

Wetlands do not occur on or near the Cedar Pass area. Therefore, this topic was dismissed from further analysis and a statement of findings is not required for wetlands.

## **GEOLOGY AND SOILS**

Each action alternative would not require excavation or grading in a way that would disrupt any geological resources outside of the area zoned for development in the park’s general management plan for the north unit. The majority of soils in this area are previously disturbed, and any additional ground disturbance would be minimal. Therefore, these topics were dismissed from further analysis.

## **VEGETATION**

Under each action alternative, the proposed development would occur within areas designated for development in the north unit general management plan. While some existing vegetation could be

removed to accommodate new and expanded facilities, each development concept would increase the net quantity and quality of vegetation, through landscape design consistent with the recommendations of the cultural landscape report to the greatest extent practicable. Therefore, this topic was dismissed from further analysis.

## **AIR QUALITY AND CLIMATE CHANGE**

Section 118 of the Clean Air Act requires the National Park Service to meet all federal, state, and local air pollution standards (42 USC 7401 et seq.). The Cedar Pass area development concept plan would not affect air quality or result in the increased discharge of greenhouse gases to the atmosphere that affect climate change. Implementation of any action alternative would result in localized emissions and fugitive dust during construction activities; however, emissions and fugitive dust would occur only during the construction period and would dissipate quickly. No long-term impacts on air quality are expected. Therefore, this topic was dismissed from further analysis.

## **HAZARDOUS, TOXIC AND RADIOACTIVE WASTE**

The Cedar Pass area includes two potential sources of hazardous material: the old wastewater lagoon and the Cedar Pass Lodge. The old wastewater lagoon, inoperable since the early 2005 is located southeast of the campground area. According to the US Environmental Protection Agency's Envirofacts, this site is regulated as a conditionally exempt small quantity generator, which requires the park to meet certain federal requirements under 40 CFR Part 262 related to the safe handling and management of the small quantities of hazardous waste found on this site (USEPA n.d.). No ongoing environmental remediation actions or contamination issues are associated with this site; however, prior to constructing any campground improvements, the park may choose to perform soil testing or other studies to ensure the surrounding soils have not been contaminated. Laboratory testing performed as part of the 2015 geotechnical survey of the Cedar Pass Lodge indicated the presence of either degraded gasoline or diesel product in soils adjacent to this facility (NPS 2018a). Prior to the redevelopment of the Cedar Pass Lodge, the park would perform environmental remediation in accordance with applicable state and federal law, including the safe disposal of any contaminated soils. The proposed action would not introduce any new hazardous, toxic, or radioactive waste to the Cedar Pass area; therefore, in meeting these regulatory obligations, all adverse impacts on human and health and safety would be avoided. Therefore, this topic was dismissed from further analysis.

## **INDIAN TRUST RESOURCES**

Indian trust resources are not present in the project area; therefore, no impacts would occur. In accordance with the Environmental Compliance Memorandum 97-2 by the US Department of the Interior, the National Park Service must ensure that it explicitly addresses any anticipated effects on Indian trust resources in an environmental compliance document. If any effects are identified, the National Park Service must consult with the affected tribe(s) on a government-to-government basis with respect to the impact from the proposed project or action. However, if the project or action is expected to have either an insignificant impact or no impact on any Indian trust resources, the environmental compliance document must state the reason for dismissal. Because no known Indian trust resources exist in the Cedar Pass area, this topic was dismissed from further analysis.

## **INDIAN SACRED SITES**

In accordance with Executive Order 13007, "Indian Sacred Sites," the National Park Service must accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. Continued access to, and use of, these

sites is often essential to the survival of family, community, or regional cultural systems, including patterns of belief and sociocultural and religious life. However, no known Indian sacred sites are found in the Cedar Pass area. Therefore, this topic was dismissed from further analysis.

## **NOISE AND SOUNDSCAPES**

In accordance with the NPS *Management Policies 2006* and Director's Order 47: *Sound Preservation and Noise Management* (NPS 2000), an important component of the NPS mission is the preservation of the natural soundscape. The development of facilities and infrastructure would occur within the area zoned for development in the north unit's general management plan. Construction equipment would have short-term impacts in the project area where sounds from vehicular traffic and other human activities are common. During construction, anthropogenic noise would likely increase because of construction activities, equipment, vehicular traffic, and crews. Any sounds generated from construction would be temporary, lasting only as long as the construction activity is generating the sounds, and would have no long-term, measureable effect on visitors, employees, or natural soundscape conditions. Therefore, this topic was dismissed from further analysis.

## **LAND USE**

Land use within the Cedar Pass area would not change under any of the action alternatives, and future development of this area would be consistent with the park's general management plan for the north unit. Therefore, this topic was dismissed from further analysis.

## **ENERGY**

The facilities within the Cedar Pass area are aging, and contain limited modern energy-saving features and devices. All of the action alternative would incorporate sustainable design concepts that would minimize energy use, and facilities would include features and devices designed to use energy more efficiently. Therefore, this topic was dismissed from further analysis.

## **DARK NIGHT SKIES**

In accordance with NPS *Management Policies 2006*, the National Park Service strives to preserve dark night skies and will "minimize light that emanates from park facilities, and also seek the cooperation of park visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the ecosystems of parks" (NPS 2006b). No construction activities would occur at night, and ambient light levels would not increase beyond current levels. Therefore, this topic was dismissed from further analysis.

## **SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE**

Future development within the Cedar Pass area would not affect socioeconomics. Short-term impacts during construction could include a reduction in visitation, but visitation and associated spending would recover after the project is complete. Likewise, the construction associated with all the action alternatives would result in minimal increases in employment for the construction workforce and revenues for the businesses engaged in the construction process. Any increase in workforce and revenue, however, would be temporary, lasting only as long as construction.

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or

environmental effects of their programs and policies on minorities and low-income populations and communities. Disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the US Environmental Protection Agency's Environmental Justice Guidance (1998) would not occur from the construction activities under the action alternatives. Therefore, this topic was dismissed from further analysis.

### **INVASIVE SPECIES**

Halogeton and Canada thistle are documented invasive species in the Cedar Pass area. All of the action alternatives include enhancements of park open space in each development cluster that would incorporate native grasses and vegetation and remove invasive species not compatible with the cultural landscape of Cedar Pass. Therefore, the redevelopment of the Cedar Pass area would reduce the amount of invasive species, and existing management practices would be continued and strengthened to control the future spread of these species. Therefore, this topic was dismissed from further analysis.

### **WILDLIFE**

The Cedar Pass area is zoned for development, and as a result, it does not provide quality terrestrial habitat. During the construction period, there would be minimal and temporary impacts on wildlife in the project area from increased noise and disturbance from construction equipment.

### **THREATENED AND ENDANGERED SPECIES**

No threatened and endangered species or habitats are known to occur in the Cedar Pass area. Consequently, the National Park Service has made a determination of no effect under section 7 of the Endangered Species Act, and further consultation with the US Fish and Wildlife Service regarding impacts on federally protected species is not required. Therefore, this topic was dismissed from further analysis.

### **ARCHEOLOGICAL RESOURCES**

Archeological investigations of other sites near Cedar Pass in the 1960s suggest that the occupation of the sites in the Badlands were closely related to village sites farther east along the Missouri River. However, given the continuous tourism-relative occupation of the area since the early 20th century, several historic-period sites including the former dance hall, lodge dorms, CCC's structures, and former roads are within the Cedar Pass area. Several of these sites, including the former dance hall (39JK251), and two other early 20th-century concrete structure remnants (39JK227 and 39JK 237) have been identified. However all three are considered not eligible for the national register (NPS 2004; John Milner Associates 2005).

If, during construction, previously undiscovered archeological resources were uncovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the state historic preservation office, and in accordance with Director's Order 28A: *Archeology*, as well the National Historic Preservation Act, Archaeological Resources Protection Act, and other applicable regulations. Therefore, archeological resources were dismissed as an impact topic.

## **ETHNOGRAPHIC RESOURCES**

Ethnographic resources are landscapes, objects, plants and animals, or sites and structures that are important to a people's sense of purpose or way of life. While the landscape and structures found within the Cedar Pass area are important to the cultural landscape and historic context of the park, they are not important to a people's sense of purpose or way of life. Therefore, this topic was dismissed from further analysis.

## **MUSEUM COLLECTIONS**

While the Ben Reifel Visitor Center features a museum collection of paleontological specimens, the proposed action would not alter the collection and would provide enhanced space in which to display this collection. Therefore, this topic was dismissed from further analysis.

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## **CHAPTER 2: ALTERNATIVES**

The National Environmental Policy Act requires federal agencies to explore a range of reasonable alternatives aimed at addressing the purpose of and need for the proposed action. Reasonable alternatives include alternatives that are “technically and economically practical or feasible and meet the purpose and need of the proposed action” (43 CFR § 46.420(b)). The alternatives under consideration must include a no-action alternative as prescribed by CEQ regulations for implementing the National Environmental Policy Act (40 CFR 1502.14).

This chapter describes the DCP/EA alternatives for the Cedar Pass area in the park consistent with the purpose of and need for action. A table, provided at the end of this chapter, compares all alternatives analyzed in this development concept plan / environmental assessment. Alternatives and actions that were considered but are not technically or economically feasible, do not meet the purpose of and need for the project, create unnecessary or excessive adverse impacts on resources, or conflict with the overall management of the park or its resources were dismissed from detailed analysis (see “Alternatives Considered but Dismissed from Detailed Analysis”). This chapter also identifies the NPS preferred alternative and lists mitigation measures for each of the action alternatives.

The National Park Service explored and objectively evaluated four alternatives in this design concept plan / environmental assessment:

- Alternative 1: No Action
- Alternative 2: Preserve and Restore Mission 66 at Cedar Pass
- Alternative 3: Minimize Building Footprint
- Alternative 4: Redefine the Experience at Cedar Pass

Each alternative is described in detail in the following sections.

### **ALTERNATIVE 1: NO ACTION**

The no-action alternative “sets a baseline of existing impact continued into the future against which to compare impacts of action alternatives” (NPS 2011). Under the no-action alternative, the park would continue to operate and maintain the existing facilities in their existing conditions, configurations, and locations. Figure 2 is a plan view of the existing facilities and infrastructure under the no-action alternative.

### **VISITOR CENTER**

The Ben Reifel Visitor Center would continue to be located along the Badlands Loop Road, northeast of Cedar Pass Lodge, and would house museum exhibits, classroom and restrooms facilities, a theater, and a visitor center store offering interpretive materials operated by the Badlands Natural History Association (BNHA). The National Park Service would continue to offer guided hikes, talks, activities, and programs from the visitor center during the summer season. Available parking at this location would consist of 54 visitor stalls, 5 bus stalls, 15 recreational vehicle (RV) stalls, and 32 staff stalls. The National Park Service would continue to address deferred maintenance through cyclical operations.

### **HEADQUARTERS AND ADMINISTRATIVE FUNCTIONS**

Administrative functions would continue to be housed in temporary structures located adjacent to the visitor center. The current facilities were never intended to be a long-term solution for park administration

functions and are inadequate in terms of available space and function and do not fit with the park's landscape. Staff parking, consisting of 37 parking stalls, would remain in place.

### **PARK STAFF HOUSING**

The employee housing area, located south of the visitor center, would continue to accommodate up to 47 employees in 16 apartment units for seasonal employees, 8 two- and three-bedroom homes for permanent employees, and 9 RV pads. Limited concessioner housing would continue to be provided in temporary housing near the Cedar Pass Lodge, and many seasonal and concessioner staff, as well as Minuteman National Historic Site (MMNHS) staff would not have access to housing in the park. Forty-four parking stalls would continue to be available for park staff use in this area.

### **CEDAR PASS LODGE AREA**

The Cedar Pass Lodge, operated under a concession contract, would continue to be located between the Ben Reifel Visitor Center and campground, along Badlands Loop Road. The facility's substantial structural issues would remain unaddressed, and the current services and amenities, which include a gift shop and full-service restaurant during the summer season, would continue to operate. Increasing visitor demand would remain unmet. The concessioner would continue to operate the 20 stand-alone cabins and 3 duplex units, constructed in 2013–2014, during the summer months. The viability of future concessions at the lodge complex could be jeopardized without the needed robust upgrades to operations and facilities.

### **CAMPGROUND AND AMPHITHEATER**

The campground, currently operated under a concession contract, would continue to consist of 96 individual sites, with 22 electric tent/RV campsites and 70 non-electric tent/RV campsites, no camper cabins, and 4 group camping sites. The amphitheater would continue to host daily and special events. Light from the town of Interior and passing cars would continue to interfere with nighttime programs. The amphitheater parking lot would continue to be unable to accommodate tour buses or recreational vehicles, and no vehicle drop-off area or overflow parking area would be available. Accessibility to the campground would continue to be hindered by the lack of large parking spaces and drop off areas and narrow travel lanes.

### **TRAILS AND MULTIMODAL ACCESS**

Under alternative 1, no changes to the existing trails or pedestrian access within the Cedar Pass area would occur.

**Badlands National Park**  
Cedar Pass Development Concept Plan & EA  
South Dakota  
**ALTERNATIVE 1**  
No Action Alternative

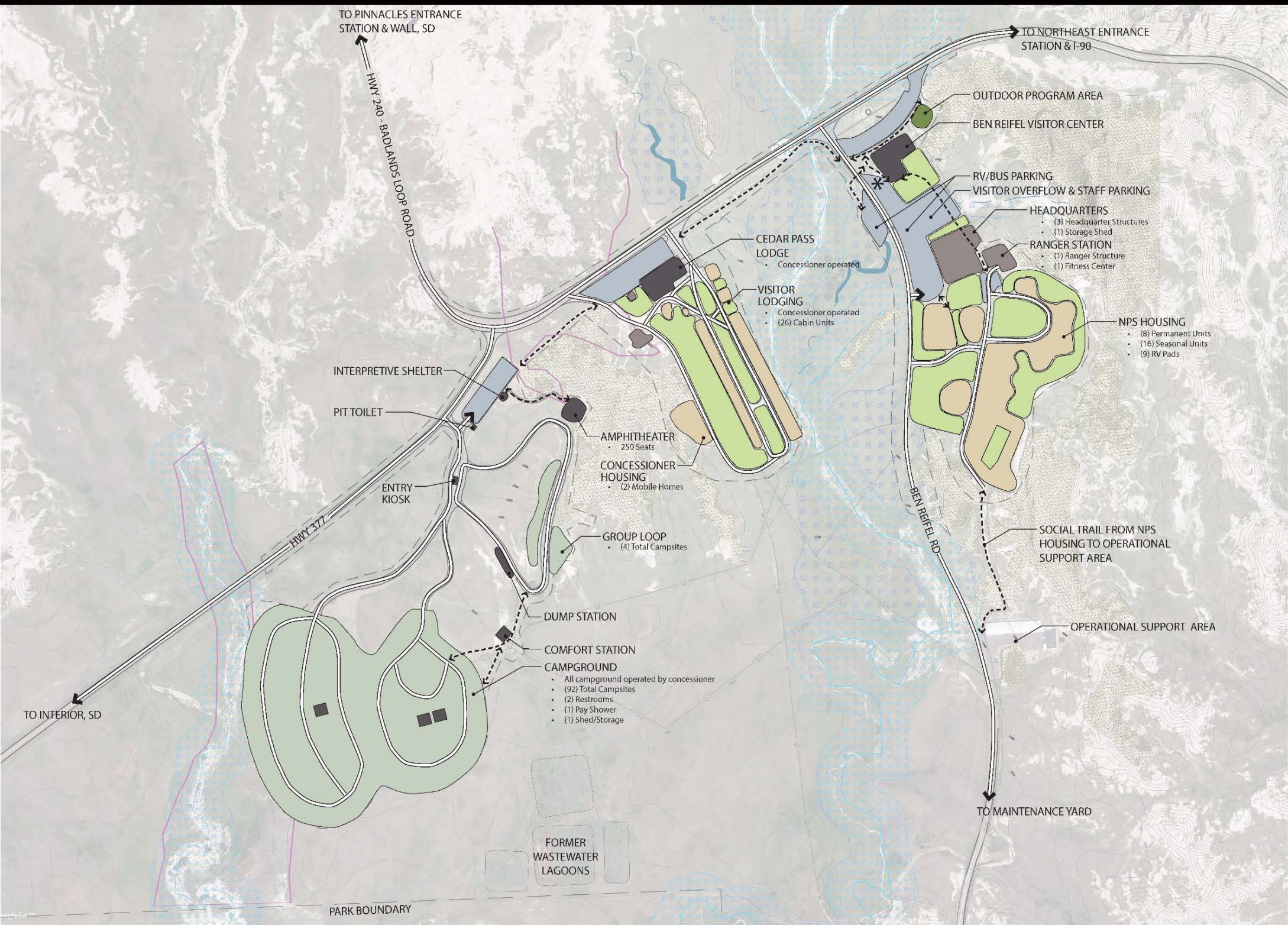
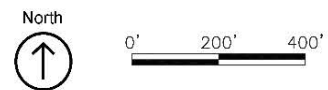
National Park Service  
U.S. Department of the Interior



**Legend**

- OPEN SPACE
- OUTDOOR PROGRAM AREA
- VISITOR CONTACT FACILITIES
- NPS SUPPORT FACILITIES
- PARKING
- HOUSING
- VISITOR LODGING
- VISITOR CAMPGROUND
- VEHICULAR ROADS
- PEDESTRIAN WALKS/TRAILS
- DROP-OFF
- PRESERVATION DEVELOPMENT ZONE
- 1 METER CONTOUR INTERVALS (CONTOUR INTERVAL ROUNDED TO THE NEAREST WHOLE NUMBER)
- 2014 FLOODED ZONE, KNOWN FLOOD RISK ZONE
- POTENTIAL FLOOD RISK
- 1951 HISTORIC STREAMS
- SOILS-FREQUENTLY FLOODED & FLOODED
- SOILS-OCCASIONALLY FLOODED
- SANITARY SEWER
- WATER
- PROPANE
- FOSSILIFEROUS OUTCROPS AND BUTTES

SOURCES: THE BACKGROUND BASE MAP IS INTENDED FOR REFERENCE ONLY. EXISTING BACKGROUND INFORMATION IS COMPRISED OF: 2017 GOOGLE EARTH AERIAL PHOTOGRAPHY, PARK PROVIDED GIS DATA & DIGITIZED MAPS, USGS GIS DATA, & CLR 2005 DIGITIZED MAPS FOR THE SURROUNDING AREAS.



**FIGURE 2: NO-ACTION ALTERNATIVE SITE PLAN**

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## **ELEMENTS COMMON TO ALL ACTION ALTERNATIVES**

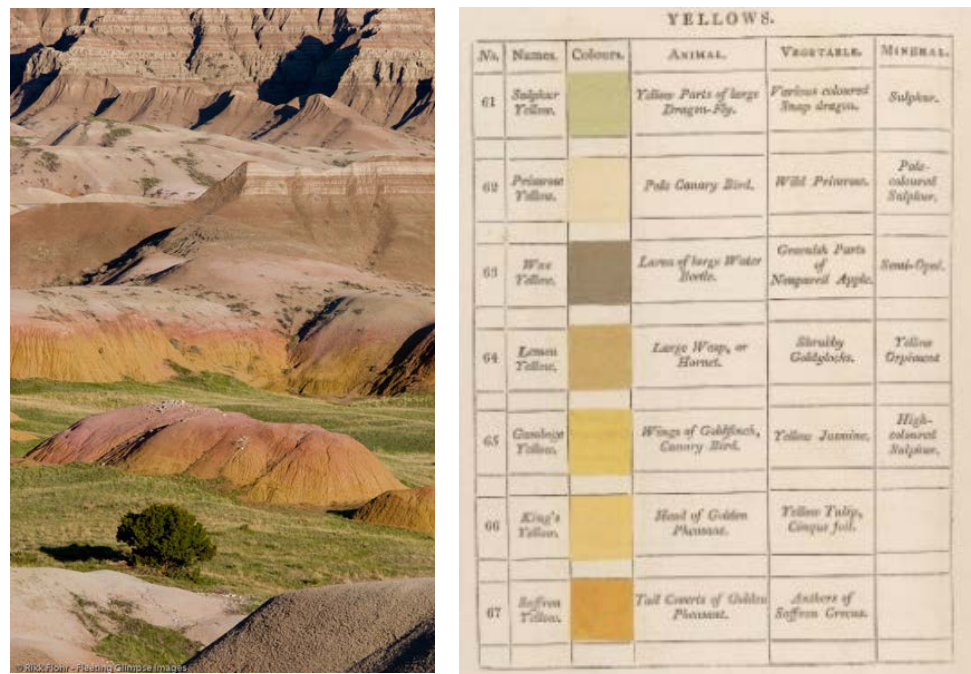
Three concepts shape the approach to future development in the Cedar Pass area: the Cedar Pass context, contemporary relevance, and a memorable visitor experience. Each of the action alternatives take a different approach to incorporating these concepts into the proposed site plans and facility configurations.

### **THE CEDAR PASS CONTEXT**

All of the action alternatives would update existing facilities through either renovation or new construction. The design of these facilities would respond to the climate, landscape, and cultural heritage of the Badlands including existing development patterns, notably the clustering of facilities and functions to minimize natural resource impacts, emphasis on grand views and vistas of park resources, and the visitor experience. Strategies for renovation or new construction of facilities would be sensitive to the geology, hydrology, cultural landscapes, and scenic values of the Cedar Pass area, particularly the spectacular views of the Badlands Wall. The action alternatives would ensure the comfort and enjoyment of visitors by planning for facilities that create an intimate experience of the landscape for visitors, while updating facilities to accommodate a greater diversity of visitor experiences. Climate appropriate siting, building massing, and stormwater management strategies would seek to preserve or restore the natural surface water flows and erosion processes that created the Badlands landscape while proposing resilient facilities to address the potential for increasingly intense precipitation and storm events. The program and design of facilities would offer refuge from severe weather in shelters and would make use of external spaces to respond to the need for shade, protection from wind and precipitation, and to expand opportunities for outdoor program space. The architecture of proposed facilities would make the landscape and geologic features the primary element in any vista and would harmonize with the setting through the use of materials and finishes that are drawn from the natural materials and colors of the Badlands such as rock formation, animals, and plants as shown in figure 3.

### **MEMORABLE VISITOR EXPERIENCE**

Visitor expectations for high quality architecture have evolved, and Mission 66 facilities have been replaced in numerous national parks, including the Craig Thomas Discovery and Visitor Center at Moose District at Grand Teton National Park (figure 4), Old Faithful and Canyon Lodge in Yellowstone National Park, and the Homestead National Monument. Under all action alternatives, the National Park Service would renovate existing facilities or construct new facilities to emphasize visitor flow, orient visitors to views of the resource, and provide context-sensitive architectural expression to create a 21st century visitor experience at Cedar Pass that recognizes the changing expectations, number, and resource impact of visitors.



SOURCE: NPS (LEFT); WERNER'S TAXONOMY OF COLORS (RIGHT)  
Note: The photograph on the left demonstrates the natural materials and colors of the badlands, while the image on the right shows the color palette derived from the animals, plants, and minerals found within the Badlands landscape.

FIGURE 3: THE BADLANDS LANDSCAPE AND DERIVED COLOR PALETTE



SOURCE: NPS

FIGURE 4: CRAIG THOMAS DISCOVERY AND VISITOR CENTER, 2018

The action alternatives would create a memorable visitor experience that incorporates some aspects of the Mission 66 principles of resource focus, efficiency, and spatial organization, while creating a Cedar Pass development that signals the importance and value of the park's resources. Architectural features that allow the landscape and the geologic features to be the primary element in any vista were the hallmark of the Mission 66 Cedar Pass, as shown in figure 5, creating a memorable visitor experience that all alternatives would strive to achieve. Restoration and expansion of park facilities to reduce congestion, improve functionality, and provide a comfortable and updated visitor experience are necessary to create a Cedar Pass that recognizes the resource-focus of the original strategy while accommodating the increased number and diversity of park visitors. The action alternatives would use siting and building massing to emphasize the built environment as an integral part of a memorable visitor experience. Historic preservation and new buildings that are sensitive to the context of Cedar Pass would be balanced in each action alternative to create a unique and impressive vision for future development of the Cedar Pass area.



SOURCE: NPS

**FIGURE 5: BEN REIFEL VISITOR CENTER, 1959**

## **DESIGN PRINCIPLES**

Each of the action alternatives is organized around a unifying design theme. The following design principles would apply to all action alternatives and guided the development of the proposed development scenarios.

## **Cultural Resources**

With the exception of the demolition of the Ben Reifel Visitor Center under alternative 3, and the renovation and demolition of the Cedar Pass Lodge under alternatives 3 and 4, respectively, the development scenarios proposed in each action alternative would comply with the Secretary of the Interior's *Standards for the Treatment of Historic Properties, Guidelines for the Treatment of Cultural*

*Landscapes*; Director's Order 28: *Cultural Resource Management Guidelines* (NPS 1998); and all applicable local, state, and federal codes, regulations, and policies.

Each action alternative would follow the recommendations of the rehabilitation treatment in the cultural landscape report (see "Chapter Seven, Treatment Recommendations") to preserve the essential character-defining features of the cultural landscape (John Milner Associates 2005). All of the action alternatives would provide some level of protection for the historic fabric of Cedar Pass and the relationship between the landscape and the built environment. New development would (1) be limited to critical park needs, (2) protect open space and natural systems, (3) occur within defined and distinct clusters of development sites, and (4) be compatible with the cultural landscape.

Building plans for both new and renovated structures would be compatible with the architectural characteristics of the remaining Mission 66-era historic structures but would place a greater emphasis on local context and design imperatives for sustainability. Existing architecture at Cedar Pass interprets the International Style of architecture, which is devoid of regional characteristics and focuses on rational problem solving and avoidance of ornamental traditional styles that mask the modern construction technology. Some of the features applied in the Mission 66-era facilities and later renovations do not respond to the climate, landscape, or the cultural heritage of the Badlands. Future development at Cedar Pass would replace these obsolete architectural features with context-sensitive, forward-looking architectural elements.

Additionally, new construction or renovation would incorporate the principles of ecotourism to the extent feasible. The International Ecotourism Society defines ecotourism as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" (TIES 2018). The ecotourism principles that would be incorporated into each action alternative would include, but would not be limited to, delivering memorable interpretive experiences to visitors, designing and constructing low-impact facilities, and working in partnership with Native American tribes. The design language used in renovations or new construction would grapple with how local cultural ideals and motifs are integrated into modern formats in consultation with artists and artisans of the local community.

## **Accessibility**

The Architectural Barriers Act Accessibility Standard (ABAAS) is the implanting standard for the Architectural Barriers Act (ABA). The Architectural Barriers Act provides accessibility requirements for federal buildings and programs, similar to the way the Americans with Disabilities Act Accessibility Guidelines serve the private sector. For construction or alteration of federally owned facilities, compliance with the Architectural Barriers Act Accessibility Standard is required if the construction or alteration commences after May 8, 2006. These requirements would be met for all newly constructed facilities proposed under the development concept plan and evaluated in this environmental assessment.

In addition to accommodations for visitors with disabilities, all parking areas, whether new construction or improvements to existing facilities, would be widened and reconfigured to improve maneuverability for large vehicles, including tour buses and recreational vehicles. These improvements, common to all action alternatives, would enable better access to the facilities they serve. All action alternatives assume that pavement striping for the driveways serving the Cedar Pass Lodge, amphitheater, bus and RV parking, and visitor center along Ben Reifel Road and Badlands Loop Road would limit vehicle travel lanes to one 12-foot lane in each direction, and that the turning radii for buses and other large vehicles would be accommodated at these intersections.

## **Sustainability**

Sustainable design concepts would be incorporated under all of the action alternatives, particularly in the construction of any new structures. The extent to which each alternative respond to the sustainability principles outlined in this section would vary. NPS's sustainable design guidelines attempt to balance human needs with the carrying capacity of the surrounding natural and cultural environments. These concepts are designed to minimize environmental impacts, the importation of goods and energy, and the generation of waste. As such, under all action alternatives new construction would meet or exceed minimum LEED Silver requirements. Maintenance would also follow sustainable practices by using green products for cleaning and following the principles of integrated pest management.

New facilities would use environmentally preferable building materials and would include features to conserve energy and water. New facilities would also incorporate materials and construction techniques that would minimize the cost of ownership, including but not limited to energy efficiency, durability, and maintainability, while using sustainable, local, and renewable materials in harmony with the landscape. Facilities would be designed to reduce harborage of rodents and insects to the extent practicable, and may include concrete slabs instead of crawl spaces, block walls, exterior stone veneers, and enclosed trash collection stations. Changes to the site layout would consolidate various uses to maximize pedestrian access, minimize the use of vehicles, and make use of design strategies that mitigate the impact of severe weather.

The type and location of building foundations would be appropriate to the soil type. Construction activities may include excavation of native soil and replacement with sand or pilings. All action alternatives would avoid siting buildings on alluvial fans and terraces at the base of the geologic formations to limit sediment accumulation in drainage areas and against building foundations. Setbacks from geologic formations depend on the size of the butte. Resiliency against intense rain events, snow, hail, and wind storms would be addressed through appropriate fenestration, drainage, maintenance access, and provision of safe rooms. Energy, water, and waste systems would not be embedded in structures and therefore easily repaired or upgraded.

Finally, the building envelopes for both new construction and renovation would support energy and water efficiency with climate-appropriate siting, orientation, façade treatments, and materials to provide (1) sun and wind protection, (2) natural light for interior illumination, (3) water harvesting, and (4) other low-impact development practices. Buildings would include windows, overhangs and shading features to appropriately mitigate solar heat gain, light, and glare. The east, south and west sides of facilities would be shaded using vegetation, arcades, colonnades, cantilevered building components, shade devices, and small non-habitable rooms such as storage and toilets that act as thermal barriers.

## **FACILITY ELEMENTS**

Many individual elements of each DCP alternative would be the same for all action alternatives. These elements are described below and are organized by functional area.

### **Visitor Center**

The design of the visitor center would provide an architectural experience worthy of a world-class park and signal the importance and value of the resources that the building interprets by emphasizing the quality of the building as an integral part of the visitor experience. The Mission 66-era spatial definition of this development cluster would be restored under all action alternatives, resulting in a cluster of buildings and spaces set within the natural landscape and organized by use with each area having an individualized scale.

The Ben Reifel Visitor Center was built in 1959 at an early stage in the evolution the Mission 66 approach to visitor center design, becoming a “Roadside America” focal point within the park and maintaining a balance between the modest and functional buildings and the landscape. This approach focused on visitor flow as the primary design driver and incorporated a standard set of experiences: approaching the information desk, discovering one's location on a map, watching a narrated slide production, visiting the museum, taking in a view, and then proceeding down the road to a major attraction. The arrival landscape—seeing, approaching, arriving, parking, and entering the visitor center—catered to automobiles as a then-new way of visiting the national parks.

In the years since its construction, the visitor center has become unable to meet the diverse needs of current and future park visitors. To provide an excellent visitor experience into the future, the visitor center and the adjacent parking and gathering spaces would accommodate ever-increasing numbers of visitors and bus groups, accommodate larger vehicles, provide additional visitor parking, and meet the larger space requirements and diverse needs of visitors. Under all action alternatives, the visitor center would improve visitor flow and enhance visitor experience by catering to a diverse set of needs; however, each alternative would take a unique approach to these improvements by favoring different aspects of Cedar Pass’s historic fabric and cultural landscape in the development approach. All action alternatives would optimize visitor flow by organizing functions in logically related spaces and maximize the view of Badlands Wall from within the visitor center. Under all action alternatives, the lobby and interpretive sales areas would be expanded to accommodate larger visitor numbers. The theater space would be updated and expanded for a variety of presentation formats. Time-constrained bus tour groups that arrive in large numbers would be accommodated by locating the drinking fountains, restrooms (accessible from both inside and outside the visitor center), and the visitor center store to accommodate their needs without impeding the experience of other visitors.

In addition to these interior enhancements, the outdoor program area associated with the visitor center would be enhanced to improve the visitor experience. These enhancements would create a more formal space for visitors to congregate and participate in interpretive programming. Improvements would maximize views of the resource, provide additional seating and outdoor classroom space, and protect visitors from inclement weather by incorporating shade shelters and wind screens. Additionally, a shaded pedestrian area featuring a picnic area and outdoor seating would provide informal gathering spaces for visitors under all action alternatives. The location of the outdoor visitor and program areas would vary by alternative.

The park conducted a space planning study to identify a program for the visitor center that would accommodate the elements of the visitor experience described above. The visitor center program includes public spaces for orientation, information, restrooms, and interpretation and outdoor program areas for the public in 13,015 square feet (SF). It also includes a break room, restroom, storage, staff workspaces, and a server room in 1,781 SF for 14 NPS staff plus 125 visitor parking spaces and 20 staff parking spaces with 7 stalls for buses and 20 stalls for recreational vehicles. The functions and amenities accommodated within the visitor center program are described in the following sections. The elements of the visitor center program are common to all action alternatives and are listed in table 1. A detailed table of the visitor program elements and their associated square footage is provided in appendix B.

TABLE 1: VISITOR CENTER PROGRAM

Function	Staff	Parking	Size
<b>Public Spaces</b> <ul style="list-style-type: none"> <li>▪ Orientation</li> <li>▪ Information</li> <li>▪ Restrooms</li> <li>▪ Interpretation</li> <li>▪ Outdoor Program Areas</li> </ul>	N/A	125 visitor stalls 7 bus stalls 20 RV stalls	13,015 SF
<b>Staff Spaces</b> <ul style="list-style-type: none"> <li>▪ Server Room</li> <li>▪ Break Rooms</li> <li>▪ Restrooms</li> <li>▪ Storage</li> <li>▪ Staff Workspaces</li> </ul>	2 permanent staff and 12 seasonal staff	20 staff stalls	1,781 SF
<b>TOTAL</b>			<b>14,796 SF</b>

**Public Spaces.** The visitor center would include a number of functions to serve the growing number of visitors to the park and would incorporate a wider range of interpretive features. It would be organized around the following functional elements.

**Orientation.** This element includes taking in a view of the resource, looking at a map, approaching the information desk, or locating services. Under all action alternatives, these functions would be accommodated in a vestibule/covered entrance, lobby (orientation area and information desk), courtyard, or some combination of indoor and outdoor spaces and would be designed to accommodate larger visitor numbers and a variety of visitor experiences.

**Information.** This element includes obtaining maps or directions from a park ranger at the information desk, watching a presentation, or attending a class. The information function of the visitor center would be expanded under all action alternatives to include programs beyond the standard set of park experiences. Future programming would include distance-learning broadcasts against a resource backdrop, a variety of media and live presentation formats in the theater, or specialized group presentations such as junior ranger gatherings. This expanded programming would be accommodated in a classroom, a distance-learning studio, and a 150-seat theater for film and lectures with required accessible seating.

**Interpretation.** This element includes museum exhibits and other programming undertaken by park rangers and park paleontologists and would be accommodated in expanded museum exhibit space and a permanent paleontology laboratory. The paleontology laboratory, one of the park's most popular programs, staffed by paleontologists and park rangers, gives visitors the chance to watch paleontologists at work and learn more about the scientific discoveries being made at the park (figure 6).



SOURCE: NPS

**FIGURE 6: PARK VISITORS, ASSISTED BY A PARK RANGER, WATCHING A PALEONTOLOGIST AT WORK**

**Services.** Under all action alternatives, visitor services would be expanded to accommodate larger visitor numbers and diverse visitor experiences and would include vending space for interpretive material with adequate space for projected visitor numbers, restrooms accessible from indoors and outdoors, and convenient delivery points. Support spaces for the visitor center store, including the BNHA office, BNHA storage, and a mail room would also be included in the visitor center, adjacent to other visitor services. A tornado shelter with a capacity for 360 people would be incorporated within the theater to provide shelter during extreme weather events.

**Support and Staff Spaces.** Office and associated support space located in the visitor center would include staff offices for the supervisory interpretive ranger, one permanent interpretive ranger, a work area for seasonal information desk staff and fossil preparation teams, break rooms, restrooms, a server room, and a storage area for interpretive materials.

A potential functional arrangement of these elements is shown in figure 7.

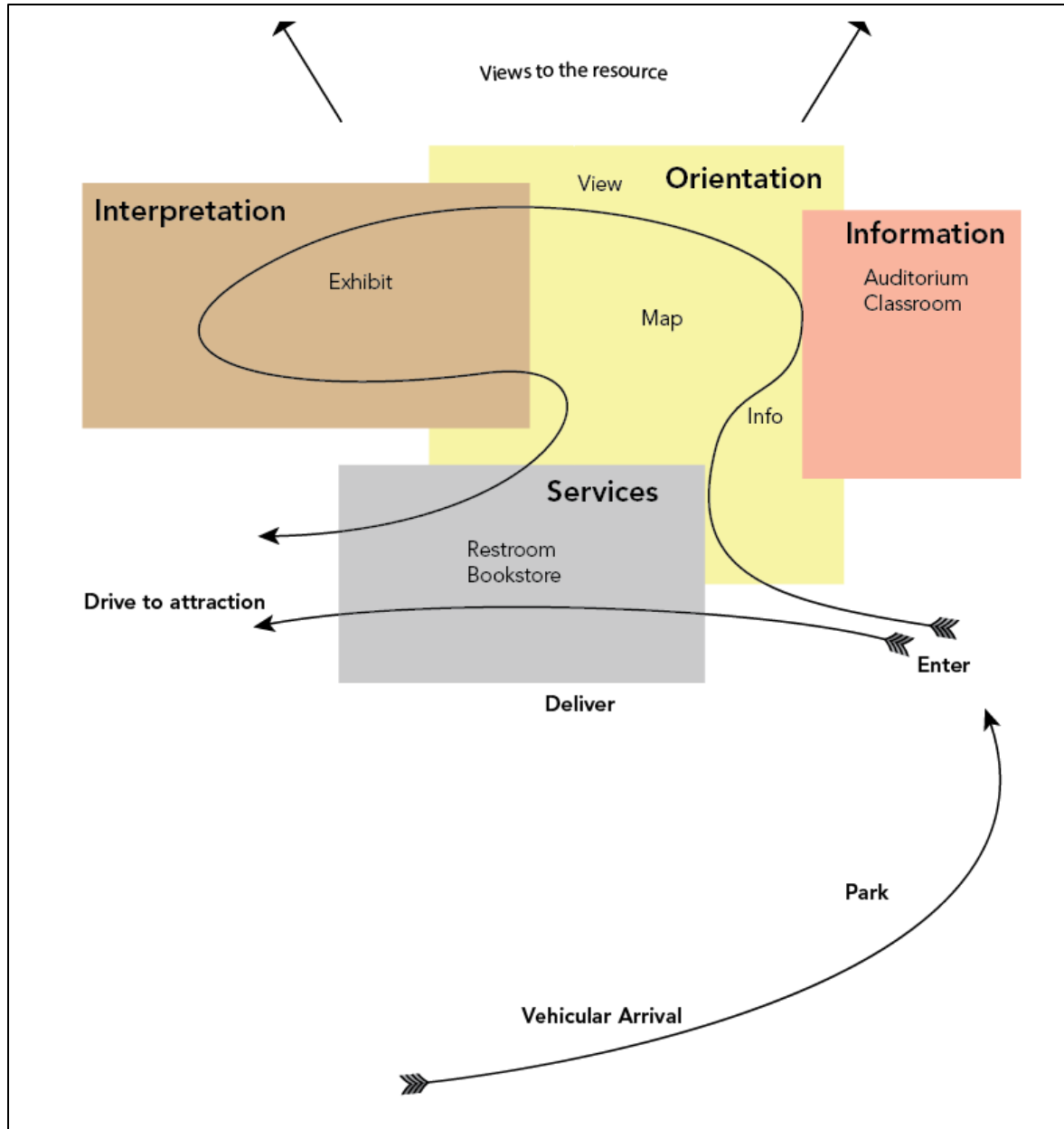


FIGURE 7: CONCEPTUAL VISITOR CENTER FLOW

## Headquarters and Administrative Functions

The National Park Service also conducted a space planning study for headquarters and administrative functions to identify the programmatic needs for these elements with the Cedar Pass area. Programmatic elements for the administrative program would be common to all action alternatives and are described below and summarized in table 2. A detailed table of the administrative program elements and their associated square footage is provided in appendix B.

**TABLE 2: ADMINISTRATION PROGRAM**

<b>Function</b>	<b>Staff</b>	<b>Parking</b>	<b>Size</b>
Administration/Management and Paleontology Teams <ul style="list-style-type: none"> <li>Staff Workspaces</li> </ul> Shared Support Spaces: <ul style="list-style-type: none"> <li>Mailroom</li> <li>Break Room</li> <li>Meeting/Conference Rooms</li> <li>Restrooms</li> <li>Storage Space</li> </ul> Special purpose spaces <ul style="list-style-type: none"> <li>Library</li> <li>Fitness Center</li> <li>Training Room</li> <li>IT Storage/Server Room</li> <li>Secure Storage/Geology Field Equipment</li> </ul>	Administration/Management Team: <ul style="list-style-type: none"> <li>1 Superintendent</li> <li>1 Deputy Superintendent</li> <li>1 Secretary</li> <li>1 Chief of Administration</li> <li>1 Chief of Interpretation</li> <li>1 Supervisory Education Specialist</li> <li>1 Education Technician</li> <li>1 Chief of Natural Resources</li> <li>1 Natural Resource Program Manager</li> <li>1 Chief of Resource Protection/Chief Ranger</li> <li>1 Chief of Maintenance</li> <li>1 FMSS Specialist</li> <li>1 Engineering Technician</li> <li>5 Administrative Support Assistants</li> <li>1 Budget Analyst</li> <li>1 IT Specialist</li> <li>1 Fee Collector (future need)</li> <li>1 Administration Office (regional staff)</li> </ul> Paleontology Team: <ul style="list-style-type: none"> <li>1 Geologist</li> <li>4 Physical Science Tech/Paleontology</li> </ul>	27 permanent staff stalls	9,900 SF
Resource Protection/Ranger Station Team <ul style="list-style-type: none"> <li>Shared Support Space</li> <li>Booking Area</li> <li>Evidence Area</li> <li>Armory</li> <li>2-vehicle Sallyport (Secure Vehicle Entry)</li> </ul>	1 Supervisory Park Ranger 2 Park Rangers 4 Seasonal Fire 2 Seasonal Law Enforcement	3 permanent staff stalls 6 seasonal staff stalls 8 motorpool/ fleet vehicles (6 vehicles currently stored in existing facility in the operational support area)	2,459 SF
Bioscience Team ("The Zoo") <ul style="list-style-type: none"> <li>Shared Support Space</li> <li>Plant Eradication Equipment (currently stored in existing facility in the operational support area)</li> <li>Wet Lab/Secure Wildlife Monitoring Equipment</li> </ul>	1 Wildlife Biologist 1 Bioscience Tech/Exotic plant management 1 Bioscience Tech 5 Seasonal exotic plant management 6 Seasonal wildlife monitoring, interns	3 permanent staff stalls 11 seasonal staff stalls	1,240 SF
<b>Total</b>			<b>13,599 SF</b>

The administrative program for the development concept plan would include a number of functions to serve the increasing number of park visitors and accommodate existing and future administrative staff, who are currently dispersed among several functionally obsolete structures within the Cedar Pass area. Included within the administrative program are the administration/management team, the paleontology team that manages the paleontological research and interpretive programs at the park, the resource protection/ranger station team that provides law enforcement and fire control services, and the bioscience team (“the Zoo”) that helps manage vegetation and wildlife within the park.

The development concept plan aims to minimize the administrative footprint to the greatest extent feasible while meeting the park’s space needs. At 13,599 SF, the administrative program represents a modest increase in the existing administrative footprint at Cedar Pass. For the purposes of this development concept plan, all action alternatives assume a building footprint approximately 10% beyond the program requirements, to provide design flexibility and to accommodate any future increases in park staffing levels or other program needs, bringing the total administrative program building footprint to approximately 15,300 SF. Under each of the action alternatives, the existing administrative trailers would be removed, and the administrative program would be accommodated in one or more permanent facilities.

**Staff Spaces.** The administrative program would include offices and workspaces for 33 permanent park employees and 17 seasonal park employees. The included positions are listed in table 2.

**Shared Support Spaces.** Certain types of spaces are needed to support the administrative functions of park employees. The administrative program includes space for one or more of the following elements: mailroom, break room, meeting/conference rooms, restrooms, storage space, and janitorial closets.

**Special Purpose Spaces.** These spaces support the health and wellness of park staff or provide necessary space to support the mission of the functions included in the administrative program. The administrative program would include space for a fitness center, library, wet lab, secure storage for wildlife monitoring and geology field equipment, storage for plant eradication equipment, training rooms, a booking area, evidence area, armory, and IT storage/server room.

**Park Facility Maintenance and Collections Management.** In addition to personnel included in the administrative program, office and support space is required for the supervisory mechanic, mechanic, mechanic’s helpers, a maintenance apprentice, 2 engineering equipment operators, heavy mobile equipment mechanic, utility system repair operator, a carpenter, and seasonal maintenance staff. The required shared support spaces are the same as those for the other administrative functions, with the addition of a locker room and garage. Under all action alternatives, those functions would remain in the existing facilities they currently occupy in the maintenance area, located approximately 0.5 mile south of the operational support area along Ben Reifel Road.

## **Cedar Pass Lodge**

The park has prepared a historic structures report for the Cedar Pass Lodge and its associated outbuildings (NPS 2018a). This report determines the extent of historic fabric, documents the evolution and captures the condition of the lodge and associated structures, and lays out multiple options for the redevelopment of the Cedar Pass Lodge area to address the substantial structural and space deficiencies of this facility. The three site design options developed in the historic structures report (ranging from reuse of historic buildings to areas of new compatible development) have been incorporated into the DCP/EA action alternatives based on how each design approach fits with the overall approach to future development under each alternative.

Similar to the visitor center and administrative functions, a program for the Cedar Pass Lodge was developed as part of the market analysis that allocates space based on identified needs and desired functional improvements. While the configuration of these elements vary by alternative, the space

devoted to each facility element is common to all action alternatives. Table 3 compares the functions and corresponding interior areas to the existing condition.

**TABLE 3: CEDAR PASS LODGE BUILDING SUMMARY**

<b>Lodge Function</b>	<b>Existing Area (SF)</b>	<b>Proposed Area (SF)</b>	<b>Change from Existing (SF)</b>
Lobby and registration space	500	1,075	+575
Kitchen	1,200	1,500	+300
Food storage	1,000	1,200	+200
Dining room	1,300	1,800	+500
Employee dining	150	400	+250
Grab-and-go food service	150	500	+350
Retail	3,850	3,500	-350
Retail storage	1,375	1,500	+125
Conference/meeting space	0	750	+750
Administrative	1,800	1,800	0
Service area (wait staff)	300	300	0
Outdoor deck/patio	0	450	+450
<b>TOTAL</b>	11,625	14,325 Interior 450 Exterior	3,150

The design options for the Cedar Pass Lodge area include notable differences; however, important commonalities would apply to all action alternatives. All design options would respect the site's natural and cultural resources and the Mission 66 approach to spatial organization for the lodge complex, and propose new development that harmonizes with its setting. The site design for the lodge complex would retain the basic form, relationships, and orientation that exist currently. All facilities would be located within previously disturbed areas that have the potential for infill development. All action alternatives would maintain the existing 1938 lodge building setback from the Badlands Loop Road, and buildings along Badlands Loop Road would be oriented toward the Badlands Wall to maximize views of the Badlands landscape. Each of the action alternatives would also include picnicking and gathering areas, designed as native grass lawns with plantings near building entries and for shade. Vegetation in the cabin court would be repaired under all action alternatives, including repairing the lawn with native species and adding cedar and deciduous trees. The drainage east of the lodge would be repaired to alleviate flooding into the complex and the cabin court. The four historic outbuildings associated with the Cedar Pass Lodge—Lodge Cottage, the laundry building, the maintenance building, and the ice house—are proposed for rehabilitation; specific treatment recommendations can be found in the historic structures report (NPS 2018a). In addition, a new approximately 1,000 SF laundry facility would be located on the south side of the maintenance building. Lastly, the cabin court and all 23 existing guest cabins would be retained under all action alternatives. New cedar and deciduous trees would be planted along Cabin Loop Road and Lodge Service Drive to provide shade and to frame and screen views in this area.

## **Park Staff Housing**

Park staff prepared a housing needs assessment to evaluate the need for housing within the park based on existing park housing stock and conducted a local market analysis to determine the amount of affordable housing units within a 60-minute commute of the Cedar Pass area (Johnson et al. 2011). Because of the park's remote location and the extremely sparse local housing stock in the local area, park staff determined that permanent and seasonal employee housing, including housing for concessioner employees should be accommodated within the Cedar Pass area of the park to the extent practicable. The assessment also notes a desire to coordinate employee housing needs with the Minuteman Missile National Historic Site, located north of the park along Interstate 90. The housing needs assessment certified a need for 11 units for permanent staff members and 38 bedrooms for paid seasonal staff members at Cedar Pass, which represents a deficit of 3 permanent units and 22 seasonal bedrooms from the existing park inventory. The majority of this need would be met within the historic housing development cluster at Cedar Pass, with some housing to be provided at the Pinnacles area and in the south unit.

Through the alternatives development process, the housing needs were further refined, and a development concept for employee housing common to all action alternatives was created. Under all action alternatives, the housing units that would be accommodated in the Cedar Pass area would be located within the historic housing development cluster at Cedar Pass, with the exception of NPS staff RV pads, available for use by permanent and seasonal park staff housed in recreational vehicles. Each concrete RV pad would measure approximately 40 feet by 20 feet. Under alternatives 2 and 3, these RV pads would be relocated from their existing location near the park headquarters area to the operational support area. Fill would be added to elevate 10 new RV pads above flood elevation, minimizing flooding and maintenance concerns caused by sediment accretion and erosion. Alternative 4 would include 7 RV pads in their current location; this option would allow staff and volunteers using recreational vehicles for housing to participate in staff life and promote a stronger sense of community.

The staff housing area at Cedar Pass would include:

- 10 permanent employee housing units in 6 historic and 1 non-historic single-family homes (including the historic superintendent's house) and 1 new triplex building;
- 12 apartments for park staff units in 3 historic buildings
- 24 new apartment units for seasonal employees in 3 new buildings.
- 15 new apartment/shared units for seasonal concessioner employees and 2 new single-family units for permanent concessioner employees in 2 new buildings.

Table 4 summarizes the amount of existing, needed, and proposed housing within the Cedar Pass area for park employees, concessioner staff, and MMNHS staff.

A variety of configurations is possible to fulfill the expanded housing program at Cedar Pass. New housing would be consistent with NPS housing prototypes and would include combinations of one, two, three, or four-bedroom units. New housing would be built to meet the Secretary of the Interior's standards for new construction, and would be compatible with the historic landscape and the character of adjacent buildings. Total new housing development sites would be limited to six sites compatible in scale to adjacent historic homes and apartment buildings. Buildings would be oriented toward views and around common outdoor spaces. Native trees would be planted in these landscape areas to provide shade and improve important viewsheds, such as that of the superintendent's house and remnant butte, which establishes the boundary of the historic housing cluster. Additional staff parking areas would be configured to minimize the visual impact on the character of the road. Intrusive and incompatible alterations to the historic road and community green within Ben Reifel Place would be removed, and the

character of the road (narrow pavement with natural drainage to landscaped margins) and recreation space restored.

**TABLE 4: EMPLOYEE HOUSING SUMMARY**

<b>Housing</b>	<b>Existing</b>	<b>Need</b>	<b>Proposed</b>
<i>Permanent Units</i>			
Park staff (including MMNHS staff)	8	12	10
Concessioner permanent staff	0	2	2
Community center and/or additional amenities	0	1	1
<i>Seasonal Units</i>			
Park staff	16	38	36
Concessioner staff	0	45	15

Under all action alternatives, the historic superintendent's house (building number 12) and garage would be restored and repurposed to their original function. The ranger station function that currently occupies this facility would be moved elsewhere within Cedar Pass; its location varies by alternative. Six contributing single-family homes and garages (building numbers 28, 29, 30, 31, 32, and 33) and three historic apartment buildings (building numbers 45, 51, and 52) would be retained and restored. One non-contributing single-family home built in 1986 (building number 46) would be rehabilitated, while one non-contributing apartment building (building number 135) would be replaced with a higher-density multi-unit building. The single-family house #34 and garage, which contributes to the national register historic district, would be rehabilitated as a community building with new amenities, including a fitness room that currently occupies part of the building 12 garage.

### **Campground and Amphitheater**

Under all action alternatives, the campground would be upgraded to accommodate modern vehicles and provide universal access. The campground would also include a larger number of campsites under each action alternative in response to increasing demand for camping at Cedar Pass. The dump station would be relocated adjacent to the entry kiosk to improve visitor flow. The group camping area would continue to contain four tent camping sites and one storage shed and would be designated tent-only camping; recreational vehicles would not be permitted to travel through the group camping area. The three existing campground comfort stations, which contribute to the national register-eligible Cedar Pass Developed Area Historic District, would remain and be evaluated and upgraded for ABA code compliance. Under all action alternatives, one additional shower facility would be added to the campground area; however, its location varies by alternative. The campground would include sites for tent camping and recreational vehicles in separate areas. The layout of the new campsites would preserve the Mission 66 character of this development cluster and provide panoramic views that immerse the visitor in the natural setting. Additionally, five camper cabins would be located within the campground development cluster. Under all action alternatives, the individual tent sites, large RV sites, and small RV sites would be separated.

The campsite configurations would be adjusted to relocate tent sites currently within the floodplain and in danger collapsing into the adjacent stream. Native trees and vegetation would be planted to slow erosion near the streambank and to provide shade and privacy for the tent sites. The tent sites currently consist of a flat tent area, grill/fire pit, picnic table, and a pull-in parking space used by a variety of vehicles, including recreational vehicles. Upgraded tent sites would vary in size depending on proximity to floodplain, vegetation, and slope, but would be sized to accommodate a family size tent, a large sport-

utility vehicle or truck, and a firepit/grill and picnic area. New sites, the number varies by alternative, would accommodate larger modern recreational vehicles and allow adequate space to maneuver these larger vehicles through the campgrounds. RV campsites would provide concrete pull-off parking for long-term durability and erosion control. All tent sites would include an elevated pad, framed with timbers and filled with sand and gravel to ensure visitor comfort and minimize ponding following precipitation events.

Under all action alternatives, the amphitheater would be reoriented to match the original Mission 66 orientation and expanded to seat 350 people and provide universal access. Additional seating would protect the buttes, which have previously served as informal seating. The amphitheater would be located a sufficient distance from the adjacent butte to avoid damaging and destabilizing the exposed bedrock and to avoid excess erosion along the base of the structure. Screening adjacent to the rear of the amphitheater would be added to block light pollution from Highway 377 during nighttime programming. The materials used in the screening (whether natural or human-made) would be determined during later design phases. A drop-off area adjacent to the amphitheater would be added, with an access aisle looping through the lot to improve vehicle flows for visitor drop off and emergency access. Fifty-four vehicle stalls would be provided at the amphitheater, a reduction of one spot from the no-action alternative. There would not be any RV or bus stalls in the amphitheater parking area.

### **Trails and Multimodal Access**

Under all action alternatives, a network of multiuse trails to accommodate nonmotorized users, including pedestrians and bicyclists, would be constructed to link development zones. In accordance with the American Association of State Highway and Transportation Officials' 2012 Guide for the development of Bicycle Facilities, these paths would be 10 feet wide, requiring the widening of some existing trails and sidewalks by approximately 4 feet (United States Access Board n.d.). The existing social trail between the employee housing area and operational support area would be formalized, and multiuse trails would be added to link the employee housing area with the visitor center and park headquarters to reduce the need for employees to use their personal vehicles to access their primary work location. Bicycle and pedestrian traffic would be separated from vehicular traffic to the maximum extent practicable to ensure visitor safety and limit potential conflicts between vehicle and pedestrian/bicycle movements. At intersections of these multiuse trails and the vehicular road network, ABA-compliant curb cuts, marked crosswalks, and signage would be installed to ensure visitor safety. All new trails and pedestrian infrastructure would be composed of concrete or stabilized soil that meet ABAAS accessibility requirements.

In addition to providing bicycle facilities as part of the multiuse trail network, a bicycle lane would be added along the south side of Badlands Loop Road through the Cedar Pass area, requiring the expansion of this road by an additional 5 feet. The bicycle lane would be demarcated by pavement markings and signage and would be located between the adjacent vehicular travel lane and the edge of the road. Bicycling would be discouraged outside the designated bicycle lane and the multiuse trails both for visitor safety and to protect park resources from accelerated weathering and erosion.

Lastly, a new interpretive trail would be built north of Badlands Loop Road. It would extend beyond the Cedar Pass area and provide a connection between Cedar Pass and external park resources. Smaller interpretive trails and outdoor program areas would be included in each development scenario, reflecting NPS goals to maximize the interaction of visitors with the park's resources and landscape and to provide high-quality interpretive programming.

## **ALTERNATIVE 2: PRESERVE AND RESTORE MISSION 66 AT CEDAR PASS**

Alternative 2 would preserve and restore the Mission 66 features to provide a visitor experience that emphasizes the “Roadside America” approach and calls attention to the views of the landscape. The approach to future development under this alternative would focus on rehabilitating existing structures consistent with Mission 66 and would limit the amount of new construction within the Cedar Pass area.

Appendix B includes diagrams of the functional arrangement of elements in the visitor center, while figure 8 shows a plan view of the facilities and infrastructure under alternative 2. Photosimulations of the visitor center, headquarters and park staff housing, Cedar Pass Lodge area, campground, and amphitheater for alternative 2 are included in appendix C. Park staff housing and the Cedar Pass Lodge elements would be the same as described under “Elements Common to all Action Alternatives.” With the exception of the two new southern tent camping loops south of the existing camping area and the NPS RV pads located south of the operational support area, all proposed development under alternative 2 would occur within previously disturbed areas.

### **VISITOR CENTER**

Under alternative 2, the Ben Reifel Visitor Center would be rehabilitated and expanded from approximately 12,000 SF to encompass approximately 15,000 SF. This alternative would restore the front of the building’s Mission 66 character. The entry sign and flagpole would be retained in their current location, and the relationship between the entry sign and the building, front parking lot, and the overall landscape would be preserved. The visitor center would be expanded with an addition on its south side. The visitor center entrance would be located on the west side of the building, adjacent to a shaded pedestrian gathering area. A large outdoor program area would be located on the east side of the facility, with expansive views of the Badlands Wall and the Badlands landscape. A shaded pedestrian connection would connect the vehicular facilities to the visitor center entrance. Deliveries to the visitor center, completed by light to medium duty delivery trucks and parcel vans, could be accommodated at either the bus drop-off area or a separate entrance on the south side of the building adjacent to the visitor center store storage and mailroom.

Alternative 2 would retain the Mission 66 era parking lot along Badlands Loop Road and include circulation and access improvements to the parking area between the visitor center and headquarters building. Under alternative 2, parking for visitors and staff would be accommodated in four lots: the Mission 66-era lot, a visitor parking lot south of the visitor center, a bus/RV parking lot on the west side of the Maintenance Road, and a separate staff parking lot. The Mission 66-era front parking lot would be widened by approximately 10 feet to increase maneuverability for large vehicles and would include 44 visitor stalls, a reduction of 10 stalls from the current configuration of this parking lot to accommodate a bus drop off. The visitor parking area located south of the visitor center would be redesigned to improve circulation and function, and to reduce the extent of asphalt pavement to minimize the visual and spatial impacts on the historic landscape. This parking lot would include 88 visitor vehicle stalls and a second drop-off area for personal vehicles. A stormwater swale would traverse the southern portion of this parking area to channel runoff towards the drainage basin between the visitor center and lodge development clusters to manage stormwater and flood risk. Three culverts would direct water under the visitor and staff parking, Ben Reifel Road, and the bus/RV parking lot. Six bus stalls and 10 RV stalls would be included in the expanded bus/RV parking lot on the west side of Ben Reifel Road.

**Badlands National Park**  
Cedar Pass Development Concept Plan & EA  
South Dakota  
**ALTERNATIVE 2**

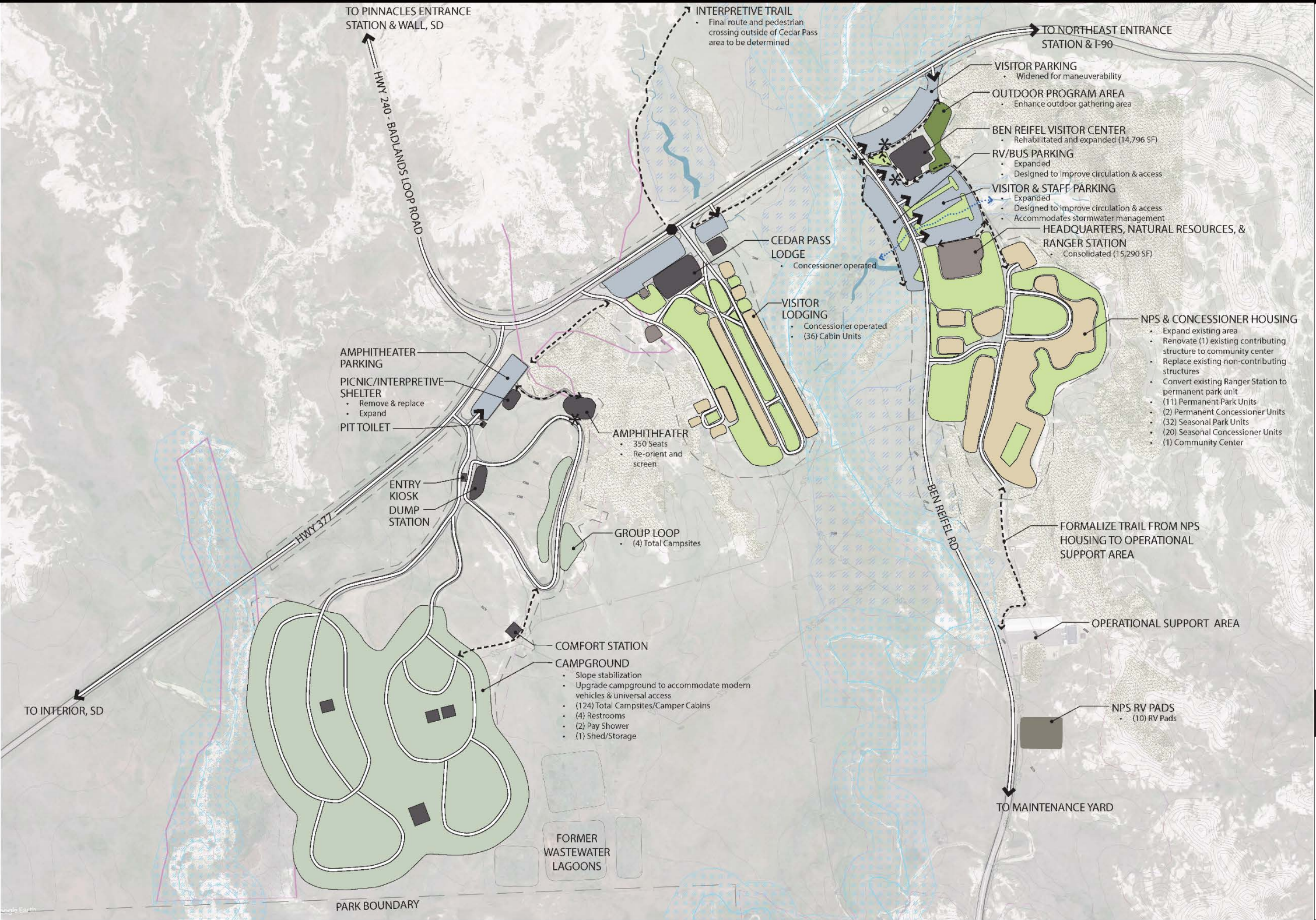
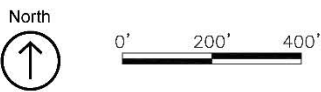
National Park Service  
U.S. Department of the Interior



**Legend**

- OPEN SPACE
- OUTDOOR PROGRAM AREA
- VISITOR CONTACT FACILITIES
- NPS SUPPORT FACILITIES
- PARKING
- HOUSING
- VISITOR LODGING
- VISITOR CAMPGROUND
- VEHICULAR ROADS
- MULTI-USE TRAILS
- DROP-OFF
- PEDESTRIAN ROAD CROSSING
- STORMWATER DRAINAGE
- PRESERVATION DEVELOPMENT ZONE
- 1 METER CONTOUR INTERVALS (CONTOUR INTERVAL ROUNDED TO THE NEAREST WHOLE NUMBER)
- 2014 FLOODED ZONE, KNOWN FLOOD RISK ZONE
- POTENTIAL FLOOD RISK
- 1951 HISTORIC STREAMS
- SOILS-FREQUENTLY FLOODED & FLOODED
- SOILS-OCCASIONALLY FLOODED
- SANITARY SEWER
- WATER
- PROPANE
- FOSSILIFEROUS OUTCROPS AND BUTTES

SOURCES: THE BACKGROUND BASE MAP IS INTENDED FOR REFERENCE ONLY. EXISTING BACKGROUND INFORMATION IS COMPRISED OF: 2017 GOOGLE EARTH AERIAL PHOTOGRAPHY, PARK PROVIDED GIS DATA & DIGITIZED MAPS, USGS GIS DATA, & CLR 2005 DIGITIZED MAPS FOR THE SURROUNDING AREAS.



**FIGURE 8: ALTERNATIVE 2: PRESERVE AND RESTORE MISSION 66 AT CEDAR PASS**

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## HEADQUARTERS AND ADMINISTRATIVE FUNCTIONS

The non-historic administrative trailers would be demolished and replaced with historically compatible new construction in the same general location. The entire administrative program would be consolidated in a new approximately 15,300-SF structure. A new staff parking lot on the south side of the stormwater swale would include 39 staff vehicle stalls.

## CEDAR PASS LODGE

The approach to future development of the Cedar Pass Lodge under alternative 2 would emphasize the rehabilitation of the Cedar Pass Lodge. Two buildings would accommodate the expanded lodge functions. The 1938 lodge building would be rehabilitated in its current location, with all later additions demolished, to accommodate approximately 12,000 SF of retail and dining functions. Retail functions would be located on the east side of the building, while dining functions would be located on the west side. The outdoor patio would be located on the west side of the building adjacent to the conference room and kitchen. The existing basement would be demolished except for the portion under the 1938 lodge that would serve as retail storage space. A second lodge check-in building to the east of the lodge, in the location of a historic building that is no longer standing, would be constructed to accommodate approximately 2,500 SF, including 1,400 SF of administrative space, 875 SF of camp lobby, and 200 SF of registration space.

Two parking areas would accommodate visitors. New asphalt paved areas north and west of the new building would contain 19 visitor vehicle stalls (including 1 accessible stall) for check-in and guest services. The existing parking area at the lodge would be retained and would continue to include three accessible visitor stalls, a 150-foot space for bus/RV parking and 37 vehicular spaces. Minor asphalt paving and striping improvements would be made. An improved asphalt paved loading area would be located at the rear of the lodge.

Under alternative 2, the cabin court would be repaired and expanded. The gravel drive would be resurfaced and expanded to accommodate a one-way drive with parking for each cabin. Lodge Service Road would be extended to a new cabin court in the area currently used for concessioner housing. It would contain 10 units in 6 new guest cabins, which would be a mix of double and cottage-style cabins as shown in table 5. These new cabins would be accessed by a center loop containing a new center green towards which the new cabins would be oriented. This new court would be oriented perpendicular to the existing cabin court to minimize disturbance to the landscape.

**TABLE 5: LODGE CABIN COMPLEX UNDER ALTERNATIVE 2**

<b>Cabin Type</b>	<b>Unit</b>	<b>Number of Beds</b>	<b>Proposed Cabins Alternative 2</b>	<b>Proposed Units Alternative 2</b>	<b>Change from No Action <sup>a</sup></b>
Cottage-style	1	6	4	4	+3
Duplex	2	4	6	12	+3
Single	1	1	20	20	0
<b>Total</b>			<b>30</b>	<b>36</b>	<b>+7</b>

<sup>a</sup> Number of buildings, number of units vary by cabin type.

## CAMPGROUND AND AMPHITHEATER

Under alternative 2, the campground and amphitheater would be improved to provide additional amenities to improve the visitor experience while minimizing changes to the transportation network and limiting the visual disruptions of vistas and views of the Badlands landscape caused by larger camping vehicles. In addition to the features described under “Elements Common to all Action Alternatives,” a drop-off point would be added on the south side of the amphitheater along the group loop road. The interpretive shelter would be demolished, and a larger structure that includes space for picnicking and an outdoor classroom would be built in the same location. The parking lot in this area would retain its current orientation and size, accommodating up to 54 visitor vehicles.

Under alternative 2, the camping area would be expanded to contain 128 campsites and cabin sites—28 electric small RV pull-through sites, 21 electric large RV pull-through sites, 70 individual tent-only sites, 4 group tent campsites, and 5 camper cabins as shown in table 6. The expanded campground program would be accommodated along 2 new loop roads south of the existing campground loops, creating two new development clusters. The configuration of the existing loops would not change. Additionally, the existing shower facility would be removed and replaced with new construction near the existing campground loops, and a new restroom and shower facility would be constructed near the new campground loops. Alternative 2 would include 4 restroom facilities and 2 shower facilities, with 16 total shower stalls.

**TABLE 6: CAMPSITES AND CABIN SITES UNDER ALTERNATIVE 2**

<b>Campsite Type</b>	<b>Existing Number of Sites</b>	<b>Proposed Number of Sites</b>	<b>Change from No Action</b>
Individual Tent (Not Electric)	92	70	-22
Group Tent (Not Electric)	4	4	0
Small RV (Electric)	0	28	+28
Large RV (Electric)	0	21	+21
Camper Cabins	0	5	+5
<b>Total</b>	<b>96</b>	<b>128</b>	<b>+32</b>

## **ALTERNATIVE 3: MINIMIZE BUILDING FOOTPRINT**

Alternative 3 would emphasize protection of the spatial definition of the Mission 66-era cultural landscape in the approach to site layout and design. Functions within Cedar Pass would be consolidated into a number of buildings in the historic visitor center/administration cluster and in the operational support area. The visitor center and some administration functions would be consolidated into single building, while other administration functions would be relocated to the operational support area to limit the development footprint in any cluster in favor of restoring the spatial definition of development clusters.

Appendix B includes diagrams showing the functional arrangement of visitor center elements for a consolidated visitor center and headquarters building. Figure 9 provides a plan view of the facilities and infrastructure under alternative 3. Photosimulations of the visitor center, headquarters and administration and park staff housing, Cedar Pass Lodge, campground, and amphitheater for alternative 3 are included in appendix C. Park staff housing and the Cedar Pass Lodge elements would be the same as those described under “Elements Common to all Action Alternatives.” With the exception of the two new southern tent camping loops south of the existing camping area and the NPS RV pads located south of the operational support area, all proposed development under alternative 3 would occur within previously disturbed areas.

### **VISITOR CENTER AND HEADQUARTERS AND ADMINISTRATIVE FUNCTIONS**

Under alternative 3, the Ben Reifel Visitor Center and a portion of the administrative program would be consolidated in a new approximately 24,700-SF building. The new consolidated headquarters and visitor center would be shifted north of the current visitor center location. The design of the visitor center would improve visitor flow and contact with the resource. The visitor center would retain its orientation along Badlands Loop Road and would provide improved views toward the resource from multiple vantage points, with only the road in the middle ground between the visitor and views of the Badlands Wall. While the entry sign and flagpole would be retained in their current location, the Mission 66 parking lot along Badlands Loop Road would be removed and potentially interpreted through a new museum exhibit to recall the ethos of “Roadside America” as a historical facet of the park experience. The visitor center entrance would be located on the west side of the building, adjacent to a shaded pedestrian gathering area. The outdoor program area would be located on the east side of the facility, with expansive views of the Badlands Wall and the Badlands landscape.

The administrative program would be housed in the southeast corner of the new building. A separate staff entrance would be located on the south side of the facility adjacent to the administrative program area. This alternative does not fully consolidate all administrative functions in one location in order to avoid adverse impacts on the cultural landscape and to provide adequate open space to restore the natural stormwater flows and floodplain, as discussed later in this section. The administration/management and paleontology teams, totaling 9,900 SF in the administrative program would be included in the consolidated visitor center and headquarters building, while the bioscience team and resource protection/ranger station team would be relocated to a new approximately 5,500-SF building in the operational support area.

Circulation and access improvements would be made to this parking area, which would encompass the area currently occupied by the administrative trailers. Visitor and staff parking would be consolidated to one expanded lot on the south side of the facility. The visitor and staff parking lot located south of the visitor center would be expanded to include 108 visitor and 39 staff vehicle stalls. Six bus and 10 RV stalls would be included in the expanded bus/RV parking lot on the west side of Ben Reifel Road. Deliveries to the consolidated visitor center and headquarters building, completed by light to medium duty delivery trucks and parcel vans, would be accommodated at the same area as the bus drop-off. Creating a separate entrance in a different portion of the building would create conflicts in the internal

organization of the building, requiring deliveries to traverse staff offices or other administrative functions on their way to the visitor center store storage area and mailroom.

Under alternative 3, previously paved/ disturbed areas within the visitor center and headquarters development cluster would be restored with natural grading and vegetation to create substantial landscape buffers between development clusters. The natural stormwater flows and floodplain between visitor center/administrative cluster and housing cluster would be restored by configuring the parking stalls in the visitor center/administrative parking lot in a compact manner and limiting the amount of parking located here. The site plan in figure 9 shows a large stormwater swale and islands of grass and other vegetation within the parking area and along Ben Reifel Road to slow down sheet flow and provide opportunities for stormwater infiltration. This approach would require up to 37 vehicle stalls to be located south of the swale and would limit the ability of the open space within this parking cluster to function as a restored floodplain. Additionally, this approach would require up to three culverts to channel water flowing off the buttes to the east into the drainage basin between the visitor center / administrative and Cedar Pass Lodge development clusters. These culverts would require ongoing maintenance to remove sediment accumulation. An alternative option for the design of this parking area would remove all vegetated islands and include all parking in one compact, contiguous parking area adjacent to the south side of the visitor center/administrative building, as shown in figure 10. Bus and RV parking would continue to be accommodated in a separate parking lot along the west side of Ben Reifel Road. This approach would increase the contiguous area of pervious land for storm and floodwater management and would reduce the number of culverts needed to manage these flows. The consolidated parking lot would accommodate 125 visitor stalls and up to 30 designated staff stalls. Twenty-nine permanent and 12 seasonal visitor center, administration management, and paleontology team staff would work in the consolidated building. This option assumes that some staff would walk from the housing area and that motor pool vehicles would be accommodated primarily at the operational support area, where the rangers and bioscience teams would be located. Under this approach, the natural flow of surface water would be fully restored and, when combined with the landscape buffer north of the housing area. The approach would provide a large vegetated area across which would slow the velocity of stormwater and floodwaters, increase infiltration and retention, and reduce the quantity of waters flowing into the drainage basin west of the visitor center. The heat island effect of a large asphalt expanse would be mitigated using “cool pavement” techniques such as high-albedo concrete pavement; stormwater and snow would be directed to a large landscaped island between the lot and the road.

**Badlands National Park**  
Cedar Pass Development Concept Plan & EA  
South Dakota  
**ALTERNATIVE 3**

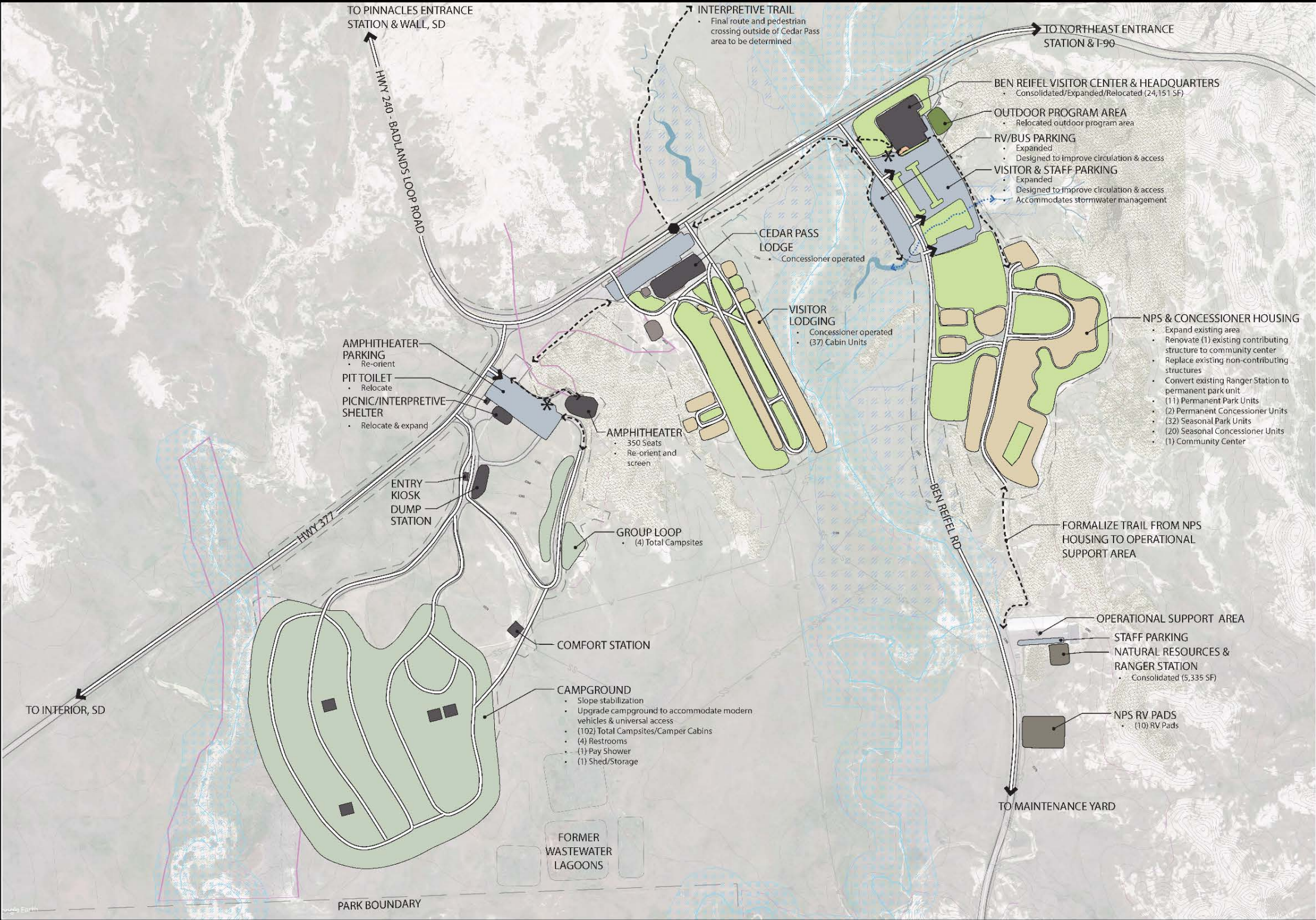
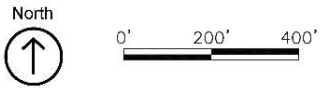
National Park Service  
U.S. Department of the Interior



**Legend**

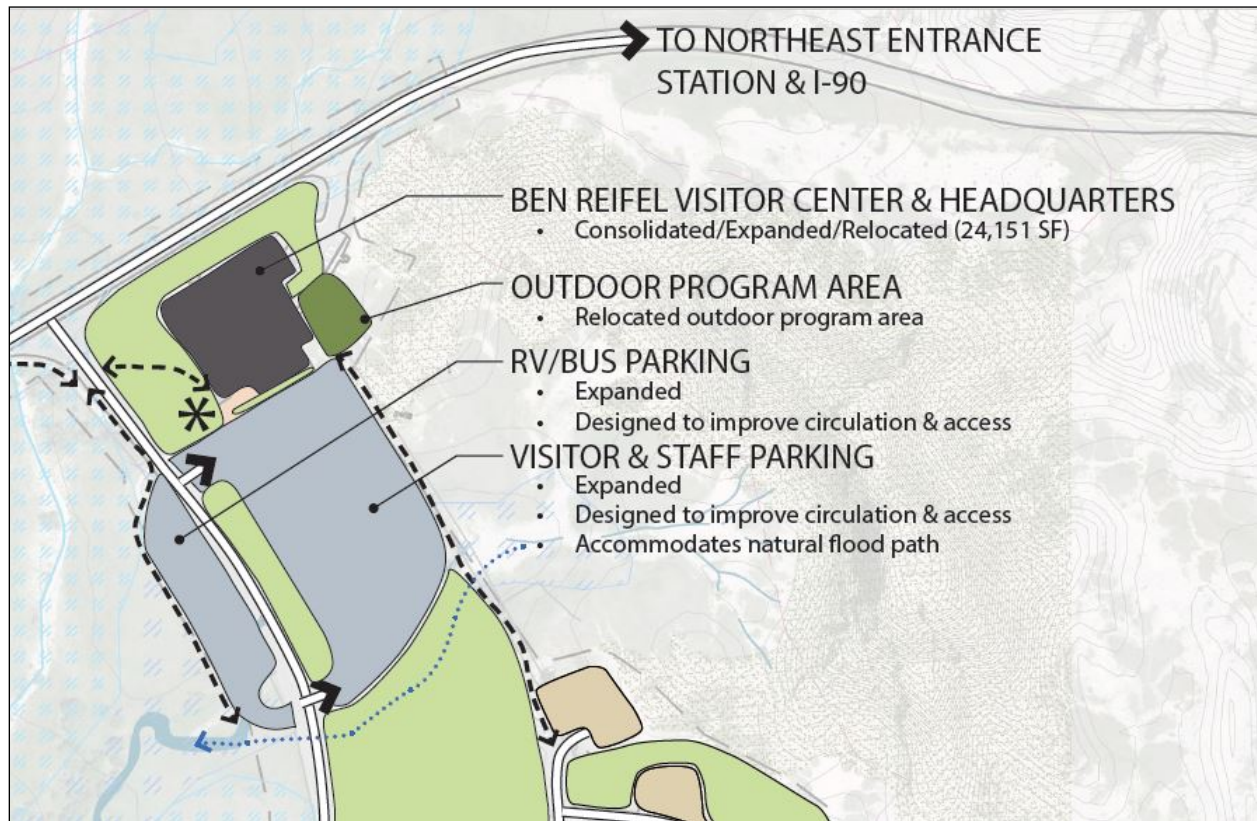
- OPEN SPACE
- OUTDOOR PROGRAM AREA
- VISITOR CONTACT FACILITIES
- NPS SUPPORT FACILITIES
- PARKING
- HOUSING
- VISITOR LODGING
- VISITOR CAMPGROUND
- VEHICULAR ROADS
- MULTI-USE TRAILS
- DROP-OFF
- PEDESTRIAN ROAD CROSSING
- STORMWATER DRAINAGE
- PRESERVATION DEVELOPMENT ZONE
- 1 METER CONTOUR INTERVALS (CONTOUR INTERVAL ROUNDED TO THE NEAREST WHOLE NUMBER)
- 2014 FLOODED ZONE, KNOWN FLOOD RISK ZONE
- POTENTIAL FLOOD RISK
- 1951 HISTORIC STREAMS
- SOILS-FREQUENTLY FLOODED & FLOODED
- SOILS-OCCASIONALLY FLOODED
- SANITARY SEWER
- WATER
- PROPANE
- FOSSILIFEROUS OUTCROPS AND BUTTES

SOURCES: THE BACKGROUND BASE MAP IS INTENDED FOR REFERENCE ONLY. EXISTING BACKGROUND INFORMATION IS COMPRISED OF: 2017 GOOGLE EARTH AERIAL PHOTOGRAPHY, PARK PROVIDED GIS DATA & DIGITIZED MAPS, USGS GIS DATA, & CLR 2005 DIGITIZED MAPS FOR THE SURROUNDING AREAS.



**FIGURE 9: ALTERNATIVE 3: MINIMIZE BUILDING FOOTPRINT**

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**FIGURE 10: OPTIONAL PARKING LOT CONFIGURATION UNDER ALTERNATIVE 3**

## **CEDAR PASS LODGE**

The approach to future development of the Cedar Pass Lodge under alternative 3 would emphasize the consolidation of lodge functions into one building that provides a compact lodge development cluster. The 14,775 SF of program space would be accommodated within the general footprint of the existing lodge building. The 1938 lodge building would be rehabilitated in its current location, with all later additions demolished. The expanded lodge program would be accommodated in a two-story addition, containing 1,800 SF of administrative space, 300 SF of retail storage, and the 400-SF employee dining room. The basement level of the lodge would contain 1,200 SF of food storage and a 750-SF conference room. The visitor dining room would be located on the east side of the building to enhance visitors' ability to view the Badlands landscape; the outdoor patio would be located adjacent to the dining room on the north side of the building. The existing parking area would be reconfigured and expanded to contain 4 accessible stalls, a 120-foot space for bus/RV parking, and 54 visitor vehicle stalls. An improved asphalt paved loading area would be located at the rear of the lodge building.

Under alternative 3, the cabin court would be repaired and expanded. The gravel drive would be resurfaced and expanded to accommodate a one-way drive with parking for each cabin. One new cottage-style cabin would be added at the east end of the cabin court. Lodge Service Road would be extended to a new cabin court in the area currently used for concessioner housing. It would contain nine units in seven new guest cabins, which would be a mix of double and cottage-style cabins as shown in table 7. These new cabins would be accessed by a Center loop containing a new center green towards which the new cabins would be oriented. This new court would be oriented perpendicular to the existing cabin court to minimize disturbance to the landscape.

**TABLE 7: LODGE CABIN COMPLEX UNDER ALTERNATIVE 3**

<b>Cabin Type</b>	<b>Unit</b>	<b>Number of Beds</b>	<b>Proposed Cabins Alternative 3</b>	<b>Proposed Units Alternative 3</b>	<b>Change from No Action <sup>a</sup></b>
Cottage-style	1	6	2	2	+1
Duplex	2	4	5	10	+2
Single	1	1	25	25	+5
<b>Total</b>				<b>37</b>	<b>+8</b>

<sup>a</sup> Number of buildings, number of units vary by cabin type.

## **CAMPGROUND AND AMPHITHEATER**

Under alternative 3, the campground and amphitheater would be improved to provide additional amenities to improve the visitor experience by updating the transportation network and increasing the amount of campsites available for recreational vehicles. In addition to the features described under “Elements Common to all Action Alternatives,” the amphitheater parking lot would be reconfigured to be perpendicular to Highway 377. A drop-off point would be added near the northeast corner of the parking lot, with a pedestrian trail providing access to the amphitheater. Vehicular access to the group loop would be removed between the amphitheater drop-off and the northernmost group tent site. The interpretive shelter would be demolished, and a larger structure, which would include space for picnicking and an outdoor classroom, would be built in south of the current location, adjacent to the parking lot.

Under alternative 3, the camping area would expanded to contain 106 campsites and cabin sites—38 electric small RV pull-through sites, 20 electric large RV pull-through sites, 39 individual tent-only sites, 4 group tent campsites, and 5 camper cabins as shown in table 8. The expanded campground program would be accommodated by extending the current loop roads to the south. These new spurs would be slightly angled to deviate from the historic layout. Additionally, the existing shower facility would be removed and replaced with new construction near the existing campground loops, and a new restroom would be constructed near the new campground loops. Alternative 3 would include 4 restroom facilities and 1 shower facility, with 8 total shower stalls. The existing pedestrian trail connecting the group loop with the southern portion of the campground would be replaced with a paved road allowing vehicular access.

**TABLE 8: CAMPSITES AND CABIN SITES UNDER ALTERNATIVE 3**

<b>Campsite Type</b>	<b>Existing Number of Sites</b>	<b>Proposed Number of Sites</b>	<b>Change from No Action</b>
Individual Tent (Not Electric)	92	38	-54
Group Tent(Not Electric)	4	4	0
Small RV (Electric)	0	38	+38
Large RV (Electric)	0	20	+20
Camper Cabins	0	5	+5
<b>Total</b>	<b>96</b>	<b>106</b>	<b>+10</b>

## **ALTERNATIVE 4: REDEFINE THE EXPERIENCE AT CEDAR PASS (NPS PREFERRED ALTERNATIVE)**

Alternative 4 would redefine the Cedar Pass experience, primarily through new facility development and facility siting choices that would optimize visitor interactions with park resources. The approach to future development under this alternative would emphasize new construction that is compatible with the Mission 66-era historic structures that would remain while incorporating state-of-the-art architectural design features and enhancing visitors' views of the Badlands Wall and other natural resources of the park.

Appendix B includes diagrams of the functional arrangement of visitor center elements for the new visitor center, while figure 11 shows a plan view of the facilities and infrastructure under alternative 4.

Photosimulations of the visitor center, headquarters and housing; Cedar Pass Lodge; campground, and amphitheater are provided in appendix C. Park staff housing and the Cedar Pass Lodge elements would be the same as those described under "Elements Common to all Action Alternatives." With the exception of the visitor center and two new tent camping loops south of the existing camping area, all proposed development under alternative 4 would occur within previously undisturbed areas.

### **VISITOR CENTER**

The visitor center function would be relocated to a new approximately 15,000-SF building on the south side of Badlands Loop Road between the Cedar Pass Lodge and existing Ben Reifel Visitor Center. This facility would maximize views of the Badlands Wall and contribute to a strong sense of place within the existing visitor facilities area. While the area proposed for the visitor center is within the Cedar Pass Development Zone between the existing visitor center and Cedar Pass Lodge development clusters, it has not been previously developed. Under this alternative, the design of the visitor center would emphasize the quality of the building as an integral part of the visitor experience. The visitor center entrance would be located on the south side of the building, adjacent to the visitor parking area. The outdoor program area would be located on the east side of the facility, adjacent to the visitor center's interior interpretive and information spaces. Large, north-facing windows would immerse visitors in the Badlands landscape. Like alternative 3, parking would not appear in the middle ground between the visitor and views of the Badlands Wall. Through the design process, the building may be configured such that interior floor of the visitor center is slightly elevated above ground level, removing Badlands Loop Road and the associated vehicular traffic from visitor views toward the Badlands Wall. Because of its proximity to the main drainage channel through Cedar Pass, additional drainage and hydrologic studies would be performed during the design of the facility to identify appropriate flood control and stormwater management strategies that would convey water away from the new facility while avoiding erosion and sediment accretion in the drainage channel, and reducing flood risks to downstream park assets such as the Cedar Pass Lodge cabins.

The visitor and staff parking associated with the visitor center would be relocated in a new parking lot that would wrap around the south side of the new visitor center building, with one ingress and egress point along Badlands Loop Road on either side of the visitor center. This parking lot would contain 129 vehicle stalls, up to 9 of which would accommodate visitor center employees. Deliveries to the visitor center could be accommodated at either the bus drop-off area or at a separate entrance on the west side of the building adjacent to the visitor center store storage area and mailroom. Bus and RV parking would be accommodated in two parking lots along Ben Reifel Road: one existing lot on the west side of Ben Reifel Road and a new parking lot on the east side of Ben Reifel Road. Together, these two parking areas would contain 6 bus stalls and 12 RV stalls. A pedestrian sidewalk or trail would connect these parking areas to the visitor center cluster.

## **HEADQUARTERS AND ADMINISTRATIVE FUNCTIONS**

With the construction of a new visitor center, the existing 12,365-SF visitor center would be renovated to accommodate a portion of the administrative program in a new headquarters building. The building's Mission 66 façade would be recreated as part of the renovation, and the relationship between the building, flagpole, and entry sign retained, as described for alternative 2. Similar to alternative 3, this alternative would not fully consolidate all administrative functions in one location. The administration/management and paleontology teams, totaling 9,900 SF in the administrative program, would be included in the headquarters building, while the bioscience team and resource protection/ranger station team would be relocated to a new approximately 5,500-SF building in the operational support area.

Under alternative 4, the outdoor program area would be moved closer to the headquarters building and converted to an outdoor space for park staff. The Mission 66-era front parking lot would be widened by 10 feet to increase maneuverability for large vehicles, and it would continue to accommodate 54 parking stalls for park staff use. A portion of these staff stalls may be allocated to visitors stopping at the historic entry sign and flagpole, which would be retained in its current location. A large expanse of open space between the headquarters development cluster and housing development cluster would serve as a landscape buffer and would partially restore the natural flow of surface water, providing a large vegetated area across which the velocity of stormwater and floodwaters could be slowed, infiltration and retention increased, and the quantity of waters flowing into the drainage basin west of the visitor center reduced.

## **CEDAR PASS LODGE**

The approach to future development of the Cedar Pass Lodge under alternative 4 would emphasize modern visitor needs while addressing current storage issues and eliminating the need for ongoing maintenance and repair of the structural issues of the existing structure. Under alternative 4, the 1938 lodge building, including all later additions and the basement would be demolished. The new main lodge, totaling approximately 12,000 SF, would be constructed in the same location as the existing lodge but with a slightly larger footprint. While the main lodge building would not contain a basement, there would be a space taller than a crawl space; with a dirt floor to allow easy access to the utility infrastructure of the building. Retail functions would be located on the west side of the building, while dining functions would be located on the east side. The outdoor patio would be located adjacent to the dining room on the east side of the building. The new lodge building would contain an enhanced visitor entryway and a separate employee entry on the south side of the building. A second lodge check-in building to the west of the lodge and the historic ice house would be constructed to accommodate approximately 2,500 SF, including 1,400 SF of administrative space, 875 SF of camp lobby, and 200 SF of registration space. Elements of the 1938 lodge would be salvaged and incorporated into the new lodge check-in building.

There would be one visitor parking area serving the Cedar Pass Lodge under alternative 4. New pedestrian sidewalks or trails would be constructed to connect the new check-in building and main lodge building to the new interpretive trail on the north side of Badlands Loop Road and visitor center, with crosswalks to enable safe passage across Badlands Loop Road and Cabin Loop Drive. The existing parking area for the main lodge building would be reconfigured and expanded to contain 3 accessible visitor stalls, 34 visitor stalls, and 30 bus/RV stalls. A more compact parking configuration under this alternative would limit the bus/RV parking area to one 120-foot space, while increasing the number of visitor vehicle stalls to 58. An improved asphalt paved loading area would be located at the rear of the lodge building.

**Badlands National Park**  
Cedar Pass Development Concept Plan & EA  
South Dakota  
**ALTERNATIVE 4 (PREFERRED ALTERNATIVE)**

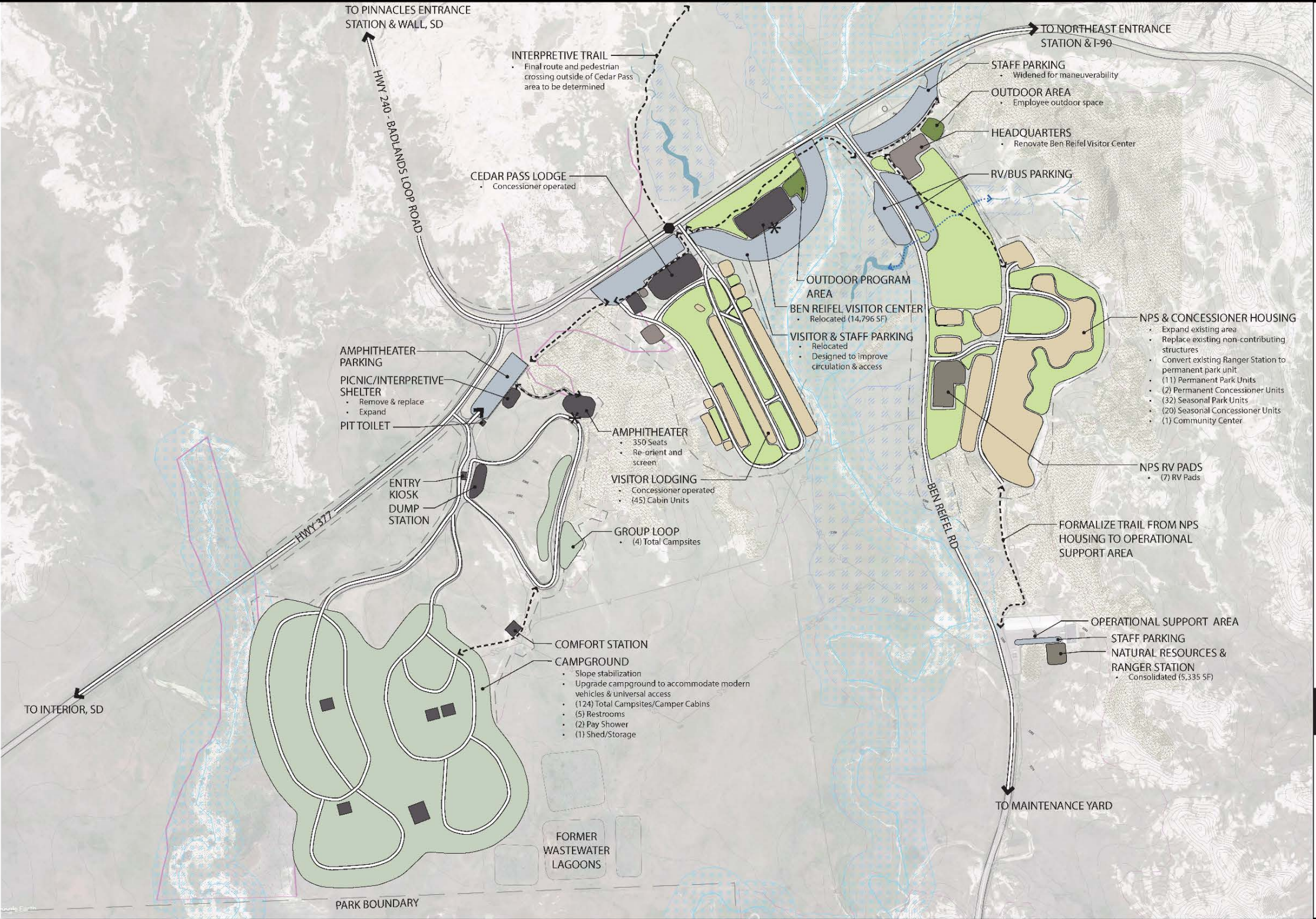
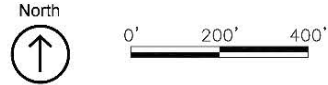
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**Legend**

- OPEN SPACE
- OUTDOOR PROGRAM AREA
- VISITOR CONTACT FACILITIES
- NPS SUPPORT FACILITIES
- PARKING
- HOUSING
- VISITOR LODGING
- VISITOR CAMPGROUND
- VEHICULAR ROADS
- MULTI-USE TRAILS
- DROP-OFF
- PEDESTRIAN ROAD CROSSING
- STORMWATER DRAINAGE
- PRESERVATION DEVELOPMENT ZONE
- 1 METER CONTOUR INTERVALS (CONTOUR INTERVAL ROUNDED TO THE NEAREST WHOLE NUMBER)
- 2014 FLOODED ZONE, KNOWN FLOOD RISK ZONE
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- 1951 HISTORIC STREAMS
- SOILS-FREQUENTLY FLOODED & FLOODED
- SOILS-OCCASIONALLY FLOODED
- SANITARY SEWER
- WATER
- PROPANE
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**FIGURE 11: ALTERNATIVE 4: REDEFINE THE EXPERIENCE AT CEDAR PASS**

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Under alternative 4, the cabin court would be repaired and expanded. The gravel drive would be resurfaced and expanded to accommodate a one-way drive with parking for each cabin. Lodge Service Road would be extended to connect to Cabin Loop Drive. A new cabin court would be located in a portion of the area currently used for concessioner housing and would contain 14 units in 10 new guest cabins, which would be a mix of double and cottage-style cabins as shown in table 9. The new cabins would be oriented toward Lodge Service Road and would be parallel to the existing cabin court. Access to the cabins would be from Lodge Service Road, which would contain a rectangular open space area along the south side, landscaped with cedar and deciduous trees. This landscaping would form a courtyard surrounded by two duplex cabins and three single cabins. An alternative arrangement would remove this rectangular courtyard and move one duplex unit from the south side to the north side of the road.

**TABLE 9: LODGE CABIN COMPLEX UNDER ALTERNATIVE 4**

Cabin Type	Unit	Number of Beds	Proposed Cabins Alternative 4	Proposed Units Alternative 4	Change from No Action <sup>a</sup>
Cottage-style	1	6	2	2	+1
Duplex	2	4	8	16	+5
Single	1	1	26	26	+6
<b>Total</b>				<b>44</b>	<b>+15</b>

<sup>a</sup> Number of buildings, number of units vary by cabin type.

## CAMPGROUND AND AMPHITHEATER

The campground and amphitheater would be improved to provide additional amenities and to improve the visitor experience, as described for alternative 2. The only difference from alternative 2 in this development cluster is that 1 additional bathroom facility would be added to accommodate 1 restroom per 25 camp sites, and 1 new shower facility would be located close to the small RV and tent sites, because larger recreational vehicles are usually equipped with their own shower facilities.

## ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

For various reasons, some alternatives or actions were initially considered but eliminated from further study. None of those alternatives or actions met the definition of a reasonable alternative, as defined by the CEQ 40 Questions, which states, “Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant” (CEQ 1981). In addition, alternatives were eliminated that did not meet project objectives, resolve need, and alleviate potentially significant impacts on important resources. The alternatives considered but dismissed, along with the rationale for dismissal in accordance with 40 CFR 1502.14, are discussed below.

## ELEMENTS OUTSIDE CEDAR PASS

The planning team discussed the wide variety of activities occurring in the park and in the surrounding communities. As part of these discussions, the team considered moving activities currently occurring in the Cedar Pass area to other locations. However, the Cedar Pass development concept plan / environmental assessment is focused on development in that area—moving functions currently within the Cedar Pass area to other areas would not meet the purpose and need of the project as defined in chapter 1.

With the exception of locating employee housing outside the Cedar Pass area, this topic was determined to be outside the scope of this development concept plan / environmental assessment.

### **MEET ALL HOUSING NEEDS AT CEDAR PASS**

Buildable sites within the housing area, which are needed for permanent and seasonal employees, are limited. Adequate space is not available to meet the park's full housing program while also accomplishing the design principals for the Cedar Pass development concept plan. This development concept plan / environmental assessment assumes that between 2 and 4 single-family units for permanent park staff, up to 8 apartment units for seasonal park staff, and 25 seasonal units for the concessioner would be located outside the Cedar Pass area. These units may be located either at Pinnacles or the south unit in the park, or in facilities not located on federal lands. If these housing units were located outside the Cedar Pass area but within the park boundary, future compliance and consultation would be completed. Therefore, this alternative was not carried forward for further analysis.

### **VARIATIONS IN THE AMOUNT OF HOUSING PROPOSED FOR PARK AND CONCESSION STAFF**

Variations in the amount of housing proposed were considered. Under the action alternatives, six areas of land are proposed for future staff housing facilities. A variety of configurations are possible to fulfill the expanded housing program. Within each renovated or newly constructed building, the number of employees that could be accommodated could be increased or decreased without changing the level of impact on the topics evaluated in this environmental assessment. Therefore, multiple variations on the amount of housing provided were not evaluated in detail. Site-specific compliance would be completed as needed prior to final housing area redevelopment.

### **MOVING THE HEADQUARTERS TO THE OPERATIONAL SUPPORT AREA**

Moving the entire administrative program to the operational support area was considered. While some developable land is available at the operational support area to accommodate these programs, this area is prone to flooding. Furthermore, the complete separation of the headquarters from the visitor center would result in operational inefficiencies and would not meet the purpose and need of the project. Because of these inefficiencies, this element was not carried forward for further analysis. However, alternatives 3 and 4 consider moving law enforcement and resource management functions to the operational support area because these functions would be more compatible with this location than other headquarters functions.

### **MOVING CAMPGROUND TO THE NORTH SIDE OF BADLANDS LOOP ROAD**

The National Park Service considered moving a portion of the campground across Badlands Loop Road as a strategy to separate different types of camping uses (i.e., to separate tent camping from larger recreational vehicles). However, this approach would create safety concerns because high volumes of recreational vehicles would need to cross the street to access the campground's amenities and amphitheater. This safety concern could be avoided by duplicating facilities on either side of the road, creating an unnecessary expense for the park. Therefore, this alternative was not carried forward for further analysis.

### **MOVING THE VISITOR CENTER TO THE NORTH SIDE OF BADLANDS LOOP ROAD**

The National Park Service considered moving the visitor center across Badlands Loop Road as a strategy to optimize views of the resource from the visitor center and orient the visitor experience inside the building toward an unobstructed view of the Badlands Wall. Through the alternatives development process, it was determined that this approach would result in the need for extensive paleontological

quarrying to recover fossils in this previously undisturbed location. This quarrying would add substantial time and expense to the construction of a new visitor center. Additionally, constructing a new visitor center on the north side of Badlands Loop Road would cut into the terrace west of the main drainage channel for Cedar Pass, destabilizing soils, speeding erosion, and increasing downstream sedimentation. This would diminish the ability of the adjacent drainage channel to transport water from the basin in which Cedar Pass is located, further increasing the potential for flooding in this area. Therefore, this alternative was not carried forward for further analysis.

### **PROVIDE ADDITIONAL AMENITIES**

During the planning process, additional amenities at Cedar Pass, such as a daycare center for park and concessioner employees or a dog kennel/boarding facility, were discussed; however, the scope of this development concept plan / environmental assessment is to identify areas for development for general park functions. Specific uses for developed areas would be further developed during plan implementation, which may include these uses. Because specific uses were outside the scope of this development concept plan / environmental assessment, these elements were not carried forward for further analysis but may be considered at a later time under a separate planning process.

### **SUMMARY OF ENVIRONMENTAL IMPACTS**

Table 10 compares the proposed development under each alternative, while table 11 provides a summary of environmental consequences for each resource area analyzed in “Chapter 4: Environmental Consequences.” Alternatives are determined to have beneficial or adverse impacts for each area of analysis. Impacts are also assessed as to whether they are short term (duration of action) or long term (greater than the duration of action).

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TABLE 10: ALTERNATIVES SUMMARY MATRIX

Element	Alternative 1: No Action	Alternative 2: Rehabilitation of Structures	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
Parking	<p><b>Visitor Center (1 lot)</b></p> <p>Visitor stalls: 54 Bus stalls: 5 RV stalls: 15 Staff stalls: 32</p> <p><b>Headquarters and Administrative<sup>a</sup></b></p> <p>Staff stalls: 37</p> <p><b>Housing</b></p> <p>Park staff stalls: 44 Concessioner stalls: 0 Flexible/community center: 0</p> <p><b>Cedar Pass Lodge (1 lot)</b></p> <p>Visitor and staff stalls: 55 RV/Bus: 0</p> <p><b>Amphitheater</b></p> <p>Visitor stalls: 55</p>	<p><b>Visitor Center (3 lots)</b></p> <p>Visitor stalls: 132 Bus stalls: 6 RV stalls: 10 Staff stalls: see headquarters below</p> <p><b>Headquarters and Administrative<sup>a</sup></b></p> <p>Staff stalls: 39</p> <p><b>Housing</b></p> <p>Park staff stalls: 43 Concessioner stalls: 22 Flexible/community center: 4</p> <p><b>Cedar Pass Lodge (2 lots)</b></p> <p>Visitor and staff stalls: 59 RV/Bus: 150 foot space</p> <p><b>Amphitheater</b></p> <p>Visitor stalls: 54</p>	<p><b>Visitor Center (1 lot)</b></p> <p>Visitor stalls: 108 Bus stalls: 6 RV stalls: 10 Staff stalls: see headquarters below</p> <p><b>Headquarters and Administrative<sup>a</sup></b></p> <p>Staff stalls: 37</p> <p>15 new staff parking stalls in operational support area</p> <p><b>Housing</b></p> <p>Park staff stalls: 43 Concessioner stalls: 22 Flexible/community center: 4</p> <p><b>Cedar Pass Lodge (1 lot)</b></p> <p>Visitor and staff stalls: 58 RV/Bus: 120 foot space</p> <p><b>Amphitheater</b></p> <p>Visitor stalls: 54</p>	<p><b>Visitor Center (3 lots)</b></p> <p>Visitor Stalls: 120 Bus Stalls: 6 RV Stalls: 12 Staff Stalls: 9</p> <p><b>Headquarters and Administrative<sup>a</sup></b></p> <p>Staff stalls: 54</p> <p><b>Housing</b></p> <p>Park staff stalls: 43 Concessioner stalls: 22 Flexible/community center: 4</p> <p><b>Cedar Pass Lodge (2 lots)</b></p> <p>Visitor and staff stalls: 56–58 RV/Bus: 30 stalls or 120 foot space</p> <p><b>Amphitheater</b></p> <p>Visitor stalls: 54</p>
Trails and Multimodal Access	Minimal formal and social trails	New interpretive trail north of Badlands Loop Road, extending beyond the Cedar Pass area Formalize existing social trail between housing area and operational support area New walking and biking trails linking the employee housing area with the visitor center and park headquarters		
Visitor Center	Maintain existing 12,365-SF structure and ancillary facilities	Visitor center renovation and expanded (approximately 15,000 SF) Enhanced outdoor program area Expand bus/RV parking on west side of Ben Reifel Road to improve circulation and access	New consolidated building to house visitor center and a portion of the headquarters program in new location north of existing visitor center, adjacent to Badlands Loop Road (approximately 25,000 SF) Portion of administrative program (bioscience team and resource protection/ranger station team) in new building (approximately 5,500 SF)	Visitor center relocated to new facility between the Cedar Pass Lodge and existing Ben Reifel Visitor Center on the south side of Badlands Loop Road (approximately 15,000 SF) Visitor and staff parking relocated and designed to improve circulation and access
Headquarters and Administrative Functions	3 headquarters structures totaling 13,484 SF 1 storage shed Separate ranger station with fitness center located in historic superintendents home	1 consolidated headquarters building and ranger station in same general location as existing temporary structures (15,890 SF)	Enhanced outdoor program area Expand bus and RV parking on west side of Ben Reifel Road to improve circulation and access	Ben Reifel Visitor Center renovated to accommodate park headquarters (12,365 SF) Portion of administrative program (bioscience team and resource protection/ranger station team) in new building (approximately 5,500 SF) Expand bus/RV parking along Ben Reifel Road to improve circulation and access.
Cedar Pass Lodge	Maintain existing structure (11,825 SF) 29 visitor lodging units	Two structures totaling approximately 14,500 SF with a new 450-SF outdoor patio adjacent to the main lodge building Structure #1: New lodge check-in building (2,500 SF) Structure #2: Rehabilitated main lodge building (12,000 SF) Small portion of lodge basement retained for storage space. 36 visitor lodging units	One rehabilitated structure totaling approximately 14,500 SF with a new 450-SF outdoor patio Expanded program accommodated in second story addition and basement 37 visitor lodging units	Two structures totaling approximately 14,500 SF with a new 450-SF outdoor patio adjacent to the main lodge building Structure #1, New lodge check-in building (2,500 SF) Structure #2: New lodge building (12,000 SF) No basement 44 visitor lodging units

Element	Alternative 1: No Action	Alternative 2: Rehabilitation of Structures	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
Amphitheater	250-seat amphitheater  Interpretive shelter and pit toilet located adjacent to amphitheater parking	Reoriented 350-seat amphitheater  Create drop-off adjacent to south side of amphitheater  Replace interpretive shelter with new expanded structure in same location  Parking lot retains current orientation and size	Reoriented 350-seat amphitheater  Create drop-off adjacent to the northeast corner of parking lot, with a pedestrian trail providing access to the amphitheater  Reconfigure circulation pattern. Construct a pedestrian trail between the drop off and the northernmost campground loop road  Relocate and expand interpretive shelter  Reorient parking lot  Relocate pit toilet	Same as alternative 2
Campground	4 group tent campsites 92 individual campsites 3 restrooms 1 shower facility 1 shed/storage	Upgrade campground to accommodate modern vehicles and universal access  Relocate dump station adjacent to entry kiosk to improve visitor flow  128 campsites/cabin sites <ul style="list-style-type: none"><li>28 small RV pull-through sites (electric)</li><li>21 large RV pull-through sites (electric)</li><li>70 individual tent-only sites (not electric)</li><li>4 group tent campsites (not electric)</li><li>5 camper cabins (electric)</li></ul> 4 restrooms 2 shower facilities 1 shed/storage	Upgrade campground to accommodate modern vehicles and universal access  Relocate dump station adjacent to entry kiosk to improve visitor flow  Replace pedestrian trail adjacent to the comfort station with paved vehicular road 106 campsites/cabin sites <ul style="list-style-type: none"><li>38 small RV pull-through sites (electric)</li><li>20 large RV pull-through sites (electric)</li><li>39 tent-only sites (not electric)</li><li>4 group tent campsites (not electric)</li><li>5 camper cabins (electric)</li></ul> 4 restrooms 1 shower facilities 1 shed/storage	Upgrade campground to accommodate modern vehicles and universal access  Relocate dump station adjacent to entry kiosk to improve visitor flow  128 campsites/cabin sites <ul style="list-style-type: none"><li>28 small RV pull-through sites (electric)</li><li>21 large RV pull-through sites (electric)</li><li>70 individual tent-only sites (not electric)</li><li>4 group tent campsites (not electric)</li><li>5 camper cabins (electric)</li></ul> 5 restrooms 2 shower facilities 1 shed/storage
Housing	8 permanent staff units 16 seasonal staff units 9 RV pads  No housing for concessioner staff or MMNHS staff	8 permanent employee housing units in 7 historic single-family homes (including the historic superintendent's house), and 1 non-historic single-family home 12 apartments for park staff units in 3 historic buildings 24 new apartment units for seasonal employees in 3 new buildings 15 new apartment/shared units for seasonal concessioner employees and 2 new single-family units for permanent concessioner employees in 2 new buildings 10 RV pads		8 permanent employee housing units in 7 historic single-family homes (including the historic superintendent's house), and 1 non-historic single-family home 12 apartments for park staff units in 3 historic buildings 24 new apartment units for seasonal employees in 3 new buildings 15 new apartment/shared units for seasonal concessioner employees and 2 new single-family units for permanent concessioner employees in 2 new buildings 7 RV pads

<sup>a</sup> Additional staff stalls provided in operational support area.

TABLE 11: SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Resource Area	Alternative 1: No Action	Alternative 2: Preserve and Restore Mission 66 at Cedar Pass	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
Stormwater and Floodplains	There would be no new impacts on stormwater and floodplains. Stormwater runoff, flooding, erosion, and sedimentation of drainage areas would continue to pose operational issues for the park.	<p><b>Stormwater</b></p> <p>Under alternative 2, there would be adverse impacts on stormwater resulting from an approximately 1.5 acre increase in impervious surfaces within the Cedar Pass area, which would increase stormwater runoff, contribute to erosion and sedimentation concerns, and reduce infiltration and ground water recharge. Additionally, the expansion of RV/bus parking area, would require stormwater to be channeled through a culvert, reducing infiltration opportunities and likely increasing sedimentation within the stormwater infrastructure.</p> <p>There would be direct and indirect, long-term, beneficial impacts resulting from the creation of a small stormwater swale in the visitor center parking area, which would increase the ability to absorb stormwater on-site.</p>	<p><b>Stormwater</b></p> <p>Under alternative 3, there would be adverse impacts on stormwater resulting from an approximately 4-acre increase in impervious surfaces within the Cedar Pass area, an increase of 1 acre over alternative 2. Impacts under alternative 3 would be similar to those described for alternative 2, but would occur over a larger area as a result of the increased impervious surface.</p> <p>The potential for increased adverse impacts would be reduced under alternative 3 by the creation of a large stormwater swale in the visitor center parking area. Alternative 3 also includes the option of creating a natural floodplain and infiltration area that would result in additional beneficial impacts.</p>	<p><b>Stormwater</b></p> <p>Under alternative 4, there would be adverse impacts to stormwater resulting from an approximately 5-acre increase in impervious surfaces within the Cedar Pass area. This is one more acre than under alternative 3. Impacts under alternative 4 would be similar to those described under alternative 3.</p> <p>There would be beneficial impacts resulting from the restoration of natural drainage patterns south of the proposed headquarters building.</p> <p>Due to the proximity of the proposed visitor center to the main drainage channel through Cedar Pass, additional drainage and hydrologic studies would be performed during the design of the facility to identify appropriate flood control and stormwater management strategies that would convey water away from the new facility while avoiding erosion and sediment accretion in the drainage channel, and reducing flood risks to downstream park assets such as the Cedar Pass Lodge cabins.</p>

Resource Area	Alternative 1: No Action	Alternative 2: Preserve and Restore Mission 66 at Cedar Pass	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
Stormwater and Floodplains		<p><b>Floodplains</b></p> <p>Under alternative 2, there would be adverse impacts on floodplains resulting from construction of a new Cedar Pass Lodge laundry building and expansion of the visitor center bus/ RV parking lot within the flood zones in the Cedar Pass area. This development would reduce the ability of the floodplain to store floodwaters, filter out nutrients and sediments, recharge groundwater aquifers, and would exacerbate flooding concerns at downstream locations.</p> <p>There would be beneficial impacts resulting from the relocation of tent sites currently within the floodplain and in danger collapsing into the adjacent stream.</p>	<p><b>Floodplains</b></p> <p>Under alternative 3, the impacts to floodplain functions and values from facility and infrastructure development would be similar to alternative 2. The bus and RV lot would be smaller than in alternative 2, reduce the functions and value of the floodplains to a lesser extent.</p> <p>The beneficial impacts would be the same as described for alternative 2. In addition, the improvements to floodwater management south of the consolidated visitor center and headquarters building would reduce downstream flooding concerns, resulting in beneficial impacts. The reorientation of the amphitheater parking lot would remove it from proximity to the frequently flooded zone, resulting in additional beneficial impacts.</p>	<p><b>Floodplains</b></p> <p>Under alternative 4, there would be adverse impacts on floodplains resulting from construction of a new Visitor Center parking lot and the construction of the Cedar Pass Lodge laundry building. This development would reduce the ability of the floodplain to store floodwaters, filter out nutrients and sediments, recharge groundwater aquifers, and would exacerbate flooding concerns at downstream locations in a similar manner to alternatives 2 and 3.</p> <p>In addition to the beneficial impact described for alternative 2, alternative 4 would restore the natural floodplain south of the proposed headquarters building by removing the majority of the existing parking lot, improving the quantity and quality of vegetation, and restoring the natural surface water flows. Culverts underneath the bus/RV parking lot and Ben Reifel Road would still be required to transport flood and stormwaters downstream.</p>

Resource Area	Alternative 1: No Action	Alternative 2: Preserve and Restore Mission 66 at Cedar Pass	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
Visitor Experience and Safety	<p><b>Visitor Experience</b></p> <p>There would be no new impacts on visitor experience. Adverse impacts would continue to occur from overcrowded campsites, congestion in the visitor center lobby and museum exhibit areas, insufficient capacity at the restaurant within the Cedar Pass Lodge during peak season, and a continued lack of pavilions and shelters for visitors gathering at the Ben Reifel picnic area.</p>	<p><b>Visitor Experience</b></p> <p>New interpretive pedestrian trails and bicycle trails would enhance visitor experience by providing enjoyable modes of travel and enhancing connectivity between visitor services and amenities located in each development cluster. The renovated visitor center would improve visitor flows, reduce congestion, and make it easier for visitors to access orientation, information, and interpretation related services and amenities. The improved Cedar Pass Lodge, reconfigured and expanded parking areas, redesigned campgrounds, and expanded amphitheater seating would substantially improve visitor amenities and enhance accessibility for visitors using large personal vehicles, recreational vehicles, or buses, resulting in long-term, beneficial impacts. However, the reduction of 5 RV stalls in the visitor center development cluster would result in direct, long-term, adverse impacts.</p>	<p><b>Visitor Experience</b></p> <p>There would be direct, long-term, beneficial impacts on the visitor experience at the visitor center, Cedar Pass Lodge, campground, and amphitheater as described under alternative 2. Alternative 3 would increase the magnitude of beneficial impacts as compared to alternative 2 by removing all features except Badlands Loop Road from the middle ground between the visitor and views of the Badlands Wall, adding 8 visitor cabins at the Cedar Pass Lodge, and including 58 RV/electric campsites. However, alternative 3 would decrease the magnitude of beneficial impacts as compared to alternative 2 by adding only 54 visitor vehicles stalls at the visitor center, three visitor vehicle stalls and a 120-foot RV parking area at the Cedar Pass Lodge, and adding only 14 new campsites to the campground area. The adverse impacts on tent campers from the loss of individual tent sites under alternative 3 would be greater than alternative 2 because</p>	<p><b>Visitor Experience</b></p> <p>Impacts on visitor experience would be similar to those described under alternatives 2 and 3. The location of the new visitor center building would provide an enhanced experience for visitors and optimize visitor views of park resources.</p>

Resource Area	Alternative 1: No Action	Alternative 2: Preserve and Restore Mission 66 at Cedar Pass	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
			only 39 individual tent sites would be retained, 31 less than under alternative 2.	
Visitor Experience and Safety	<p><b>Visitor Safety</b></p> <p>There would be no new impacts on visitor safety. Pedestrian and vehicle conflicts at the four pedestrian crossings within the Cedar Pass area would continue.</p> <p>Vehicle to vehicle conflicts along Ben Reifel Road, intersections serving the Cedar Point Lodge driveways, and along campground loop roadways would also continue.</p>	<p><b>Visitor Safety</b></p> <p>Proposed development under alternative 2 would reduce pedestrian-vehicle conflicts, resulting in direct, long-term, beneficial impacts. The redesign of parking areas serving the Ben Reifel Visitor Center would reduce the number of pedestrian-vehicle conflict locations by two. Within the Cedar Pass Lodge development cluster, there would be one additional location where pedestrian and vehicle movements would conflict, but the total length of pedestrian crossings would be reduced by 88 feet.</p> <p>Proposed development under alternative 2, including the redesign of existing parking areas and driveways serving the Ben Reifel Visitor Center, Cedar Pass Lodge, and the widening of the campground loop road, would remove all existing vehicle-vehicle conflicts, resulting in direct, long-term, beneficial impacts.</p>	<p><b>Visitor Safety</b></p> <p>There would be direct long-term, beneficial impacts to visitor safety under alternative 3. Redesign of the visitor center parking area and sidewalk system would reduce the number of potential vehicle-pedestrian conflict locations from four pedestrian crossings to one and dramatically reduce larger-size vehicle conflicts through an improved circulation pattern and consolidated parking area, which would be a noticeable increased benefit from alternative 2. The Cedar Pass Lodge parking area, campground, and amphitheater development would result in the same impacts on visitor safety as described under alternative 2. The one-way drive serving the cabins would improve vehicle and pedestrian safety. Direct, short-term, adverse impacts during construction would be the same as those presented under alternative 2.</p>	<p><b>Visitor Safety</b></p> <p>The number of pedestrian-vehicle conflict locations would be reduced along Ben Reifel Road because of the relocation of visitor center and bus/RV parking areas; however, a new pedestrian-vehicle conflict area would be created at the intersection of the new bus/RV parking lot driveway and Highway 240. The Cedar Pass Lodge parking area, campground, and amphitheater development and the one-way drive serving the cabins would result in the same impacts on visitor safety as described under alternatives 2 and 3.</p>

Resource Area	Alternative 1: No Action	Alternative 2: Preserve and Restore Mission 66 at Cedar Pass	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
		<p>Vehicle to vehicle conflicts caused by larger vehicles would be minimized through parking lot and road widening, and designing intersections to accommodate the turning radii of larger vehicles.</p> <p>Lastly, the redesign of parking and access for the Ben Reifel Visitor Center, widening of the campground loop roads, and improvements to the amphitheater parking lot would improve access for emergency vehicles by providing more space for emergency vehicle to maneuver</p>	<p>Lastly, alternative 3 would contribute appreciable beneficial direct long-term impacts on the overall cumulative effects to visitor experience and safety.</p>	
Cultural Landscapes	<p>There would be no new impacts on elements of the Cedar Pass Cultural Landscape. Contributing landscape elements, including structures, circulation, and natural systems would continue to be adversely affected by the lack of upgrades to facilities to meet increased visitation.</p>	<p>Proposed development would adhere to the rehabilitation treatment in the cultural landscape report; preserving the integrity and character of the cultural landscape, and resulting in beneficial impacts on cultural landscapes.</p>	<p>Beneficial impacts on the cultural landscape would be the same as described under alternative 2. However, alternative 3 would also result in direct, long-term, adverse impacts from the demolition of the historic Ben Reifel Visitor Center and Mission 66 parking lot and the addition of a second story to the Cedar Pass Lodge.</p>	<p>Beneficial impacts on the cultural landscapes would be the same as those described under alternative 2. However, alternative 4 would also result in direct, long-term, adverse impacts from the demolition of the Cedar Pass Lodge.</p>

Resource Area	Alternative 1: No Action	Alternative 2: Preserve and Restore Mission 66 at Cedar Pass	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
Historic Structures	There would be no new impacts on historic structures. The visitor center and the Cedar Pass Lodge would continue to degrade due to lack of repair and upgrades to meet increased visitation.	All proposed alterations to historic structures, including the Ben Reifel Visitor Center, Cedar Pass Lodge, and historic housing units would adhere to the rehabilitation treatment in the cultural landscape report as well as Secretary of the Interior's <i>Standards for the Treatment of Historic Properties</i> , which would result in beneficial impacts.	Many of the proposed alterations to historic structures, including the Cedar Pass Lodge and historic housing units would result in beneficial impacts as described for alternative 2. However, adverse impacts would result from the demolition of the historic Ben Reifel Visitor Center and the second-story addition to the Cedar Pass Lodge, which would alter a historic structure in a manner inconsistent with the historic context of Cedar Pass.	Most of the proposed alterations to historic structures, including the Ben Reifel Visitor Center and historic housing units would result in beneficial impacts as described for alternative 2. Demolition of the Cedar Pass Lodge and its replacement with compatible new construction would result in adverse impacts.

Resource Area	Alternative 1: No Action	Alternative 2: Preserve and Restore Mission 66 at Cedar Pass	Alternative 3: Minimize Building Footprint	Alternative 4: Redefine the Experience at Cedar Pass
Paleontological Resources	<p>There would be no new impacts on paleontological resources. Paleontological resources would continue to be managed in accordance with the park's paleontological resource management policies.</p>	<p>The ground disturbance and excavation proposed under alternative 2 would result in adverse impacts on any extant paleontological resources in the affected areas by unearthing these resources. The risk of affecting intact paleontological resources is highest in the new tent camping loops and the proposed RV pads because these areas have not been previously disturbed.</p> <p>All areas subject to excavation would require pre-construction surveys for paleontological resources. All construction activities would be appropriately monitored, which would reduce the potential for adverse impacts.</p> <p>Indirect, adverse impacts could result from changes in the drainage patterns caused by proposed development, which could expose paleontological resources through erosion processes.</p>	<p>Similar to alternative 2, the ground disturbance and excavation proposed under alternative 3 would result in adverse impacts on any extant paleontological resources in the affected areas by unearthing these resources, notably in the previously undisturbed areas described under alternative 2. Mitigation measures to reduce potential impacts would be the same as those described for alternative 2.</p> <p>Indirect adverse impacts would be the same as those described for alternative 2.</p>	<p>Similar to alternatives 2 and 3, the ground disturbance and excavation proposed under alternative 4 would result in adverse impacts to any extant paleontological resources in the affected areas by unearthing these resources. The risk of affecting intact paleontological resources is highest in the previously undisturbed areas described for alternative 2, as well as the new visitor center, located in an undeveloped area between the existing visitor center and Cedar Pass Lodge. Mitigation measures to reduce potential impacts would be the same as those described for alternative 2.</p> <p>Indirect adverse impacts would be the same as described for alternative 2.</p>

## MITIGATION MEASURES FOR THE PROPOSED ACTION

The National Park Service places strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, the following protection measures would be implemented as part of the proposed action.

### GENERAL

- Clearly state all resource protection measures in the construction specifications and instruct workers to avoid conducting activities outside the project area. Limit disturbances to roadsides, culvert areas, and other areas inside the project area.
- Hold a preconstruction meeting to inform contractors about sensitive areas, including natural and cultural resources.
- Delineate construction zones outside existing disturbed areas with flagging and confine all surface disturbance to the construction zone.
- Site staging and storage areas for construction vehicles, equipment, materials, and soils in previously disturbed or paved areas approved by the National Park Service. Locate these areas outside high visitor use areas and clearly identify them in advance of construction.
- Require contractors to properly maintain construction equipment to minimize noise and do not allow construction vehicle engines to idle for extended periods.
- Remove all tools, equipment, barricades, signs, and surplus materials from the project area upon completion of the project.

### STORMWATER AND FLOODPLAINS

- Incorporate alternative pavement treatments, such as pervious concrete, porous asphalt, permeable pavers, or cellular grassed paving in a concrete or plastic matrix to improve stormwater infiltration and reduce run-off.
- Comply with and meet all relevant requirements under the Clean Water Act, Executive Order 11988, Director's Order 77-2, and NPS *Management Policies 2006*, as well as all other applicable regulations and policy guidance, including management of stormwater-related non-point source pollutants under the National Pollutant Discharge Elimination System. Prepare and implement a stormwater pollution prevention plan for construction activities to control surface runoff, reduce erosion, and prevent sedimentation of surface waters.
- Create a stormwater management plan during the design process to include more detailed hydrologic studies and drainage plans for new construction, as well as additional avoidance, minimization, and mitigation measures based on future engineering and design work.
- Incorporate new facilities and infrastructure into the existing storm water drainage system.
- Implement best management practices for drainage and sediment control to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. These practices may include, but are not limited to, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas to minimize sedimentation and turbidity impacts as a result of construction activities. Do not use plastic materials. Leave erosion control measures in place

at the completion of construction to avoid adverse impacts on water resources, after which time NPS staff would be responsible for maintenance and removal.

- Perform construction activities with caution to prevent damage caused by equipment, erosion, siltation, or pollutant discharges.
- Complete and implement a spill prevention, control, and countermeasures plan for any fuel storage tanks that meets all applicable standards for construction and leak detection. Limit areas used for refueling to areas where these activities currently occur.
- Frequently check equipment containing fuels for leaks.
- Install infiltration basins or other appropriate stormwater management and low impact development practices, to control the additional stormwater runoff caused by the increase in impervious surfaces.

## **PALEONTOLOGICAL RESOURCES**

- Conduct pre-construction surveys by a paleontologist prior to excavations into the Brule Formation for all foundations of expanded and new buildings in the project area, in accordance to *NPS Management Policies 2006* (NPS 2006b) and the *North Unit General Management Plan* (NPS 2006a). Through this process, paleontological resources would be documented, collected, and properly cared for before construction begins (NPS 2006b).
- Implement a construction monitoring program area for all construction activities in the Cedar Pass Area (Benton et al. 2014). If resources were discovered during construction, work in that location would be stopped until the resources are properly recorded and evaluated. Appropriate measures would be taken to avoid further resource impacts or to mitigate their loss or disturbance.
- Reduce stormwater runoff from the new and rehabilitated facilities and associated parking areas to the extent possible by appropriate best management practices to avoid erosion that could affect paleontological resources.
- Provide appropriate drainage of the area between the expanded amphitheater and the base of the adjacent butte to avoid an increase in erosion and an increased risk of landslides of the butte wall.
- Implement appropriate educational, monitoring, law enforcement, and other management activities to mitigate the risk of intentional and unintentional disturbance within the Cedar Pass area.

## **VISITOR EXPERIENCE AND SAFETY**

- Require the construction contractor to follow NPS construction contract standards during construction, including implementation of an accident prevention program, installation of warning signs at the construction site and along the nearby parking lot, and installation and maintenance of construction fences around the construction sites to prevent non-contractors and the public from entering the construction areas.
- Inform visitors in advance of construction activities via a number of outlets, including the park's website, various signs, the visitor center, and bus and shuttle drivers.
- To the extent practical, schedule work to avoid construction activity and construction-related delays during peak visitation.

- Ensure that pedestrian crossings in parking lots and driveways have appropriate signage and pavement striping to minimize the potential for pedestrian-vehicle conflicts (alternatives 2, 3, and 4).
- Develop provisions for emergency vehicle access through construction zones.
- Implement either a flashing pedestrian sign or LED-illuminated sign for the proposed crosswalk at Highway 240 (Badlands Loop Road) to ensure safe passage for pedestrians along this heavily traveled roadway serving tourists and local farm trucks (alternatives 2, 3, and 4).
- Develop pedestrian walkways/trails around parking areas at Cedar Pass Lodge and amphitheater to provide safe passage for pedestrians past these parking lots (alternatives 2, 3, and 4).
- Add a pedestrian walkway/trail adjacent to proposed visitor and parking area serving the new Ben Reifel Visitor Center that connects the visitor center to the bus/RV parking area and include a flashing pedestrian sign or LED-illuminated sign at a Highway 240 crossing and bus/RV parking lot crossing to improve pedestrian safety (alternative 4 only).
- Develop pedestrian walkways/trails within and between campsites and the amphitheater to provide an interconnected pedestrian network between the campsites and visitor center.
- Implement a parking management plan to reduce vehicle use by employees by providing one parking space in a central location at Cedar Pass and encouraging employees to walk or use a bicycle to access their work location at Cedar Pass or use a motor pool vehicle if their work location is more than a 0.5 mile away (10-minute walk). Experiment by reducing the number of employee spaces below a 1:1 ratio to reduce the number of non-tourist vehicles accessing the park and assign an area to handle the overflow until the right balance of parking demand and capacity are equal (all alternatives).
- Require that all tourist bus companies schedule their arrivals and departures to minimize tour bus traffic and help the park ensure that available parking matches the daily tour bus peak demand (all alternatives).
- Create a one-way flow through parking areas serving the Cedar Pass Lodge parking area and parking area located north of existing visitor center to reduce confusion for drivers and pedestrians and provide a safer environment (all alternatives).

## **CULTURAL LANDSCAPES**

- No mitigation measures for cultural landscapes are anticipated; however, mitigation measures may be determined as part of the section 106 process

## **HISTORIC STRUCTURES**

- Engage a qualified architectural historian to document historic or important structures (e.g., Mission 66 era) before demolition or alteration, if necessary.
- Oversee every stage of construction activities to ensure that the historic fabric is not unduly disrupted by the contractors.
- Ensure that any architectural development in the Cedar Pass area is compatible with the historic structures or any historic district that is proposed, as appropriate.
- Conduct on-going tribal consultation for the proposed undertaking.

- Appropriate measures to mitigate any adverse impacts under the selected alternative would be identified through consultation with the South Dakota state historic preservation office under section 106 of the National Historic Preservation Act.
- Salvage elements of the 1938 lodge and incorporate in the construction of a new lodge check-in building.

## **NATIONAL PARK SERVICE PREFERRED ALTERNATIVE**

The preferred alternative is the alternative that “would best accomplish the purpose and need of the proposed action while fulfilling [the NPS] statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors” (46.420(d)). The preferred alternative ultimately may not be the selected alternative and identification of the preferred alternative is not a final agency decision.

The National Park Service has identified alternative 4 (Redefine the Experience at Cedar Pass) as the preferred alternative in this development concept plan / environmental assessment. because it best balances the ability of the National Park Service to achieve the project’s purpose and need, most notably the needed improvements to the visitor experience and facilities for NPS staff, with the preservation and enhancement of the natural systems, spatial organization, historic buildings, and views and vistas that compose the cultural landscape in the Cedar Pass area.

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## **CHAPTER 3: AFFECTED ENVIRONMENT**

The “Affected Environment” chapter describes existing conditions for those elements of the human environment that would be affected by the implementation of the alternatives considered in this development concept plan / environmental assessment. The components addressed include stormwater and floodplains, visitor use and safety, cultural landscapes, historic structures, and paleontological resources. Impacts for each of these topics are analyzed in “Chapter 4: Environmental Consequences.”

### **STORMWATER AND FLOODPLAINS**

The badlands are an evolving landscape formed in part by the processes of erosion and deposition caused by the overland flow of water. Therefore, the movement of storm and floodwaters across the landscape is an important consideration for the development of infrastructure and facilities within the Cedar Pass area (NPS 2017a).

#### **STORMWATER**

The surface waters within the Cedar Pass area are part of the White River watershed, which drains east to the Missouri River. The park includes limited surface water resources, and only two intermittent streams are located within project area. One stream borders the western side of the campground and another runs through the open space west of the visitor center and close to the eastern side of the visitor lodging cabins. The streams generally flow from the north under Badlands Loop Road in a southerly direction, eventually discharging into tributaries of the White River. Inactive wastewater ponds are located just southeast of the campground area. Active wastewater lagoons are located approximately 0.75-mile south of the Cedar Pass area outside the project area.

No perennial surface water resources are located within the Cedar Pass area. The two existing streams are intermittent and typically only carry water following precipitation events. The drainage area for the easternmost stream in the Cedar Pass area consists of a large area of land north of Badlands Loop Road. Stormwater runoff, including discharge coming off the major geologic formations in the area, drains to the streams. Two historic washes begin north of Badlands Loop Road. One wash runs towards the lodge and visitor center while the other runs west towards the stream from the geologic formations located on the east side of the Cedar Pass area. The project area is characterized by various thin non-porous soils and shallow underlying bedrock that prevent infiltration of stormwater or snowmelt and large areas of impervious surfaces such as parking lots, roads, and buildings that contribute to the volume of stormwater runoff. The lack of infiltration results in sheet flow throughout the developed area, which is not absorbed by the soils. All precipitation ends up as direct runoff, which overwhelms local drainage-ways during high-volume precipitation events. Sheet flow through the Cedar Pass area also erodes soils and carries sediments shed from the surrounding Brule Formation downslope, creating erosion concerns for delicate prairie soils in the Cedar Pass area. Sediment accumulation in drainage areas and against building foundations is an ongoing maintenance concern, and some facilities, such as the law enforcement building, undergo regular removal of accumulated sediments and soils.

#### **FLOODPLAINS**

The Federal Emergency Management Agency has not completed a study to determine flood hazards or floodplains for the Cedar Pass area (FEMA n.d.). However, development surrounding the streams, including the park headquarters, Cedar Pass Lodge, and campground have an ongoing susceptibility to flooding risk from intense rain events on a seasonal basis, as shown in figure 12. In mid-2014, the Cedar Pass area experienced heavy rainfall that resulted in flooding (NPS, Thompson, pers. comm. 2017b).

Flooding during this event resulted from both stormwater runoff and the resulting riverine overflows. Observational evidence from the 2014 event indicated the existence of flooded zones of up to 115 feet surrounding the two streams in the project area (NPS, Thompson, pers. comm. 2017b). Areas that flooded during the 2014 storm included the Cedar Pass Lodge vicinity, many of the cabins on the southeast side of the visitor lodging, the northwestern portion of the campground, the parking lot between the visitor center and the natural resource office, and the bus parking area. Floodwater depths were approximately 8 to 10 inches in the parking lot and 12 inches at the cabins (NPS, Thompson, pers. comm. 2017b). In addition to the known flooded zones, areas of potential flood risk include the open space between the visitor center and the cabins. Flooding during the 2014 rain event also damaged and breached the wall of the western wastewater lagoon located outside the project area.

Existing channel characteristics (i.e., narrow width near the cabins) and sediment accretion in the stream channels negatively affects the ability of the streams to rapidly drain stormwater volume from the area, leading to flooding (NPS, Thompson, pers. comm. 2017b). Sediment accretion also blocks drainage culverts and other stormwater management infrastructure. In addition to contributing to the flood risk in the area, these drainage issues create the potential for flooding upstream of the Cedar Pass area. Following the 2014 flooding event, several measures were implemented to mitigate flooding in the parking lot, including constructing larger culverts, planting vegetation, and elevating the visitor center parking lot to induce sheet flow toward the open space to the west. Future flooding and associated sediment accretion in the flood zones would continue to affect the ability of the drainage-ways to effectively disperse floodwaters in the area (NPS, Thompson, pers. comm. 2017b).

## **VISITOR EXPERIENCE AND SAFETY**

The visitor experience at the Cedar Pass area is affected by the available services and amenities, as well as the transportation circulation patterns that influence the accessibility of facilities and visitor safety.

## **CIRCULATION AND ACCESS**

The park's transportation system in the Cedar Pass area is composed of roadways, parking lots, sidewalks, trails, and boardwalks. Together these systems connect the Cedar Pass area to the park's entrances and connect the Ben Reifel Visitor Center, Cedar Pass Lodge, amphitheater, and campground facilities within the Cedar Pass area.

### **Roadway System**

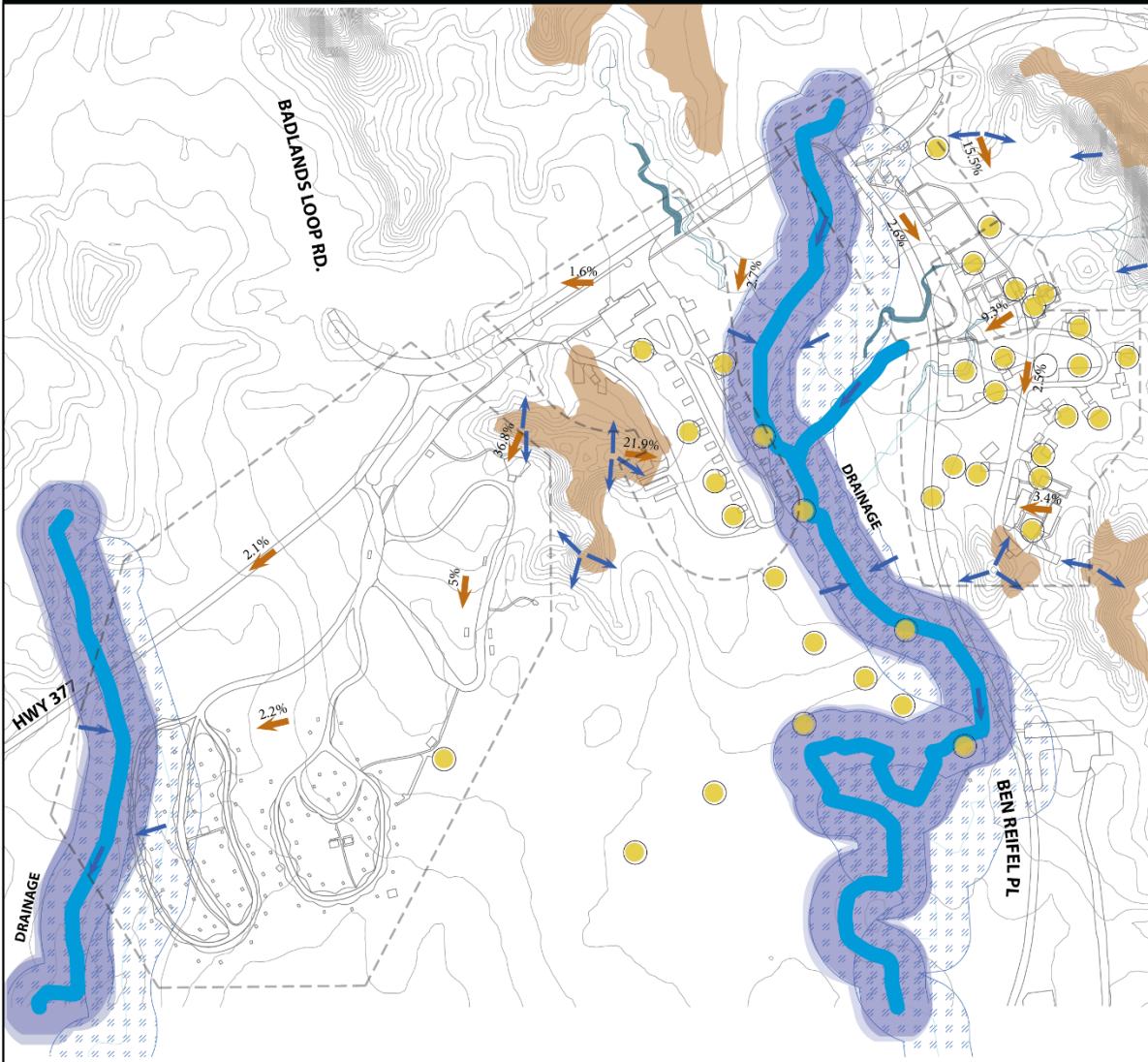
The primary roadway that serves the Cedar Pass area is Highway 240, an east-west oriented roadway that connects the Cedar Pass area to the rest of the park and regional roadway network. Highway 240 operates as a free flow, two-lane roadway with 12-foot wide travel lanes and has a posted speed limit of 25 miles per hour (mph) through Cedar Pass and 35 mph east beyond the visitor center. Within the Cedar Pass area, Highway 240 provides access to the lodge and visitor center areas.

Highway 377 is a northeast-southwest oriented roadway that connects Highway 240 and the Cedar Pass area to a park entrance near Interior, South Dakota. Highway 377 is a two-lane roadway with a 35 mph posted speed limit west of the campground and 25 mph posted speed limit east of the campground with 12-foot wide travel lanes. Within the Cedar Pass area, Highway 377 provides access to the amphitheater and campground. The Highway 240 and 377 intersection is a T intersection with one stop sign posted along the Highway 377 approach. The Highway 240 approaches operate as free flow. A gate, located west of Highway 377, can be used to close access to points west of the Cedar Pass area.

# Badlands National Park

Cedar Pass Concept Development Plan & EA  
South Dakota

National Park Service  
U.S. Department of the Interior



## Legend

- Stream
- 1951 Historic Wash and Streams
- 2014 Flooded Zone
- Slope Degree & Direction
- Manhole Drain
- Water Flow Direction
- Major Geologic Formation

Map not to scale

North

FIGURE 12: CEDAR PASS HYDROLOGIC RESOURCES

Ben Reifel Road is a north-south oriented roadway that connects Highway 240 to the Cedar Pass administration facilities, including the headquarters building, ranger station, staff housing, maintenance yard, and other park support facilities. Ben Reifel Road is a two-lane roadway with a 15 mph posted speed limit and 11-foot wide travel lanes. Similar to the Highway 240 and 377 intersection, it intersects Highway 240 at a T intersection with a stop sign posted along Ben Reifel Road.

The campground and amphitheater are served by Campground Loop Road, which intersects Highway 377 at a T intersection located approximately 400 feet southwest of the Highway 240 intersection. Campground Loop Road begins as a two-way roadway at Highway 377 and splits into two road segments approximately 400 feet from its intersection with Highway 377. The right segment, called Butte Loop, then splits into three more segments before entering the individual campsite area. The left segment, called Agate Loop, splits into two more segments before entering the individual campsite area. All segments intersect with adjacent segments, thus vehicles can continue through the campground in single direction to return to the exit and to Highway 377. A separate loop road, called Group Loop, connects to the amphitheater, group campsites, and the dump station. Once the campground roadways feed into the three parts, Butte Loop, Agate Loop, and Group Loop, they operate as one-way operation.

The parking areas serving the campground, amphitheater, Cedar Point Lodge, and visitor center all contains stop signs posted at exits. These stop signs require vehicles exiting the parking lots to wait for gaps in traffic before entering.

A number of congestion points exist within the Cedar Pass area roadway system, primarily at key intersections. These include the parking lot entrance and exits serving the visitor center and lodge, the campground loop roadway intersection with Highway 377, and the intersection of Highways 240 and 377. Congestion also occurs between vehicles and between vehicles and pedestrians along Ben Reifel Road, where tour bus parking, RV parking, and staff parking mix with pedestrians.

## **Parking**

The park contains parking areas serving the visitor center, Cedar Lodge, the amphitheater, and campgrounds. The visitor center parking areas provide parking stalls for visitors arriving by passenger vehicle, tour bus, and recreational vehicles. Spaces are also designated for park staff at the visitor center, park headquarters, ranger station, and staff housing area. A small section of staff spaces located next to the RV parking area often serve as visitor overflow spaces when needed. Park staff tend to use the horseshoe and volleyball area or the RV pad area for overflow parking because there are not enough designated staff parking spaces to accommodate one parking spot for each employee. In some cases, visitors attempt to use the staff RV pads when the campground is full and must be redirected to visitor accommodations by park rangers. Designated accessible parking spaces serve the park headquarters and ranger station, but no designated accessible parking spaces serve the staff housing area. The visitor center does not include a vehicle drop off area for passenger vehicles or tour buses, which exacerbates parking shortages during peak visitation times and causes congestion at the north and west entrance to the visitor center. One accessible parking space is located northeast of the visitor center entrance at the far corner of the parking lot, near the two accessible picnic tables.

The Cedar Lodge parking areas provide spaces for visitors arriving by passenger vehicle and an open area that serves tour buses. Each cabin also includes a parking space for visitors. The lodge areas also include parking spaces for staff near the main lodge building and spaces near other support structures serving the lodge operation. No vehicle drop off area or overflow area is available when the lodge parking lot is filled to capacity.

The amphitheater parking area only serves passenger vehicles and does not have spaces to accommodate tour buses or recreational vehicles. No vehicle drop off area or overflow area is available when the existing parking lot is filled to capacity.

Butte Loop and Agate Loop contains pull outs beside each individual campsite, and the Group Loop contains pull outs serving the group campsites. No accessible parking spaces are located in the campground area. Table 12 contains a parking inventory summary.

**TABLE 12: PARKING INVENTORY SUMMARY**

Location	User	Vehicle Type Accommodated	Total Number of Designated Spaces	Number of Designated Accessible Spaces
Visitor Center	Visitor	Passenger vehicles	54	4
		Recreational vehicles	15	2
		Tour buses	5	0
	Staff	Passenger vehicles	32	3
Headquarters /Natural Resources/ Ranger Station	Staff	Passenger vehicles	37	1
Staff Housing	Staff	Passenger vehicles	44	0
		RV pads	9	0
Cedar Pass Lodge	Visitor	Passenger vehicles	65	2
		Tour buses	2	0
	Staff	Passenger vehicles	34	0
Amphitheater	Visitor	Passenger vehicles	55	2
Campground	Visitor	Passenger vehicles/recreational vehicles	100	0
<b>TOTAL SPACES</b>			<b>452</b>	<b>14</b>

## Pedestrian System

A number of pedestrian walkways connect facilities in the Cedar Pass area. At the visitor center / park administration area, sidewalks provide circulation between the visitor center, park headquarters, and ranger station. Two pedestrian crossings cross Ben Reifel Road—one serving a sidewalk leading to the tour bus parking area and a second linking to a trail connecting to Cedar Pass Lodge. Pedestrians use the roadways to walk between the ranger station, park headquarters, and visitor center.

Several other pedestrian connections provide walking connection between facilities. These include (1) a connection between the visitor center sidewalk network to the Cedar Pass Lodge parking lot, (2) a connection between the Cedar Lodge Parking lot to the amphitheater parking lot, (3) a connection between the amphitheater parking lot and both the amphitheater and Campground Loop Road, and (4) a connection between Group Loop and Agate Loop, linking the individual and group campsites. Additionally, an informal trail links the operational support area to the employee housing area. Campground Loop Road serves as a pedestrian route between the amphitheater and individual campsites.

## **Bicycle System**

Bicycles are permitted to use the roadways serving the area and must share the road with vehicles and in some cases pedestrians. Three bicycle racks are located at the visitor center, each capable of storing four bicycles each.

## **VISITOR EXPERIENCE**

Within the project area, several overlapping components contribute to the visitor experience at the park, including the arrival, entry, and departure experience; trail and pedestrian access; the availability of amenities and visitor lodging; and the availability of interpretive and educational opportunities. Activities in the Cedar Pass area include resting, picnicking, sightseeing, viewing exhibits and attending interpretive programs, using the restroom, climbing, hiking, camping, or bicycling on designated roadways. Visitors can also arrange overnight stays at the cabins associated with the Cedar Pass Lodge, explore the Ben Reifel Visitor Center and visitor center store, dine at the Cedar Pass Lodge restaurant, or browse the Cedar Pass Lodge gift shop for souvenirs or convenience items.

## **Visitation Trends**

Visitation to the park has steadily increased at an average of 1.6% annually between 2007 and 2016 (Dornbush Associates 2017). In 2017, there were 1,054,325 visitors in the park (NPS 2017c). The last annual visitation record with more than a million visitors was in 2000 (NPS 2017c). Visitation to the park follows a pronounced seasonal pattern. Visitation during the peak season between June and September accounts for more than 75% of visitors each year, while July and August alone account for almost half of the park's annual visitation (Dornbush Associates 2017). The Ben Reifel Visitor Center averages approximately 2,540 daily visitors during July, and routinely has more than 300 visitors per hour between the hours of 10:00 a.m. and 4:00 p.m. during June, July, and August (NPS, Czazasty, pers. comm. 2018b).

## **Arrival, Entry, and Departure Experience**

As discussed in chapter 2, the visitor experience at Cedar Pass largely reflects the Mission 66-era design approach, which focuses on the flow of visitors based on a standard set of experiences. The entry experience encompasses the visitors' activities from the time they arrive via their transportation mode until they pass through the admission gates at either the northeast or the interior entrance. During this time, visitors prepare themselves for their upcoming experience. Visitors arrive at the Cedar Pass area in privately owned vehicles (including recreational vehicles), tour buses, bicycles, and on foot, but the majority arrive in privately owned vehicles. During peak visitation seasons (typically Memorial Day through Labor Day), the existing parking lot at the visitor center fills to maximum capacity, causing visitors to park in administrative parking areas (NPS 2017d). There is no designated vehicle drop off area at the visitor center, which contributes to congestion during peak visitation season. The existing parking lot configuration at the visitor center makes it challenging for visitors driving recreational vehicles to maneuver and exit the lot. Bus parking is located south of the visitor center and is subject to flooding during rain events. During peak visitation, bus parking also overflows to the staff parking area southeast of visitor center lot. As a result, NPS staff parking areas have become a part of the visitor's arrival and departure experience.

## **Trails and Pedestrian Access**

A number of pedestrian walkways throughout the project area connect various facilities, as described above in the "Transportation" section. There are no designated trails from the visitor center, and there are no formal trails within the immediate project area. Visitors informally climb on nearby geologic

formations east of the visitor center or cross the highway to the north of the visitor center to climb or observe the geologic formations located there. Several informal, unpaved social trails traverse the project area, including a social trail that runs north/south from the NPS housing area to the operational support area.

Multiple formal trails are located outside the project area to the north and provide access and connections to park resources outside the Cedar Pass area. The Cliff Shelf Nature Trail is closest to the project area and provides pedestrian access from shoulder parking. The “Visitor Safety” section provides additional information regarding pedestrian and vehicle conflicts within the Cedar Pass area.

## **Visitor Amenities**

**Visitor Center.** The Ben Reifel Visitor Center, located on Badlands Loop Road, is the primary visitor center in the park. It contains a visitor center store, classroom, theater, information desk, and museum exhibits. The facility also has restrooms that are in moderately good condition. During peak season in the park, the visitor center cannot adequately accommodate visitor use levels. A study conducted at the visitor center identified visitor congestion issues around the front desk (NPS 2017d). In addition, park staff have reported poor ventilation in the building.

**Campground and Amphitheater.** The campground area is located to the west of the visitor center. Both individual and group camping is available to visitors. Ninety-six campsites are dedicated to individual camping within the project area, 22 of which have electricity. The individual campsites are connected by one-way paved loops, the Agate Loop and the Butte Loop, which are car- and RV-accessible from shoulder or pull-through parking. Adjacent to the individual campground area, the Group Loop has four campsites dedicated to group camping. The campground area contains two restrooms, a comfort station, and one shared shower building. During peak season, the campsites are full, and occasionally overflow (NPS 2017d). Additionally, visitors often experience traffic congestion upon exiting the campground area at the intersection of Highway 377.

The 250-seat amphitheater, located near the Group Loop, is used for a variety of interpretive programs operated by the park. An additional 200 to 250 visitors have been observed sitting on nearby buttes. Because of the close proximity to the campsites at the Group Loop, park staff have reported headlight disruptions from nearby cars during evening programs held at the amphitheater.

**Visitor Lodging.** The Cedar Pass Lodge and associated visitor lodging area is located between the Ben Reifel Visitor Center and the campground and is operated by a concessioner. The Cedar Pass Lodge contains a full-service restaurant and a gift shop. During the peak season, the restaurant does not provide adequate space for the influx of visitors (NPS 2017d). In addition, roof leaks within the building have been reported during inclement weather, and on occasion, such leaks have affected kitchen service for visitors.

Twenty-six cabin units, three of which are duplex units, make up the visitor lodging area. The Lodge Cottage is not available to visitors because of its failing condition. During peak season, the cabins are fully booked by visitors; demand for cabins by visitors during this time has been reported to exceed the current availability (NPS 2017d). The rental season for cabins is currently April to October; future concessioner contracts may extend the rental season to additional months. Because of the increase in visitor demand, within the last year, the renting season has been extended, and cabins have remained open until November 1 (NPS 2017d).

**Outdoor Gathering Area and Interpretive Shelter.** The outdoor gathering area, also referred to as the Ben Reifel Picnic Area, is located adjacent to the visitor center to the east. It has four sheltered picnic benches. In addition to picnicking, this area is used as a meeting location for various interpretive

programs. The area does not include any pavilions, shelters, or structures aside from the picnic benches to provide protection from the sun or inclement weather.

To the west of the visitor center, a wooden interpretive shelter is located adjacent to the amphitheater parking lot. The shelter contains one wooden picnic bench. A bike rack is located adjacent to the shelter.

### **Interpretive and Educational Opportunities**

Visitors can experience various interpretive and educational opportunities available at the Cedar Pass area, including viewing brochures and museum exhibits available at the visitor center; taking self-guided walks; attending programs held at the amphitheater or interpretive shelter; and attending a variety of talks, tours, and other programs led by park staff.

While a number of interpretive opportunities are currently available in the project area, the paleontology lab program does not have a permanent space. The paleontology lab program occupies the educational classroom at the visitor center from May through September. As a result, during this period, the intended use of the visitor center's classroom is disrupted (NPS 2017d). During inclement weather, the NPS staff library in the visitor center is used as a classroom because the paleontology lab is occupying the visitor center classroom (NPS 2017d). As such, NPS staff amenities have become a part of the visitor experience.

### **VISITOR SAFETY**

The discussion of visitor safety includes three topics: conflicts between pedestrians and vehicles, conflicts between vehicles, and emergency access and circulation. These conflicts occur when different transportation modes or individual vehicles are competing for the same space within the transportation network or their movements converge in an uncontrolled fashion, creating safety hazards and increasing the potential for accidents.

**Conflicts between Pedestrians and Vehicles.** Conflicts between pedestrians and vehicles occur at numerous points in the Cedar Pass area, including the trail or sidewalk crossings in the visitor center, parking areas that connect the trail network, and roadways where pedestrians must share the road with vehicles. Four designated pedestrian crossings are near the visitor center—one crosses the center of the main visitor parking area, two are located 75 feet apart along Ben Reifel Road directly west of the Ben Reifel Visitor Center building, and a fourth connects the RV parking spaces to the visitor center sidewalk network. These crossings each have zebra style striping to designate the crossing but do not contain any signage to help draw driver's attention to the crossing. In these four locations, pedestrians are subject to vehicle conflicts for a short span of time equating to less than 10 seconds based on a typical pedestrian crossing walking speed of 3.5 feet per second (FHWA 2009).

The lodge and amphitheater parking lots each provide a connection for pedestrians between trail ends to walk from the visitor center area and campground amphitheater. At the Cedar Point Lodge parking area, pedestrians must cross more than 140 feet of an active parking area. The amphitheater lot requires pedestrians to cross more than 260 feet of active parking area. In both cases, pedestrians are subject to vehicles conflicts for over 1 minute of travel time, based on a 3.5 feet per second travel rate.

Pedestrian vehicle conflicts also occur along Campground Loop Road at the trailhead near the intersection with Highway 377. Pedestrians destined to or from the individual campgrounds walk along the road for upwards of a third of a mile to reach the farthest campsite. This walk exposes pedestrians to vehicle conflicts both along the main travel way connecting the campground to Highway 377 as well as the campsite areas along Butte or Agate Loops where vehicles may pull out or park.

**Conflicts between Bicycles and Vehicles.** Conflicts between bicycles and vehicles occur along Highways 240 and 377. These roadways have two travel lanes and small shoulders, and vehicles must carefully maneuver past the bicyclists traveling along these thoroughfares (NPS 2018c).

**Conflicts between Vehicles.** Vehicle conflicts occur in three locations: (1) at the entrance/exit intersections along highway 240 with the visitor center and Cedar Pass Lodge parking areas, (2) along Ben Reifel Road, and (3) through the campground loop roadways. The entrance and exit driveways that connect to Highway 240 contain wide expansive areas of pavement without lane markings that limit a vehicle to a single entrance or exit lane. This is especially prevalent at the Cedar Pass Lodge driveways, where 85-foot wide openings exist. These conditions create safety concerns and conflicts between inbound and outbound visitor vehicles.

Multiple conflicts between vehicles occur along Ben Reifel Road because there are more tour buses than there are tour bus parking spaces (five), which results in congestion. Additionally, the narrow width of Ben Reifel Road and the configuration of travel lanes within the parking lot creates difficulties for recreational vehicles and tour buses to maneuver in and out of parking spaces. These larger vehicles also have trouble passing other vehicles attempting to park or exit the parking lot, which creates congestion and hinders the flow of traffic.

Campground Loop Road width varies in width between 15 feet to 50 feet. Because vehicles of different sizes can be parked along either side of the loop road, the actual clearance may be reduced by as much as 24 feet. This reduction can result in vehicle conflicts and possible side swipe crashes at slow speeds. The Cedar Pass Lodge Loop Road that serves the cabins has a similar clearance issue; although, the travel-way is 24 feet wide; therefore, a 12-foot clearance is still available to pass a parked vehicle. Given that the road serves the cabins, most of the visitors park passenger vehicles rather than recreational vehicles.

**Emergency Access and Circulation.** Emergency vehicle access is a problem primarily along the campground loop roads (Butte and Agate Loops), where recreational vehicles and oversized sport-utility vehicles line both sides of the road, leaving limited space to pass. This narrow travel lane may be a factor if a visitor residing in the individual campground sites requires emergency medical treatment. To a lesser degree the loop road serving the cabins may also be an issue for an ambulance to reach the farthest cabin given vehicles parked on the right taking up travel-way space.

Emergency vehicle access along Ben Reifel Road is a problem in terms of vehicle congestion. If a tour bus, recreational vehicle, and passenger vehicle all enter or exit at the same time, emergency access could be delayed until the three vehicles clear the travel-way.

## CULTURAL RESOURCES

Cultural resources include a variety of resource types such as historic buildings, structures, objects, archeological sites, and ethnographic resources, which can also be grouped in broader districts or landscapes that have significant associations with prehistory or history. The significance of cultural resources is assessed by their eligibility for inclusion on the national register. To be eligible, resources must possess integrity and meet at least one of four criteria. The resource:

- A) is associated with events that have made a significant contribution to the broad patterns of our history; or
- B) is associated with the lives of persons significant in our past; or
- C) embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D) has yielded, or may be likely to yield, information important in prehistory or history.

Integrity is the ability of the resource to convey its significance by retaining several or most of its aspects of location, design, setting, materials, workmanship, feeling, and association. The National Park Service categorizes cultural resources as archeological resources, cultural landscapes, ethnographic resources, historic structures, and museum collections. As noted in chapter 1, archeological resources, ethnographic resources, and museum collections have been dismissed from consideration in this analysis; the remaining resources are described below.

### **CULTURE HISTORY OF CEDAR PASS AREA OF THE BADLANDS**

The earliest human occupation of the White River Badlands dates back to the Paleoindian period (about 12,000–7500 before present [BP]). During this period, groups of people now called Clovis and Folsom practiced highly mobile hunter-scavenger subsistence strategies that relied on large game. The Plains Archaic (7,500–2,250 years BP) and Plains Woodland (2,250–1,100 years BP) periods that followed are poorly represented in the park's archeological record. Characterized by the transition to smaller projectile points made from locally sourced materials and the use of pottery, only a few sites in the park have been definitively identified as dating to those periods (Hannus et al. 2003; Jones 2002). Late Prehistoric and Plains Village tradition (1,000 BP to the contact era) people likely came into the area from the Middle Missouri or Central Plains regions. Sites from this period occur in greater numbers. Artifact and feature types found at these sites include animal bone, lithic material, hearths, and prehistoric ceramics. During and for several centuries prior to contact, Caddoan and Siouan-speaking groups, including ancestors of the Wichita, Kitsai, Pawnee, Arikara, Mandan, and Hidatsa, migrated in to the region. By around 1600, other Siouan-speakers from the Ohio Valley arrived including Otoe, Missourian, Iowa, Omaha, Ponca, Kansa, and Osage. By that time the horse had been introduced in to the Southern Plains Region by the Spanish and its use spread quickly northward (John Milner Associates 2005). The area was acquired by the United States via the Louisiana Purchase in 1803, and the Lewis and Clark expedition the following year became the first European record of the cultural and natural landscapes of the Badlands area. The Indian Removal Act of 1830 and the subsequent smallpox epidemic among Plains Indians decimated Native American populations as eastern tribes were forcibly relocated west of the Mississippi. South Dakota was established as a territory in 1860 and admitted to the union as a state in 1889.

Interest by white Americans in the Badlands area was spurred by the unique geologic formations and paleontological fossils of the area. US government policies, including the Land Ordinance Act, Pre-emption Act, Homestead Act, Timber Culture Act, and Carey and Desert Land Acts, all facilitated the survey, sale, and settlement of the former Native American lands. In 1906 and 1907, considerable homestead activity occurred in the Badlands area, and railroad development entered the region through White River Valley. Increased tourist interest in the Badlands encouraged local leaders such as State Senator Peter Norbeck to begin efforts to set aside portions of the Badlands as a national park. President Coolidge authorized the creation of Badlands National Monument in 1929, which set in motion the processes by which the state could acquire more land and establish roads, and the Department of the Interior granted concessioner franchises for visitor amenities. Only after these efforts would the monument be officially dedicated. During the Great Depression, many of the private landowners left their homesteads in the area, and New Deal programs, including the Federal Emergency Relief Administration, made possible the securing of much of the land for what is now Badlands National Park (John Milner Associates 2005).

The development of visitor concessions at Cedar Pass began early in the efforts to create park at the Badlands. The original proponent of the park's creation, Senator Norbeck, was related by marriage to local concession owner Ben Millard. The two began planning for tourist facilities near Cedar Pass as early as 1927. Millard's sister, Clara, purchased a plot of private land at the foot of Cedar Pass on which Ben constructed a dance hall and original lodge in 1928, with the addition of rental cabins in 1930 (John Milner Associates 2005). At the same time, Millard and Norbeck surveyed and lobbied the state highway commission to develop improved highways through scenic areas to attract tourists to their planned

concessions. By 1935, automobile travel had been improved within the monument with 42 miles of roads (John Milner Associates 2005).

NPS master planning efforts in the 1930s initially considered improvements and the location of administrative facilities at the Pinnacles, though eventually the Cedar Pass area was selected for development and the incorporation of Millard's lodge and cabins were likely aided by his offer to donate 28 acres of land to the park. In 1939, the initial development stipulations being met, Badlands was proclaimed a national monument of 150,000 acres. Early development of the park infrastructure was completely by the Civilian Conservation Corps, which was initially housed in a camp at Quinn Table, but was subsequently relocated to Cedar Pass. Their work focused on water supply, road improvement, visitor signage, and comfort facilities. Development of the Cedar Pass area was largely limited to maintenance and refurbishment during the World War II years, with projects including landscape plantings, expansion of electrical and telephone service, and toilet facilities in the cabins (John Milner Associates 2005).

Like other parks across the nation, visitation rebounded after World War II and expanded greatly in the early 1950s, which placed a great strain on the then aging park accommodations. Mission 66 was a large-scale effort by the National Park Service to upgrade the nation's parks in the period following World War II. Neglected since the New Deal era improvements of the 1930s, national parks across the country were in serious need of long-term funding for large-scale improvement projects (Allaback 2000). Contributing to the growth in the number of visitors after World War II was the post-war economic boom and the ability of more and more Americans to buy personal automobiles, enabling them to visit the nation's treasures. In response, the National Park Service needed new facilities to accommodate the crowds, and it needed those facilities designed in a way that would best protect the parks from resource damage.

National Park Service Director Conrad Wirth first conceptualized the idea of modernizing parks through a massive, multi-year redevelopment program in February 1955. Wirth requested a decade of funding, rather than the traditional year-by-year funding requests. As envisioned by Wirth, "Mission 66 would allow the Park Service to repair and build roads, bridges and trails, hire additional employees, construct new facilities ranging from campsites to administration buildings, improve employee housing, and obtain land for future parks...to elevate the parks to modern standards of comfort and efficiency, as well as an attempt to conserve natural resources" (Allaback 2000). On January 27, 1956, Wirth introduced the Mission 66 concept to President Dwight Eisenhower and his cabinet, where it received immediate approval. The program was officially presented to the American public the following month (Allaback 2000; Carr 2007).

Planning for the implementation of Mission 66 program at Badlands National Monument began in 1956 and focused on expanding the ability of the facility to both accommodate and interact with larger numbers of visitors. To facilitate increased education and interpretation, a new kind of structure, the visitor center, a central legacy of the Mission 66 program throughout the park system, was used to orient and educate visitors on the Badlands' natural and cultural resources. The new building type coincided with the incorporation of modern architectural design in park buildings, notably in the work of Cecil Doty, leading architect at the Western Office of Design and Construction, who designed the Ben Reifel Visitor Center. Modern materials and construction methods with clean horizontal massing both fitting in with and shaping the experience of the natural setting were emphasized in the new "Park Service Modern" style of structures, as opposed to the preceding "Park Service Rustic" style of the 1920s and 1930s that emphasized local natural materials, traditional aesthetics, and individual craftsmanship (Allaback 2000). Cecil Doty incorporated the modern aesthetic and principles in to the visitor center design, which featured simple, clean lines, large picture windows facing the picturesque landform, and a large porch to protect the entrance from climate extremes. The visitor center was completed in 1958, and several additional components of the Cedar Pass area, including park residential structures, signage, fencing, the headquarters area, and campground were also completed as part of the Mission 66 program. Like the visitor center, modernist ideals influenced Mission 66 campground planning, including at Badlands, in the

construction of a narrow one-way road to reduce traffic and maximize vistas, as well as the inclusion of Native American-inspired picnic shelters, and interpretive programming space for recreational vehicles provided in the amphitheater (John Milner Associates 2005).

Additional developments in the 1960s included the NPS's acquisitions of the last of the Millard property, including the Cedar Pass Lodge and cabins, which would be operated on a contract basis. Developments following Mission 66 focused on accommodating ever-increasing visitation, and in particular expanding parking facilities at the visitor center, lodge, and campground. In 1978, the Badlands National Monument was redesignated Badlands National Park, given its range of visitor experiences and services beyond primarily preserving natural resources (John Milner Associates 2005).

Since the redesignation of the Badlands National Park, major changes to the park have included rehabilitations to visitor center and campground, as well as the removal of the original 22 Cedar Pass Lodge cabins in 2011 and their replacement with 23 newly built cabins in 2012 to 2013.

## **CULTURAL LANDSCAPES**

The National Park Service defines cultural landscapes as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural and aesthetic values" (Birnbaum 1994). A cultural landscape report for the Cedar Pass area was completed in 2005 on behalf of the National Park Service (John Milner Associates 2005). One of the primary recommendations of the report is to include the already national register-eligible Badlands Loop Road (referred to as Cedar Pass Road and Cedar Pass to Northwest Entrance Road in the cultural landscape report), and the Ben Reifel Visitor Center in a larger set of landscape elements in the larger Cedar Pass Developed Area as a historic district under national register criteria A and C for its association with early tourism in western parks, New Deal and CCC development, and NPS's Mission 66 initiative between 1928 and 1966.

The Cedar Pass district was less than 50 years old in 2005; however, the cultural landscape report recommends that the district meet criteria consideration G for requirements as a relatively complete and rare example of Mission 66 development in South Dakota with a high degree of integrity. The South Dakota state historic preservation office concurred with the report's recommendations, and the Cedar Pass area cultural landscape is a national register-eligible historic district.

The landscape includes elements from multiple periods of both private and federal efforts to provide visitor services and administer park functions. These begin as early as 1928 with Ben Millard's construction of the dance hall, lodge, and cabins, of which the lodge remains as a principal built element of the early tourism and park development context of the landscape. In a larger sense, the location of the Cedar Pass area and the roads that serve to facilitate visitor access are also aspects of the early efforts of Senator Norbeck and Ben Millard to develop the park. The park's initial efforts at master planning, land acquisition, the layout of infrastructure, and several built elements are associated with the New Deal / CCC development. However, it is the Mission 66 initiative that left the most visible impact on the current cultural landscape of Cedar Pass area, including park planning and the construction of the visitor center, seven single-family residences, three apartments, the campground comfort station, the amphitheater, two maintenance buildings, and interpretive signage (John Milner Associates 2005).

As defined in the cultural landscape report, the Cedar Pass Developed Area Historic District is a cultural landscape composed of a variety of contributing elements, including natural systems, spatial organization, land use, circulation, topographic modifications, vegetation, buildings, structures, small-scale features, views and vistas, and archeological resources (figure 13).

Natural systems elements include the Badlands geological formations, notably the Badlands Wall, set against the open prairie. Native plant and wildlife communities and the east- and west-side washes are contributing natural systems features and remain much as they were during the periods of significance.

One of the few major changes to the natural systems at the Cedar Pass area since the period of significance is the introduction of non-native Siberian elms at the lodge (NPS 2004; John Milner Associates 2005).

Spatial organization of the area is largely defined by the concentration of development in zones organized by function, including the visitor center and park administration, lodge and associated cabins, and the campground. Minor changes and additions to the spatial organization include several maintenance and residential structures surrounding the administrative cluster. These include the addition of the operational support area, water storage tank and pump, garage, sand sheds, and the alignment of the service road from the visitor center to the seasonal apartments (NPS 2004; John Milner Associates 2005).

Land use of the area contains all the contributing elements from the Mission 66 landscape, including visitor accommodations, lodging, interpretation, recreation, park administration, maintenance, utility, and housing; and several of those elements date to the earlier CCC and early tourism periods of significance (NPS 2004; John Milner Associates 2005).

Circulation features of the Cedar Pass area took shape during the early tourism period, and from that period, the major access and touring routes of the Loop Road and Highway 377 remain. While road improvements were a major part of the CCC work at the park, only service road segments remain specifically associated with that context. Major Mission 66-era circulation features remain, including the front visitor center parking lot, campground loops, and numerous trails and sidewalks. Later non-contributing features include several additional service and spur roads, additional parking lots, and sidewalks around the administrative building and lodge (NPS 2004; John Milner Associates 2005).

Given the rough terrain of the Badlands, topographic modifications were necessary throughout the Cedar Pass area, primarily for road and building construction. Modifications for contributing circulation and structure features include contributing topographic modification features as well. Additionally, the former wastewater lagoon was constructed in the 1940s as part of the CCC work and is a contributing feature to that period of significance. New wastewater lagoons, located outside the project area and constructed in 2002 are non-contributing topographic modifications (NPS 2004; John Milner Associates 2005).

Vegetation features from the earlier periods of significance at the Cedar Pass area are not well known. A Mission 66 planting plan from 1956 identifies proposed ornamental vegetation around the residences, visitor center, and campground. Trees dominate those planned plantings, and species include Indian currant coralberry, silver sagebrush, green ash, sand cherry, box elder, American elm, and common hackberry. Those species are still represented around area and appear to derive from the period of significance. The vegetation around the cabin and lodge are not known from the period of significance, and the maintenance area nursery post-dates 1985 (NPS 2004; John Milner Associates 2005).

More than 70 buildings and structures are included in the Cedar Pass area, of which 47 were contributing features to the historic landscape when first described. These features are described in greater detail in the following section and include the Ben Reifel Visitor Center, Cedar Pass Lodge and associated supporting structures, Cedar Pass Lodge Cottage, campground comforts stations, resource protection building, tack room, maintenance and cold storage buildings, and several of the staff residences and seasonal apartments. Critically, since the cultural landscape report was published (NPS 2004; John Milner Associates 2005), 22 of the original Cedar Pass Lodge cabins, which had been considered contributing features to the historic landscape, were removed and replaced with 23 new cabins in 2011–2012. Those new cabins are non-contributing, but compatible, features of the cultural landscape.

Small-scale features are largely from the Mission 66 period at Cedar Pass and include the visitor center sign, flagpole, picnic shelters, and amphitheater benches. Other possible Mission 66 features may include several trashcans, signs, lighting, and other furnishings. Many other small-scale features are replacements or recent additions because many exterior objects became obsolete or fell into disrepair. More recent non-contributing features around the area include informational signs, phone boxes, kiosks, dumpsters,

fire hose and hydrants, lawn chairs, chain link fencing, bollards, vending machines, utility and RV connections, television antennas, and many small exterior features of the residences (NPS 2004; John Milner Associates 2005).

Views and vistas are a key element of the Cedar Pass area landscape and the value of the park as a whole. Views from the top of the pass, visitor center area, lodge area, campground area, and from the Loop Road are all contributing features that have changed little since the Mission 66 era. The landscape and its incorporation into park planning has also served to screen new and potentially intrusive aspects of views within the area (e.g., the maintenance facilities) and has preserved views from the main s visitor experience areas. One of the most impactful changes to the views has resulted from the modification of the originally open front (north) porch, which has been in-filled and views are longer visible while on the porch (NPS 2004; John Milner Associates 2005).

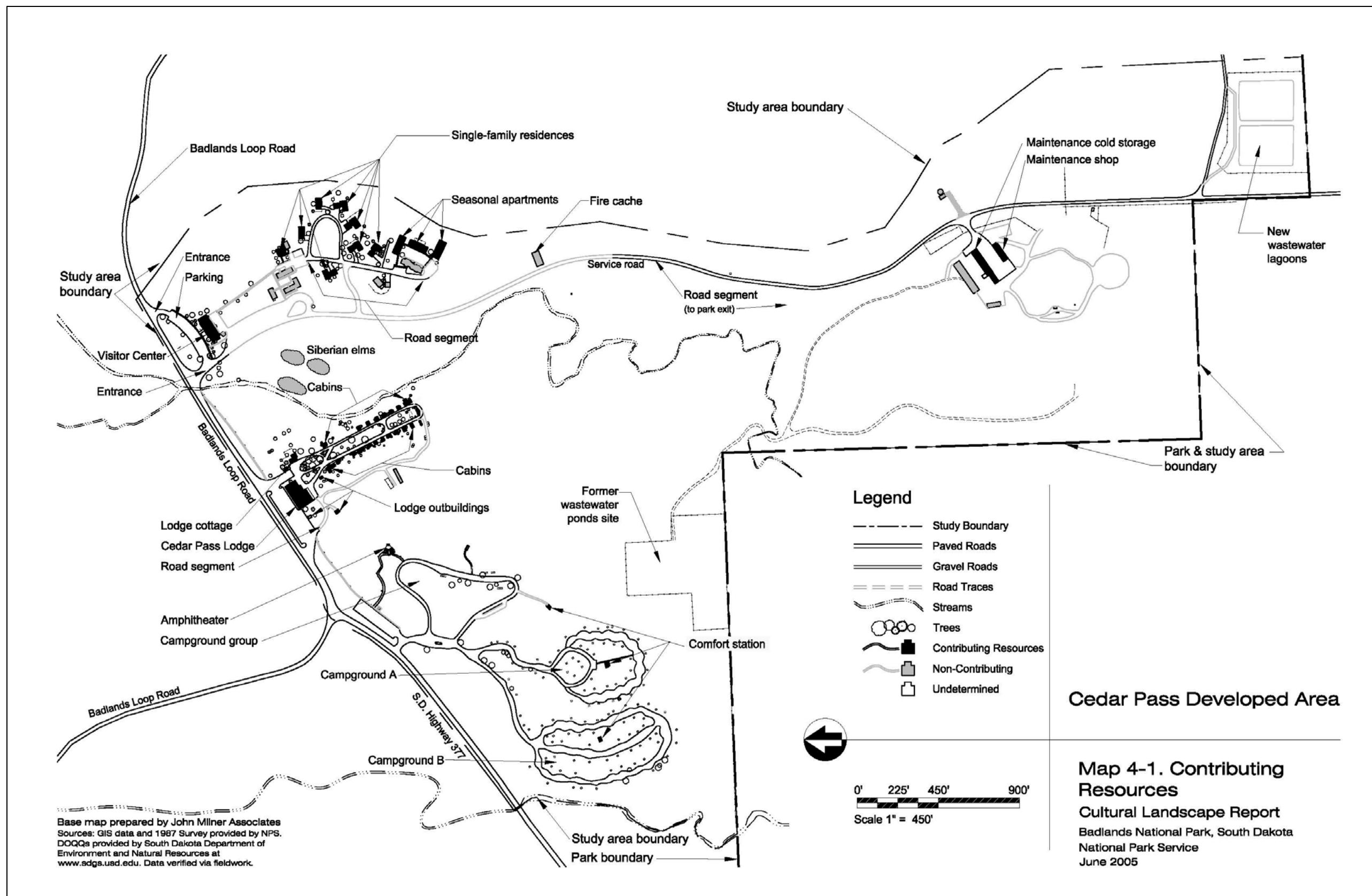


FIGURE 13: CEDAR PASS CULTURAL LANDSCAPE

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## HISTORIC STRUCTURES

As noted above, more than 70 structures have been identified within the Cedar Pass area, among which 47 structures were originally described as contributing features to the national register-eligible Cedar Pass Developed Area Historic District. Only 27 of those structures remain as contributing features to the national register-eligible landscape (table 13). Additionally, the visitor center was individually recommended eligible for the national register in 2003 under criterion A for association with NPS's Mission 66 program. The visitor center features simple, clean lines, large picture windows facing the picturesque landform, and a large porch to protect the entrance from climate extremes. At the time of its eligibility evaluation, the visitor center had not yet reached 50 years of age, but was still recommended eligible under criteria consideration G because of its exceptional importance as the only remaining Mission 66 visitor center in the South Dakota (John Milner Associates 2005).

**TABLE 13: CONTRIBUTING HISTORIC STRUCTURES AT CEDAR PASS DEVELOPED AREA**

Structure Name	Date	Structure No.	LCS ID	Condition/ Assessment Date
Cedar Pass Visitor Center	1959	B-01	326491	Good, 2013
Cedar Pass Lodge	1927-1986	B-02		Fair, 2005
Lodge Cottage	1946	B-03	381074	Fair, 2013
Lodge Laundry Building	1927-42	B-04	381075	Poor, 2013
Lodge Maintenance Building	1927-42	B-05	381079	Poor, 2013
Campground Comfort Station Group 2	1956-63	B-26	381140	Good, 2013
Campground Comfort Station A	1956-63	B-27	381144	Good, 2013
Campground Comfort Station B	1956-63	B-28	381146	Good, 2013
Resource Protection Building	1942	B-32	381149	Fair, 2013
Residence #28	1953	B-34	381151	Good, 2013
Residence #29	1953	B-35	381154	Good, 2013
Residence #30	1952-55	B-36	381155	Good, 2013
Garage #30A	1952-55	B-37	381159	Good, 2013
Residence #31	1958-59	B-38	381161	Good, 2013
Garage #31A	1958-59	B-39	381163	Good, 2013
Residence #32	1959	B-40	381165	Good, 2013
Garage #32A	1959	B-41	381171	Good, 2013
Residence #33	1959	B-42	381174	Good, 2013
Garage #33A	1959	B-43	381176	Good, 2013
Seasonal Apartment #45	1959	B-49	381182	Good, 2013
Seasonal Apartment #51	1959	B-50	381184	Good, 2013
Seasonal Apartment #52	1959	B-51	381187	Good, 2013
Maintenance Shop	1960	B-53	381188	Good, 2013

Structure Name	Date	Structure No.	LCS ID	Condition/ Assessment Date
Maintenance Cold Storage	1961	B-54	381189	Good, 2013
Lodge Ice House	1927-42	S-01	381194	Fair, 2013
Tack Room	1942	S-10	381196	Fair, 2013
Concrete Block Retaining Wall	1956-66	S-16		Good, 2005

While the Cedar Pass Lodge was determined individually not eligible for the national register in 1983, it is considered a contributing feature of the national register-eligible Cedar Pass Developed Area Historic District. Major renovations and expansion of the lodge occurred in 1986–1987. The central portion of the current structure is the original circa 1928 simple gable-roof structure built for concessioners Ben Millard and Clara Jennings. Later additions were built on the north and south sides. The lodge features traditionally simple Western style elements, including stucco walls and deep overhanging eaves with exposed round log rafters. A historic structures report for the lodge is ongoing and is tasked with determining the extent of historic fabric, documenting the building evolution, and capturing the existing condition of ancillary structures.

The original Cedar Pass Lodge cabins were constructed around 1928 to the rear of the lodge to provide overnight visitor accommodations. The cabins were arranged in a U-shape facing a small grassy court. They were small, simply built, wood frame structures, with several updates made throughout the years, including the addition of small bath facilities, stucco exteriors, and masonry accent features. In 2012, the current concessioner moved or demolished the 22 original cabins, which were contributing features of the Cedar Pass Developed Area Historic District. These cabins were replaced with 23 modern modular structures that were selected to be compatible with the landscape in massing, color, and arrangement; though the new structures are not contributing features to the landscape nor eligible in their own right.

A few structures pre-date the Mission 66 landscape, including the resource protection building and tack room. The resource protection building is the former CCC ranger station and the only extant structure that is directly associated with former CCC activities. The building is traditional Western in style with light-colored stucco exterior; more recent additions and modifications to the structure include roofing, gutters, and windows. The tack room is of uncertain date and association but appears to predate the Mission 66 landscape and could be from the CCC period. It is small, one-story, wood frame structure in relatively poor condition.

Many other historic structures are contributing features of the national register-eligible historic district because they were designed and constructed as part of the Mission 66 landscape. These include several maintenance structures and three of campground comfort stations, which are concrete masonry structures that the cultural landscape report refers to as “Usonian” design, indicating their American modernist style. Six staff residences (numbers 28 through 33) were also constructed as part of the Mission 66 program and are single-family, one-story structures with low sloped roofs. Three have attached garages and three have detached garages that are also contributing features to the cultural landscape. Residences 28 and 29 are clad in painted, wide-cedar siding, whereas the remainder are clad in lightly textured stucco. Recent changes to the exterior of the structures are limited to new roofing materials and replacement windows. Three apartment structures for housing seasonal employees also date to the Mission 66 era and include similar materials and stylistic elements such as lightly textured stucco cladding, low-pitched roofs, and traditional light color palettes.

## PALEONTOLOGICAL RESOURCES

The White River Badlands contain some of the richest paleontological resources in the world (e.g., Benton et al. 2015; NPS 2008a). These resources and their preservation are closely linked to the geology of the park. The four largest geological formations encountered in the Badlands (from oldest to youngest) consist of the Pierre Shale, deposited during the Cretaceous period (75 to 69 million years ago); the White River Group, consisting of the Chadron and Brule Formations, deposited during the Tertiary period between 37 and 30 million years ago; and the Sharps Formation (Arikaree Group), deposited between 30 and 28 million years ago. These formations, and the abundant fossils they preserve, record a history of gradually changing depositional environments and tectonic uplifts, as well as catastrophic events such as volcanic eruptions at the end of the Cretaceous period, 65 million years ago. The Pierre Shale contain remains of extinct species of marine organisms such as ammonites, large marine clams, mosasaurs, and giant sea turtles (Benton et al. 2015), while the dominant wildlife found in the paleontological record of the White River Group are mammals such as a deer-like creature (*Leptomeryx*), giant pigs (*Archaeotherium*), small horses (*Meshippus*), saber-tooth cats (*Hoplophoneus*), rhinoceros/hippopotamus-like creatures (*Subhyracodon* and *Metamynodon*), squirrel-like creatures (*Ischomys*), burrowing sheep-like animals (*Oreodont*), and rabbits (*Paleolagus*) (Stoffer 2003). Other animals include fish, turtles and other reptiles, and birds. Fault lines are located approximately 1 mile to the north of the project area (NPS 2008b); these faults have not been active in the last several thousand years (NPS, Benton, pers. comm. 2018d). Most of the modern landslide movement near the project area is gravity driven and follows deep-seated normal faults and lineaments.

### PALEONTOLOGICAL RESOURCES IN THE PROJECT AREA

The geology in the project area consists of two geologic units (NPS 2008b). Rock outcrops in the project area all date from the Brule Formation deposited during the Tertiary period. The more flat-lying area between the outcrops and buttes of the Brule Formation consists of Quaternary alluvium. These two geologic units and their paleontological resources are discussed below.

#### Brule Formation

**Depositional Environments.** The Brule Formation consists of stream and floodplain deposits from the Oligocene, approximately 34 to 30 million years ago (Benton et al. 2015). Overall, the trend during the deposition of this formation was from subtropical climate conditions toward cooler, more arid climate conditions, although there were also cycles of warm, wet periods with widespread flooding (Harris et al. 2004).

The Brule Formation is subdivided into two members, the older Scenic Member and the younger Poleslide Member. Both members are subdivided further into upper, middle, and lower sequences.

- *Scenic Member:* The Scenic Member consists of alternating rusty-red and graying-white sedimentary layers that represent a series of ancient soil profiles (paleosols) that formed on a broad, gradually shoaling (aggrading) floodplain (Evanoff et al. 2010; Stoffer 2003). The white layers represent stream channel sand deposits, while the rusty-red layers represent paleosols that developed slowly on broad floodplain surfaces. Deposits extend over large distances, suggesting low relief in the region that allowed ancient stream channels to gradually migrate back and forth across a broad savannah-like floodplain.
- *Poleslide Member:* The Poleslide Member is dominated by light-gray massive cliff-forming sandstone and fewer red layers. These deposits reflect a change to larger stream channels that developed as conditions became increasingly drier. Deposition occurred more commonly during episodic flood events as streams dried up intermittently. Watering holes became more important

sites for survival of species adapted to open plain environments over forests. The sandstone layers contain increasing amounts of siltstone sheets, reflecting progressively higher fluvial deposits; bone accumulations are rare in the sandstones layers and occur only in coarse sandstone ribbons (Benton et al. 2015).

Both the Scenic and Poleslide Members are found at the project area. The shorter buttes and outcrops in the project area are part of the middle and upper Scenic Member. The Poleslide Member is exposed in the taller buttes just to the east of the visitor center and in the tall buttes to the north of Badlands Loop Road.

Other formations, found elsewhere in the park, are not exposed in the project area. The older Chadron Formation lies approximately 120 feet below the surface, based on the stratigraphic cross-section in Benton et al. (2015).

Rocks of the White River Group, including the Brule Formation, contain abundant sediment of volcanic origin. These sediments originated from the eruptive centers located in Nevada and Utah and were transported to the Badlands area by wind or rivers (Evanoff et al. 2010). These rocks are rich in swelling smectite clays that are derived from weathering of the small volcanic particles.

**Paleontology.** The Scenic and Poleslide Members have been distinguished by their fauna. The Scenic Member is characterized by abundant oreodonts (*Merycoidodon*), tortoises (*Stylomys*), and horses (*Mesohippus*) (Evanoff et al. 2010). Oreodonts are often compared to sheep in size and shape. Channel sand deposits in the upper Scenic Member were originally called the “*Metamynodon beds*” named after bone beds containing an aquatic variety of rhinoceros.

While the taxa found in the Scenic Member also occur in the Poleslide Member, the younger member is dominated by the oreodont *Leptauchenia* and the horned artiodactyl *Protoceras*. The herbivore *Protoceras* is a sheep-sized member of an extinct group related to camels and deer.

Paleontological resources associated with the Brule Formation vary as a function of their specific depositional environment within a geologic sequence. Aside from these larger defining taxa, the Brule Formation contains a wide range of other fossils. One example of the likely abundance of fossils in the project area is the Saber Site that was opened for a single season in 2012 (Benton et al. 2014). The Saber Site was a visitor-centered fossil quarry, located just to the east of the visitor center on a low badlands knob. The site was named after a seven-year old girl’s discovery of a saber-tooth-cat skull (*Hoplophoneus*). The site was located in a tan mudstone bed within the Scenic Member. Aside from the skull, the Saber Site also produced specimens of an ischyromid rodent, the oreodont *Merycoidodon*, the mouse *Eumys*, the small marsupial *Herpetotherium*, the rabbit *Palaeolagus*, the horse *Mesohippus*, the small deer *Leptomeryx*, a rhinoceros, a lizard, turtle, land snails, and hackberry seeds (*Celtis*). The deposit was within a paleosol and contained other abundant trace fossils reflective of the depositional environment. These fossils included root casts, dung-beetle balls, carnivore coprolites (excrement), as well as a large number of vertebrate microfossils and fragments and isolated elements of larger vertebrates. However, the site only included few large, complete fossils.

## Alluvium

Surface deposits of most of the project area consist of Quaternary alluvium (NPS 2008b). Most of the alluvium likely originated from the surrounding Brule Formation that was eroded and continues to erode, from water, wind, and frost. Erosion rates in the Badlands are fairly rapid. As a result, the alluvium in the project area south of Badlands Loop Road is generally only 2 to 3 feet thick; north of Badlands Loop Road, the alluvium is generally only up to 1 or 2 feet thick (NPS, Benton, pers. comm. 2018d). Fossils are not very common in the alluvium because the erosion cycle is fast. Found occasionally instead are cultural resources such as accumulations of bison skeletons or buried fire pits from the last 2,000 years.

## **PALEONTOLOGICAL RESOURCE MANAGEMENT**

The rich accumulations of terrestrial vertebrate fossils in the Badlands have resulted in major paleontological research over the mid-19th century. The designation of the Badlands National Monument in 1939 was done, in part, because of its fossil resources. The size, abundance of fossils, and multiple jurisdictions of the lands of the now Badlands National Park result in a number of complex issues related to paleontological resource management. Paleontological research in the Badlands started in the mid-19th century and has continued to the present. The National Park Service has developed partnerships with other federal agencies, tribes, and academic institutions to assist with its paleontological resource management. Paleontological resource management policies are specified in the *Badlands National Park, North Unit Final General Management Plan and Environmental Impact Statement* (NPS 2006a).

On March 30, 2009, President Obama signed the Paleontological Resource Preservation Act into law. The act serves as the primary authority for the management, protection, and interpretation of paleontological resources on federal land. It further authorizes penalties for illegal collecting, damaging, otherwise altering or defacing, or for selling paleontological resources.

The National Park Service maintains a geographic information system (GIS) database for the park that contains fossil occurrences of various inventory surveys. These inventories are important for planning road, trail, and other construction projects, especially projects that will expand visitor accessibility into new areas. Currently, the paleontological locality database includes more than 300 documented localities in the park (Benton et al. 2015). These localities are defined areas with multiple fossil specimens, rather than individual occurrences of fossils. The Saber Site is the only paleontological locality within the project area. However, sites are only identified based on observed fossils on the surface and not buried fossils in the bedrock; bedrock (i.e., the Scenic Member of the Brule Formation) in the project area is considered fossil-rich (NPS, Benton, pers. comm. 2018d).

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## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This “Environmental Consequences” chapter analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered in this development concept plan / environmental assessment, in accordance with the National Environmental Policy Act and CEQ’s implementing regulations. This chapter also includes methods used to analyze impacts and the analysis methods used for determining cumulative impacts. The resource topics presented in this chapter and the organization of the topics correspond to the resource discussions in “Chapter 3: Affected Environment.”

### GENERAL METHODOLOGY FOR ESTABLISHING IMPACTS

In accordance with CEQ regulations and Director’s Order 12, direct, indirect, and cumulative impacts are described (40 CFR 1502.16), and the impacts are assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts.

### GEOGRAPHIC AREA EVALUATED FOR IMPACTS (AREA OF ANALYSIS)

The geographic study area for this assessment the Cedar Pass area, unless otherwise stated.

### TYPE OF IMPACT

The potential impacts of the alternatives are described in terms of type, as follows:

- **Direct:** Impacts that would occur as a result of the proposed action at the same time and place of implementation (40 CFR 1508.8).
- **Indirect:** Impacts that would occur as a result of the proposed action but later in time or farther in distance from the action (40 CFR 1508.8).
- **Beneficial:** A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
- **Adverse:** A change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.

### ASSESSING IMPACTS USING COUNCIL ON ENVIRONMENTAL QUALITY CRITERIA

The impacts of the alternatives are assessed using the CEQ definition of “significantly” (1508.27), which requires consideration of both context and intensity:

**(a) Context**—This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

**(b) Intensity**—This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

## CUMULATIVE IMPACTS ANALYSIS METHOD

To assess cumulative impacts, it is necessary to identify other past, ongoing, or reasonably foreseeable future actions at and around the Cedar Pass area that would affect the resources evaluated in this development concept plan / environmental assessment. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts are determined for each impact topic by combining the impacts of the alternative being analyzed and other past, present, and reasonably foreseeable actions that also would result in beneficial or adverse impacts. Because some of these actions are in the early planning stages, the evaluation of the cumulative impact is based on a general description of the projects.

### Past Actions

**Loop Road Cedar Pass Roadway Rehabilitation (2000).** This project consisted of stabilizing the deteriorating Loop Road section that crosses over the active Cedar Pass Landslide area. An environmental assessment was completed that evaluated project alternatives, including the preferred alternative, involving the construction of a stability buttress.

### Present Actions and Reasonably Foreseeable Future Actions

**North Unit Bison Resource Stewardship Plan / Environmental Assessment (2016).** This plan / environmental assessment evaluated alternatives, including the preferred alternative, to expand the current geographic bison range within the north unit of the park to conserve the herd’s genetic integrity, while enhancing the mixed-grass prairie ecosystem and increasing visitor opportunities to view the bison herd.

**Loop Road and Conata Road Engineering Study.** An engineering study is currently being conducted that evaluates conditions along the entirety of Loop Road and Conata Road within the park to develop a 5- to 15-year roadwork plan. This engineering study could result in the future development of a programmatic NEPA compliance document evaluating the proposed repair work.

## STORMWATER AND FLOODPLAINS

### METHODOLOGY AND ASSUMPTIONS

The analysis of potential direct impacts on stormwater and floodplain resources encompasses the Cedar Pass area; indirect impacts on downstream areas outside the Cedar Pass area are also considered. Impacts would result from changes to the amount of impervious surface within the Cedar Pass area, associated alterations to stormwater infiltration and runoff, and disturbance of floodplain functions and values. The analysis also assesses the risk of flood loss and impacts on human, health, safety, and welfare. The analysis is based on a review of existing literature, data and maps for floodplain resources and stormwater drainage conditions, and professional judgement.

### ALTERNATIVE 1: NO ACTION

#### Analysis

Under the no-action alternative, there would be no new impacts on stormwater and floodplains. Stormwater runoff, flooding, erosion, and sedimentation of drainage areas and building foundations would continue to pose operational issues for the park. Current management policies would remain in

effect, and the development footprint would remain unchanged. Sheet flow through the Cedar Pass area would continue to erode soils and carry sediment shed from the surrounding buttes. Channel incision on portions of the intermittent streams caused by high runoff volumes following precipitation events would exacerbate sedimentation concerns and have downstream impacts. Natural processes such as meandering and bank erosion would continue to modify adjacent floodplain functions and values in unstabilized areas; however, no notable disruption of surface waters flows into the floodplains at Cedar Pass would occur. Erosion and sediment accretion would continue to pose operational challenges and could threaten the viability of facilities and infrastructure adjacent to flood zones, including portions of Badlands Loop Road, the campground, and the Cedar Pass Lodge visitor cabins. Therefore, the no-action alternative would result in direct and indirect, long-term, adverse impacts on stormwater and floodplain resources because of continued erosion, sediment accretion, and changes to floodplain functions and values.

## **Cumulative Impacts**

The Badlands Loop Road rehabilitation affected stormwater and floodplain resource functions and values in Cedar Pass by widening the roadway in some areas, which increased impervious surface and associated stormwater runoff, resulting in long-term, adverse impacts. However, the rehabilitation also installed, repaired, and cleaned culverts resulting in overall long-term, beneficial impacts from the drainage improvements and resultant decrease in sedimentation of park infrastructure. Present and reasonably foreseeable actions to conduct a loop road engineering study could lead to increased impervious surfaces and transportation-related infrastructure within flood-prone areas and further increase stormwater runoff. The study would also likely recommend continued improvements to stormwater drainage, resulting in long-term, beneficial impacts. The addition of bison to the north unit within the Cedar Pass area, would not affect stormwater or floodplains. Alternative 1 would contribute appreciable adverse impacts on the overall cumulative effects to stormwater and floodplains. The impacts from alternative 1, when considered together with other past, present, and reasonably foreseeable actions would result in direct, long-term, adverse impacts as a result of continuing erosion and sedimentation and flooding.

## **Conclusion**

Under the no-action alternative, there would be no new impacts on stormwater and floodplains. Stormwater runoff, flooding, erosion, and sedimentation of drainage areas and floodplains would continue to pose operational issues for the park and have direct and indirect, long-term, adverse impacts. Alternative 1 would contribute appreciable adverse impacts on the overall cumulative effects to stormwater and floodplains.

## **ALTERNATIVE 2: PRESERVE AND RESTORE MISSION 66 AT CEDAR PASS**

### **Analysis**

Under alternative 2, there would be minimal expansion of facilities and infrastructure outside the existing development footprint. The development footprint would primarily be expanded in the following locations: along two new campground loops, the amphitheater, the new lodge check-in building and associated parking, the laundry building, seven new visitor cabin units associated with Cedar Pass Lodge, expanded RV and bus parking along the west side of Ben Reifel Road, the new NPS RV pads, and the new interpretive trail north of Badlands Loop Road. The proposed development under alternative 2 would increase impervious surfaces by approximately 1.5 acres, which would increase stormwater runoff, contribute to erosion and sedimentation concerns, reduce opportunities for infiltration and groundwater recharge, and increase flooding and flood risks, resulting in long-term, direct, adverse impacts on stormwater and floodplains. These adverse impacts would be avoided, minimized, and mitigated through the measures outlined in chapter 2.

Under alternative 2, the changes to park staff housing would include the construction of six new structures and the addition of multiuse trails linking the housing area with the visitor center and headquarters areas. This development would increase the amount of impervious surfaces in this area, resulting in increased stormwater runoff, potential erosion and sedimentation concerns, and reduced opportunities for infiltration and groundwater recharge. The NPS staff RV pads would be located south of the operational support area. Although the new concrete RV pads would be elevated with fill to reduce the risk of flooding, the additional impervious surface would increase the volume of runoff and the potential for downstream flooding resulting in direct, long-term, adverse impacts.

All new multiuse trails would be constructed of impervious surfaces. A new interpretive trail would be constructed north of Badlands Loop Road and Ben Reifel Road; Badlands Loop Road would be expanded an additional 5 feet to accommodate a bicycle lane. The expanded trails and roadways would increase impervious surface and therefore result in direct, long-term, adverse impacts from increased stormwater runoff and the potential for erosion, sedimentation, and flooding.

The existing campground would be expanded to add 36 campsites along 2 new loop roads south of the existing campground. Expanding the campground would increase the amount of impervious surfaces and associated runoff. While the northwestern portions of the campground would continue to be located within soils that frequently flood and the 2014 flood zone, some campsites would be relocated outside the flood zone, reducing the risk of flooding for the actively used portions of the campground. Best management practices to control stormwater, erosion, and sedimentation would be implemented to minimize adverse impacts. Expansion of the campground would result in direct, long-term, adverse impacts from potential sedimentation and stormwater runoff but would reduce direct flooding of campsites, resulting in indirect, long-term, beneficial impacts on floodplains.

The amphitheater would be reoriented and expanded to include 100 additional seats and a drop-off area, and the interpretive shelter would be expanded to provide a larger picnic and outdoor classroom area. The expansions would slightly increase the amount of impervious surface and associated stormwater runoff, which would result in direct, long-term, adverse impacts. However, the reorientation of the amphitheater would provide opportunities to improve stormwater flows and better manage the erosion of sediments from the surrounding buttes, resulting in direct, long-term, and beneficial impacts.

The Ben Reifel Visitor Center would be renovated and expanded, and the parking lots would be reconfigured, adding some impervious surface. The changes to the configuration of the parking area between the visitor center and the proposed headquarters building would include a stormwater swale through the visitor and staff parking area and three culverts to channel water into the drainage channel and natural floodplain areas located on the west side of Ben Reifel Road. The changes stormwater infrastructure would improve stormwater management and reduce flood risk, which would have direct, long-term, beneficial impacts. Maintenance of the culverts would be necessary to prevent clogging and address downstream flooding concerns.

The development footprint at the Cedar Pass Lodge would be expanded by constructing a new lodge check-in building and associated parking area in pervious open space. This construction and the construction of a new cabin court to accommodate seven new visitor cabins would increase the impervious surface in this development cluster, resulting in direct and indirect, long-term, adverse impacts from the corresponding increases in stormwater runoff and reduction in opportunities for groundwater infiltration. However, the drainage channel east of the lodge would be repaired to alleviate flooding into the cabin court, resulting in direct, long-term, beneficial impacts on stormwater and floodplains because drainage patterns would be improved to prevent erosion and sedimentation and reduce the likelihood of flooding within the development footprint.

A new building for headquarters and other administrative functions would be constructed in the same general location as the existing structures. The addition of the new building and the expansion of the parking lot between the Ben Reifel Visitor Center and the new headquarters building would increase the

amount of impervious surface and associated stormwater runoff increasing the potential for sedimentation and flooding resulting in indirect, long-term, adverse impacts.

Construction associated with all elements of alternative 2, including the renovation and expansion of the visitor center, construction of a new headquarters building, renovation of the Cedar Pass Lodge and construction of new visitor cabins, construction of new park staff housing, improvements at the campground and amphitheater, and construction of new multiuse trails and improved pedestrian access would require clearing, grading, and soil disturbance. These activities would expose soils, alter drainage patterns, and increase the potential for erosion and sedimentation of surrounding drainage channels. Impacts during construction would be minimized by implementation of best management practices; however, construction activities would still result in direct, short-term, adverse impacts from potential sedimentation and alteration of stormwater runoff.

### **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternative 1. The impacts from alternative 2, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, adverse and beneficial impacts. Alternative 2 would contribute appreciable adverse and localized beneficial impacts on the overall cumulative effects on stormwater and floodplain resources.

### **Conclusion**

**Stormwater.** Under alternative 2, there would be adverse impacts on stormwater resulting from an approximately 1.5-acre increase in impervious surfaces within the Cedar Pass area, which would increase stormwater runoff, contribute to erosion and sedimentation concerns, and reduce infiltration. Additionally, expanding the RV/bus parking area would require stormwater to be channeled through a culvert, reducing infiltration opportunities and likely increasing sedimentation within the stormwater infrastructure.

Impacts resulting from the creation of a small stormwater swale in the visitor center parking area, which would improve stormwater drainage and increase the ability to absorb stormwater on-site would be beneficial. Additionally, the drainage channel east of the Cedar Pass Lodge would be repaired to alleviate flooding into the cabin court. The reorientation of the amphitheater would have direct, long-term, and beneficial impacts by improving stormwater flow and reducing the amount of sedimentation from the adjacent buttes.

**Floodplains.** Under alternative 2, there would be long-term, adverse impacts on floodplains resulting from construction of a new Cedar Pass Lodge laundry building and expansion of the visitor center bus/RV parking lot within the flood zones in the Cedar Pass area. This development would reduce the ability of the floodplain to store and infiltrate floodwaters, filter out sediments, and exacerbate flooding concerns at downstream locations. Additionally, the increase in impervious surface within the Cedar Pass area and alteration of stormwater runoff could indirectly lead to increased flooding.

The installation of a stormwater swale through the visitor center parking would improve stormwater management, reduce localized flood risks, and reconnect drainage to the flood zone on the west side of Ben Reifel Road, resulting in long-term, beneficial impacts. There would be long-term, beneficial impacts from flood risk reduction from the relocation of tent sites currently within the floodplain.

Alternative 2 would contribute appreciable adverse and localized beneficial impacts on the overall cumulative effects on stormwater and floodplain resources.

### **ALTERNATIVE 3: MINIMIZE BUILDING FOOTPRINT**

#### **Analysis**

Under alternative 3, some of the expanded and upgraded facilities would be located within the existing development footprint. The development footprint would primarily be expanded in the following locations: along the expanded campground loops, the amphitheater, portions of the new consolidated visitor center and headquarters building, the new laundry building and eight new visitor cabin units associated with Cedar Pass Lodge, the new administrative building in the operational support area, the new NPS RV pads, and the new interpretive trail to the north of the Badlands Loop Road. The proposed development under alternative 3 would increase impervious surfaces by approximately 4 acres, which would increase stormwater runoff, contribute to erosion and sedimentation concerns, reduce opportunities for infiltration and groundwater recharge, and increase flooding and flood risks, resulting in long-term, direct, adverse impacts on stormwater and floodplains. Avoidance, minimization, and mitigation measures are described in chapter 2.

Under alternative 3, short-term impacts during construction of all proposed development and long-term impacts resulting from the development of park staff housing and new multiuse trails, including a new interpretive trail north of Badlands Loop Road, would be the same as described for alternative 2.

The existing campground would be expanded to add 14 campsites by extending the loop roads south of the existing campground. Expanding campground would increase the amount of impervious surfaces and associated runoff. Campsites in the northwestern portions of the campground would be relocated, and best management practices would be implemented as described for alternative 2. The campground expansion would result in direct, long-term, adverse impacts from potential sedimentation and stormwater runoff, but it would reduce direct flooding of campsites, resulting in indirect, long-term beneficial impacts on floodplains.

Similar to alternative 2, the amphitheater under alternative 3 would be reoriented and expanded to include 100 additional seats and a drop-off area, and the interpretive shelter would be expanded to provide a larger picnic and outdoor classroom area. The amphitheater parking lot would also be reoriented and expanded compared to the no-action alternative. The expansions would increase the amount of impervious surface and associated stormwater runoff, which would increase the potential for sedimentation and flooding, resulting in indirect, long-term, adverse impacts. Reorienting the amphitheater would reduce the amount of sedimentation from the adjacent buttes and provide opportunities to improve stormwater flows, resulting in direct, long-term, and beneficial impacts.

The proposed development within the Cedar Pass Lodge development cluster would result in the same beneficial and adverse impacts described under alternative 2; the magnitude of adverse impacts from the construction of a new cabin court would be slightly larger due to the proposed construction of one additional visitor-lodging unit compared to alternative 2.

The consolidation of the visitor center and a portion of the administrative program in a new approximately 25,000 SF building would increase the amount of impervious surface in this development cluster, resulting in adverse impacts from an increase in stormwater runoff and reduced opportunities for infiltration and ground water recharge. However, the area south of the consolidated visitor center and headquarters building, which serves as a conduit for stormwater flowing from the buttes to the east into the drainage channel on the west side of Ben Reifel Road, would see a reduction in the amount of impervious surface and restoration of vegetated areas. Additionally, a large stormwater swale would be constructed through the visitor and staff parking area, and up to three culverts would channel water into the drainage channel located on the west side of Ben Reifel Road. The added swale and landscape restoration would improve stormwater management and reduce flood risk, which would result in direct, long-term, beneficial impacts. Maintenance of the culverts would be necessary to prevent clogging and

exacerbation of flooding issues. The addition of a new 5,500 SF administrative building in the operational support area would result in localized long-term, adverse impacts from the addition of impervious surface and the corresponding increases in stormwater runoff and reduction in opportunities for infiltration and ground water recharge.

### **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternative 1. The impacts from alternative 3, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, adverse and beneficial impacts. Alternative 3 would contribute appreciable adverse and localized beneficial impacts on the overall cumulative effects on stormwater and floodplain resources.

### **Conclusion**

**Stormwater.** Under alternative 3, there would be indirect, long-term, adverse impacts on stormwater from an approximately 4-acre increase in impervious surfaces within the Cedar Pass area, which would alter stormwater runoff and contribute to erosion and sedimentation concerns.

There would be direct, long-term, beneficial impacts from the restoration of natural drainage patterns and pervious landscaping south of the proposed new visitor center/headquarters building.

**Floodplains.** Under alternative 3, there would be long-term, adverse impacts on floodplains from expansion of the visitor center bus/RV parking lot within the flood zones in the Cedar Pass area. This development would reduce the ability of the floodplain to store and infiltrate floodwaters, filter out sediments, and exacerbate localized flooding. Additionally, the increase in impervious surface within the Cedar Pass area and alteration of stormwater runoff could indirectly lead to increased flooding.

The installation of a stormwater swale and landscape restoration in the parking area would improve stormwater drainage, reduce localized flood risks, and reconnect drainage to the flood zone on the west side of Ben Reifel Road, resulting in long-term, beneficial impacts. Relocating the tent sites currently within the floodplain would reduce flood risks and have long-term, beneficial impacts. In addition, the drainage channel east of the lodge would be repaired to alleviate flooding into the cabin court, resulting in direct, long-term, beneficial impacts on stormwater and floodplains because drainage patterns would be improved to prevent erosion and sedimentation and reduce the likelihood of flooding within the development footprint.

Alternative 3 would contribute appreciable adverse and localized beneficial impacts on the overall cumulative effects on stormwater and floodplain resources.

## **ALTERNATIVE 4: REDEFINE THE EXPERIENCE AT CEDAR PASS**

### **Analysis**

Under alternative 4, some of the expanded and upgraded facilities would be located within the existing development footprint. The development footprint would be expanded in the following locations: along two new campground loops and at the proposed dump station adjacent to the campground entry, the amphitheater, the new lodge check-in building, the new laundry building and 15 new visitor cabin units associated with Cedar Pass Lodge, the new visitor center, the new administrative building in the operational support area, the new NPS RV pads, six new staff housing facilities, and the new interpretive trail to the north of the Badlands Loop Road. The proposed development under alternative 4 would increase impervious surfaces by approximately 5 acres, which would increase stormwater runoff, contribute to erosion and sedimentation concerns, reduce opportunities for infiltration and ground water

recharge, and increase flooding and flood risks, resulting in long-term, direct, adverse impacts on stormwater and floodplains. Avoidance, minimization, and mitigation measures are described in chapter 2.

Under alternative 4, short-term impacts during construction and long-term impacts from the proposed development in the campground and amphitheater development cluster and new multiuse trails, including a new interpretive trail north of Badlands Loop Road would be the same as those described for alternative 2. Similarly, impacts on stormwater and floodplains at the employee housing development cluster would be the same as those described under alternative 2. The RV pads would not be moved south of the operational support area as described for alternatives 2 and 3; instead, they would be relocated just south of their existing location within the housing cluster, in an area that is currently pervious open space. This would result in additional long-term, adverse impacts in the employee housing development cluster. Impacts resulting from the construction of a new administrative building in the operational support area would be the same as those described for alternative 3.

The proposed development within the Cedar Pass Lodge development cluster would result in the same beneficial and adverse impacts described for alternative 2; however, the magnitude of adverse impacts from the construction of a new cabin court would be larger because of the proposed construction of eight additional visitor lodging unit compared to alternative 2, and seven new units compared to alternative 3.

Under alternative 4, the visitor center would be relocated to a new approximately 15,000-SF building on the south side of Badlands Loop Road between the Cedar Pass Lodge and the existing Ben Reifel Visitor Center. The area proposed for the new visitor center is an undeveloped area adjacent to the main drainage channel composed of grasses with some shrubs and trees. The construction of the new visitor center, parking lots, pedestrian sidewalks, and multiuse trails would increase impervious surface in this new development cluster by 1.7 acres. Approximately 0.4 acre of land proposed for the parking lot and multiuse trails associated with the new visitor center is within the known flood zone and is at risk for potential flooding. The added impervious surface within the floodplain and adjacent to the main drainage channel in Cedar Pass would result in an increase in stormwater runoff and the potential for erosion, sedimentation, and downstream flooding in both the Cedar Pass area and downstream areas, resulting in direct and indirect, long-term, adverse impacts. Additional drainage and hydrologic studies would be performed during the design of the facility to identify appropriate flood control and stormwater management strategies that would convey water away from the new facility while avoiding erosion and sediment accretion in the drainage channel, and reducing flood risks to downstream park assets such as the Cedar Pass Lodge cabins.

The Ben Reifel Visitor Center would be renovated to accommodate a portion of the administrative program. The widening of the existing parking area would slightly increase the amount of impervious surface and associated stormwater runoff; however, the existing parking lot and administrative buildings on the south side of the building would be demolished, and this area would be converted to pervious open space. The conversion would mostly restore the natural surface water flow of the area, allow for infiltration and retention of stormwater runoff from the adjacent buttes, and reduce floodwater volume and velocity into the drainage basin west of the visitor center. These improvements would result in direct and indirect, long-term, beneficial impacts. The ranger station and natural resources team would be accommodated in a new approximately 5,500-SF building in the operational support area, resulting in the same impacts described under alternative 3.

## **Cumulative Impacts**

The contribution of other past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternative 1. The impacts from alternative 4, when considered together with other past, present, and reasonably foreseeable actions would result in direct and

indirect, long-term, adverse and beneficial impacts. Alternative 4 would contribute appreciable adverse and beneficial impacts on the overall cumulative effects on stormwater and floodplain resources.

## **Conclusion**

**Stormwater.** Under alternative 4, impacts on stormwater would be adverse from an approximately 5-acre increase in impervious surfaces within the Cedar Pass area. Impacts from the restoration of natural drainage patterns south of the proposed headquarters and improvements to the drainage channel east of the cabin court would result in direct, long term, beneficial impacts.

**Floodplains.** Under alternative 4, there would be direct, long-term, adverse impacts on floodplains resulting from the construction of a new visitor center parking lot and the Cedar Pass Lodge laundry building. This development would reduce the ability of the floodplain to store floodwaters, filter out nutrients and sediments, recharge groundwater aquifers, and exacerbate flooding concerns at downstream locations similar to alternatives 2 and 3.

Under alternative 4, there would also be direct, long-term, beneficial impacts. Alternative 4 would restore the natural floodplain south of the proposed headquarters building by removing the majority of the existing parking lot, improving the quantity and quality of vegetation, improving opportunities for infiltration and ground water recharge, and restoring the natural surface water flows. Culverts underneath the bus/RV parking lot and Ben Reifel Road would still be required to transport flood and stormwaters downstream. As described for alternatives 2 and 3, the reorientation of the amphitheater would have direct, long-term, and beneficial impacts by improving stormwater flow and reducing the amount of sedimentation from the adjacent buttes. Similarly, relocating the tent sites currently within the floodplain would reduce flood risks and have long-term, beneficial impacts. Lastly, the drainage channel east of the lodge would be repaired to alleviate flooding into the cabin court, resulting in direct, long-term, beneficial impacts on stormwater and floodplains because drainage patterns would be improved to prevent erosion and sedimentation and reduce the likelihood of flooding within the development footprint.

Alternative 4 would contribute appreciable adverse and beneficial impacts on the overall cumulative effects on stormwater and floodplain resources.

## **VISITOR EXPERIENCE AND SAFETY**

### **METHODOLOGY AND ASSUMPTIONS**

Direct impacts on visitor experience were evaluated based on the following four factors:

- **Capacity:** Increasing the capacity of facilities, outdoor program and gathering areas, roads, and parking areas to accommodate increasing numbers of park visitors would result in long-term, beneficial impacts, while the removal of facility space for visitor programming and amenities and parking spaces would result in long-term, adverse impacts.
- **Visitor amenities:** An increase in the quantity and quality of visitor amenities, including but not limited to food service and restaurant space, retail areas, restrooms, amphitheater and auditorium seating, and visitor lodging and camping areas would result in long-term, beneficial impacts, while a reduction in these facilities would result in long-term, adverse impacts.
- **Pedestrian and bicycle trails:** Non-vehicular multiuse trails improve visitor access to facilities in the Cedar Pass area and enhance visitor's enjoyment of the park resources. New bicycle and pedestrian trails and improvements to the existing social trails would be considered a long-term, beneficial impact, while the removal of this infrastructure would be considered a long-term, adverse impact. Formalized trails with interpretive and wayfinding signage would improve the visitor experience compared to informal social trails.

- **Construction-related impacts:** Increased noise levels, changes to the views and vistas, and access constraints imposed during construction would result in short-term, adverse impacts on the visitor experience. These impacts would cease once construction is completed.

Direct impacts on visitor safety were evaluated based on the following three factors:

- **Pedestrian-vehicle conflicts:** Pedestrian-vehicle conflicts occur in areas where pedestrians must cross in the path of vehicular traffic, either along a main park roadway, such as Badlands Loop Road; a local park roadway, such as Ben Reifel Road; or within a parking lot. Pedestrian-vehicle conflicts could also occur at gaps in the pedestrian network where pedestrians must walk along the side of a vehicular road to access a park destination. These impacts would be minimized by providing separate pedestrian paths that parallel the road and controlled access at intersections designed with appropriate pavement striping and signage that minimize pedestrian exposure to vehicles. The smallest width for safe pedestrian passage across a driveway or road would be 24 feet, which would accommodate two 12-foot lanes.
- **Vehicle-vehicle conflicts:** Vehicle-vehicle conflicts occur at intersections of a parking lot, driveway, main roadway, or parking area with geometry that creates a limited space for recreational vehicles or buses to maneuver or with pavement markings that do not adequately separate travel lanes and direct traffic. These impacts would be minimized by improving circulation patterns to allow larger vehicles such as recreational vehicles and buses to maneuver without the need to reverse their direction and reducing the pavement width along the driveways connecting parking lots and facilities to Badlands Loop Road to 24 feet or two 12-foot travel lanes.
- **Emergency vehicle access:** To ensure adequate life safety for visitors, emergency vehicles must have access to places where visitors congregate in the Cedar Pass area, including the visitor center, Cedar Pass Lodge and cabins, amphitheater, and campsites. These impacts would be minimized by improving the parking area circulation at the visitor center and widening narrow roadways such as Campground Loop Road.

## ALTERNATIVE 1: NO ACTION

### Analysis

**Visitor Experience.** Under alternative 1, visitor experience at Cedar Pass would continue to be hampered by a lack of capacity and amenities in the visitor center, Cedar Pass Lodge, campground, and other visitor facilities, as well as a lack of indoor and outdoor space for park programming and other interpretive activities. Continued adverse impacts at the visitor center would include:

- a lack of capacity in outdoor program areas and picnic areas;
- congestion and crowding in the lobby and front desk;
- inefficient movement of visitors throughout the visitor center due to inefficient layout of functional elements;
- lack of space for visitors to safely shelter during extreme weather events;
- insufficient space for visitor drop off;
- lack of parking for buses, recreational vehicles, and other large vehicles;
- lack of amenities for time-constrained visitors, such as restrooms accessible from both inside and outside the visitor center and easily accessible drinking fountains and visitor center store;

- a lack of permanent space for the paleontology lab, which occupies the classroom in the visitor center and prevents that space from being used for other interpretive programming;
- operating the paleontology lab in classroom space further adversely affects the visitor experience because the staff library is used for visitor educational programs during inclement weather because indoor classroom space is not available; and
- the linear flow in the museum exhibits causes congestion and frustration for visitors who want to follow their own interests through the museum exhibits.

Continued adverse impacts at the Cedar Pass Lodge would include:

- insufficient capacity in the check-in and dining area during peak season, causing time-constrained visitors, particularly those with scheduled tours, to be unable to enjoy a sit-down meal due to long wait times;
- lack of grab-and-go food service to accommodate time-constrained visitors;
- lack of conference and meeting space to accommodate larger gatherings of visitors;
- insufficient outdoor dining areas;
- congestion and crowding throughout the Cedar Pass Lodge;
- lack of capacity and space for cabin check-in activities;
- occasional disruptions of services during inclement weather caused by roof leaks resulting from structural problems with the building; and
- lodging capacity that does meet visitor demand during peak season.

Continued adverse impacts at the campground and amphitheater would include:

- inadequate number of sites to meet visitor demand;
- congestion near the campground entrance and along the campground loop roads;
- vehicle congestion caused by the current location of the dump station;
- a lack of seating at the amphitheater, resulting in visitors using the adjacent buttes and other rock formations for overflow seating;
- light pollution from passing vehicles during nighttime presentations at the amphitheater; and
- inability to provide a variety of programming beyond slide shows at the amphitheater.

Additionally, visitors would continue to use informal social trails within the Cedar Pass area and walk and bicycle along vehicular roads with inadequate pedestrian and bicycle facilities. There would be no construction-related impacts on visitor use and safety because no construction activities would occur.

**Visitor Safety.** Under alternative 1, pedestrian-vehicle conflicts would continue to occur at four locations surrounding the Ben Reifel Visitor Center, Cedar Pass Lodge parking area, and along the campground loop roadways as described in chapter 3. The configuration of the Cedar Pass Lodge parking area would continue to create pedestrian-vehicle conflicts because of the wide driveways connecting Badlands Loop Road and an approximately 140-foot-long pedestrian exposure to vehicles. The campground loop road would continue not to separate pedestrian and vehicle facilities, increasing the risk of pedestrian-vehicle conflicts.

Vehicle-vehicle conflicts between recreational vehicles, buses, and personally operated vehicles would continue to occur at parking lot entrance and exit points along Ben Reifel Road, at intersections between the Cedar Point Lodge parking area and Badlands Loop Road, and along the narrow campground loop roads as described in chapter 3. Parking areas along Ben Reifel Road have inadequate space to safely

maneuver recreational vehicles, buses, and large personally operated vehicles, which further exacerbates the risk of vehicle-vehicle conflicts. The locations of pedestrian-vehicle and vehicle-vehicle conflicts under alternative 1 are shown in figure 14.

Lastly, some road and parking areas within the Cedar Pass area would continue to be inadequate for emergency vehicle access. The Ben Reifel Road parking area and campground loop roadway would continue to provide inadequate space for emergency vehicle access, especially a full-sized fire engine.

### **Cumulative Impacts**

Past, present, and reasonable foreseeable future actions include the Loop Road Cedar Pass Roadway Rehabilitation, North Unit Bison Resource Stewardship Plan, and the Loop Road and Conata Road Engineering Study. The past Badlands Loop Road rehabilitation has stabilized the road. The construction of stability buttresses approximately 0.5-mile east of the Ben Reifel Visitor Center ensures safe travel for visitors, employees, and emergency vehicles to access Cedar Pass from the east through the Badlands Northeast Entrance Station, resulting in long-term, beneficial impacts. Present and reasonably foreseeable actions to conduct a loop road engineering study could lead to further safety improvements along Badlands Loop Road for vehicles, bicyclists, and pedestrians would result in long-term, beneficial impacts. Past, present, and reasonably foreseeable actions would result in long-term, beneficial impacts on visitor experience by increasing the accessibility of the Cedar Pass area for visitors. In addition, the addition of bison to the north unit within the Cedar Pass area would enhance the visitor experience, also resulting in long-term, beneficial impacts.

Alternative 1 would contribute direct, long term, adverse impacts on the overall cumulative effects to visitor experience because the lack of amenities and increasing visitor numbers would continue to adversely affect visitor experience. Similarly, alternative 1 would contribute direct, long-term, adverse impacts on the overall cumulative effects to visitor safety because vehicle-vehicle, pedestrian-vehicle, and emergency access conflicts would continue at Cedar Pass. The impacts from alternative 1, when considered together with other past, present, and reasonably foreseeable actions would result in direct, long-term, beneficial impacts as a result of safety and accessibility improvements along the Loop Road and the introduction of bison ranges to the Cedar Pass area as well as direct, long-term, adverse impacts from continued inadequate capacity in visitor facilities, lack of visitor amenities, and continued conflicts between pedestrians and vehicles. Alternative 1 would contribute all adverse impacts on the overall cumulative effects to visitor experience and safety in the Cedar Pass area.

### **Conclusion**

Under alternative 1, there would be no new impacts on visitor experience and safety. Direct, long-term, adverse impacts would continue as a result of inadequate capacity in visitor facilities, lack of visitor amenities and space for park programming, limited emergency vehicle access, and locations where pedestrian, bicycle, and vehicular movements would continue to conflict. There would be no short-term impacts under alternative 1 because no construction activities are planned that would disrupt the auditory environment or restrict visitor access to portions of the Cedar Pass area. Alternative 1 would contribute all adverse impacts to the overall cumulative effects on visitor experience and safety.

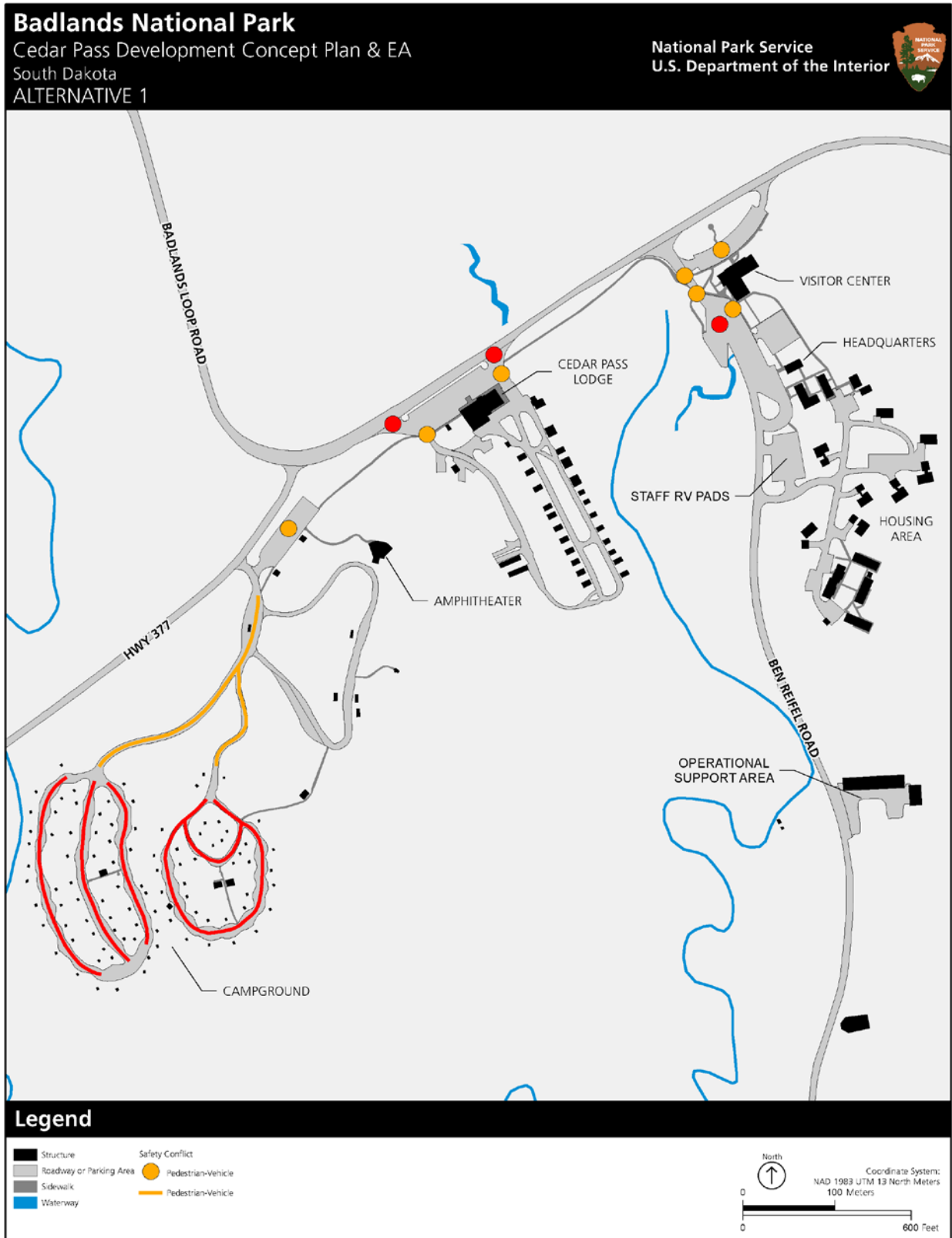


FIGURE 14: VISITOR SAFETY CONDITIONS UNDER ALTERNATIVE 1

**ALTERNATIVE 2: PRESERVE AND RESTORE MISSION 66 AT CEDAR PASS****Analysis**

**Visitor Experience.** Under alternative 2, the visitor experience at Cedar Pass would be improved by adding amenities, increasing facility capacity, and enlarging and enhancing indoor and outdoor space for park programming and other interpretive activities in the visitor center, Cedar Pass Lodge, and campground and amphitheater development clusters. The renovation of the Ben Reifel Visitor Center, along with other improvements within this development cluster, would result in direct, long-term, beneficial impacts on visitor experience from the following improvements.

- Creating a permanent paleontology lab and dedicated classroom space would improve the visitor experience by increasing the capacity and quality of interpretive space and ensuring a dedicated space for both a permanent paleontology lab and other interpretive programming in the classrooms.
- Expanding the lobby and interpretive sales area would improve visitor experience by reducing congestion and improving the flow of visitors in these areas, making it easier for visitors to access orientation and services.
- Expanding the existing exhibition and theatre space as an auditorium suitable for a variety of presentation formats would improve visitor experience by increasing the capacity and quality of space for interpretive programming and park events.
- Arranging interior functions in logically related spaces would improve visitor flow and improve the view of Badlands Wall from within the visitor center. The Mission 66-era flagpole, sign, and parking lot and Badlands Loop Road would remain in the middle ground between the visitor and views of the Badlands Wall.
- Locating the drinking fountains, restrooms (accessible from both inside and outside the visitor center), and the visitor center store would accommodate the needs of time-constrained bus tour groups without impeding the experience of other visitors.
- Expanding the outdoor programming area for visitors would increase the capacity of the park to provide outdoor interpretive programming.
- Installing a shaded walkway would provide protection from the heat for visitors as they walk from the parking lot to the visitor center. Constructing a new bus drop off area would improve the visitor experience by providing greater convenience to visitors, particularly tour bus groups.
- Widening of the Mission 66-era front parking lot by approximately 10 feet would better accommodate larger vehicles and prevent congestion and queueing.
- Adding 78 visitor vehicle stalls and 1 bus stall to the parking area south of the visitor center would provide additional capacity to accommodate increasing visitor numbers.

However, removing five RV stalls in the visitor center development cluster would result in direct, long-term, adverse impacts on RV users who would experience a decrease in available parking capacity.

The renovation and expansion of the Cedar Pass Lodge by approximately 3,000 SF across two buildings, the addition of seven lodging units, and other improvements within this development cluster would result in direct, long-term, beneficial impacts on visitor experience from the following improvements.

- Additional space would be added for the lobby, kitchen, food storage, dining room, grab-and-go food service, retail storage, and guest conference rooms and meeting space in the main lodge building. The interior arrangement of functions would be adjusted to reduce congestion and improve the flow of visitors, making it easier for visitors to access dining and retail services.

Furthermore, these improvements would add amenities for time-constrained visitors, increase the dining capacity of the Cedar Pass Lodge to accommodate increasing visitor numbers, and accommodate larger gatherings of visitors in meeting rooms and conference spaces.

- A separate lodge check-in building and parking area would improve visitor flow and provide adequate capacity to comfortably accommodate the lodge check-in experience during peak season, separate from visitors wishing to access dining and retail services or congregate in the surrounding outdoor gathering areas. Locating the lodge check-in building along Cabin Loop Road, directly adjacent to the primary cabin loop, would better separate cabin-oriented vehicle and pedestrian traffic from traffic related to the dining and retail amenities in the main lodge and improve visitor flow and the efficiency of the check-in process.
- A new 450-SF outdoor deck and patio would improve the visitor experience by adding capacity for outdoor gathering and dining space for park visitors.
- Six additional cottage units would provide greater lodging capacity to meet increasing demand.
- Parking would be expanded to accommodate up to four additional vehicle visitor stalls and a 150-foot space for bus and RV parking, which is not currently accommodated in this area. These parking improvements would increase the parking capacity of the lodge to accommodate increasing visitor numbers and provide an amenity to visitors using recreational vehicles and tour bus groups.

The following improvements within the campground and amphitheater development cluster would enhance the visitor experience through the following improvements.

- Relocating the dump station adjacent to the campground entrance would improve visitor flow and reduce congestion on campground roadways because it would locate this amenity in a more central and accessible location at the entrance to the campground, reducing the need for visitors to drive through the campground loop roads to dispose of their refuse.
- Adding 5 camper cabins and 36 new campsites would provide additional capacity to meet increasing demand for overnight stays within the Cedar Pass area. The number of electric campsites, intended for small and large recreational vehicles, would increase from 0 to 49. This would improve the visitor experience by meeting the needs for visitors wanting to charge their electronic devices, as well as accommodate RV camping. However, individual tent sites would be reduced from 92 to 70, resulting in direct, long-term, adverse impacts on tent campers because of reduced capacity.
- Adding one restroom facility and two additional shower facilities would support the increased capacity for overnight stays.
- Adding trees and vegetation would provide shade and privacy for a portion of the tent sites, thereby improving the visitor experience in these locations.
- Adding a drop-off area at the amphitheater, as well as an access aisle looping through the adjacent parking lot, would improve vehicle flows for visitor drop off and emergency access. This change would improve visitor experience by making it easier and safer for visitors to access the amphitheater, particularly tour groups and visitors using large vehicles.
- Reorienting and expanding the amphitheater by 100 seats would enable more visitors to participate in park programming and reduce the need for visitors to use the surrounding buttes for informal seating. This change would improve visitor experience by increasing capacity and enabling the park to provide a greater variety of interpretive programming to visitors.

- Demolishing the existing shelter and constructing a new larger interpretive shelter that includes space for picnicking and an outdoor classroom would increase the amount of available space for visitor programming, interpretive programs, and informal visitor uses such as picnicking. This change would improve visitor experience by increasing the capacity of this facility and creating additional amenities for picnicking and interpretive programming.

New interpretive and multiuse trails throughout the Cedar Pass area would enhance the visitor experience by providing enjoyable modes of travel and enhancing connectivity between visitor services and amenities located in each development cluster. Existing informal and social trails would be formalized, and appropriate directional and interpretive signage would be added to assist visitors in wayfinding and learning about park resources.

Direct, short-term, adverse impacts on visitor experience would occur during construction of the proposed facilities and infrastructure under alternative 2. These adverse impacts would result from increased noise levels from the daytime operation of construction equipment and vehicles. Adverse impacts would also be caused by changes to the visual environment from the presence of construction laydown areas, housing materials, and equipment whose presence is not compatible with the cultural landscape of Cedar Pass, and the presence of construction equipment, vehicles, and/or materials within vistas in the Cedar Pass area. Additionally, access to visitor facilities may be limited or prohibited during construction to ensure visitor safety in active construction zones. These impacts would be mitigated by implementing construction best practices, providing temporary pedestrian connections, installing signs to guide pedestrians and vehicles, and scheduling construction during non-peak tourist times. The displacement of existing parking during construction would disturb typical arrival and departure patterns, described in further detail below.

**Visitor Safety.** Overall, proposed development under alternative 2 would reduce pedestrian-vehicle conflicts, resulting in direct, long-term, beneficial impacts. The redesign of parking areas serving the Ben Reifel Visitor Center would improve pedestrian safety because the four existing pedestrian crossings would be reduced to two, one along Ben Reifel Road providing access from the RV and bus parking area, and one through the middle of the Mission 66 parking lot. The redesigned Cedar Pass Lodge parking area would continue to create pedestrian-vehicle conflicts due to an increase from two to three driveways with pedestrian crossings serving the Cedar Pass Lodge. However, the total length of pedestrian crossings would be reduced by approximately 88 feet, thus reducing the amount of time a pedestrian would be exposed to cross traffic. The campground loop roadway would continue to be without separate pedestrian and vehicle facilities; therefore, visitors wishing to walk from the campsites to Cedar Pass Lodge and visitor center would continue to walk up to a third of a mile on campground loop roadway.

As shown in figure 15, all existing vehicle-vehicle conflicts would be removed under alternative 2, resulting in direct, long-term, beneficial impacts. Redesigning the existing parking areas and driveways serving the Ben Reifel Visitor Center and Cedar Pass Lodge and widening the amphitheater parking lot and the campground loop road would minimize the potential for vehicle-vehicle conflicts to occur because standard 12-foot travel lanes would be implemented, with necessary pavement striping in parking lots, driveways, and on Ben Reifel Road, and the turning radii for buses and other large vehicles would be improved. The parking facilities serving the Ben Reifel Visitor Center would be widened and turning radius increased to accommodate buses and recreational vehicles. These improvements would reduce the occurrence of multipoint turns for buses and recreational vehicles exiting the parking area, and would reduce the amount of time required for larger vehicles to park. All driveways serving the Cedar Pass Lodge would be reduced from a maximum of 85 feet to a more typical width around 24 feet with pavement markings, which would reduce conflicts between vehicles entering and exiting simultaneously. The campground loop roads would be widened an average of 27 feet. The added road width would better accommodate recreational vehicles while allowing an active lane down the middle of the roadway accessible to large vehicles such as recreational vehicles. These improvements would provide more space for vehicles to safely pass through the campground area and reduce the chance for a sideswipe to occur.

Redesigning parking and access for the Ben Reifel Visitor Center, widening the campground loop roads, and improving the amphitheater parking lot would improve access for emergency vehicles by providing more space for emergency vehicles to maneuver.

### **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternative 1. The impacts from alternative 2, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, beneficial impacts as a result increasing visitor amenities and facility capacity; improving vehicle, pedestrian, and bicycle safety at Cedar Pass and along the Loop Road; and reducing the total number of locations where vehicle-vehicle, pedestrian-vehicle, and emergency access conflicts occur at Cedar Pass. Alternative 2 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects on visitor experience and safety because of increased capacity of visitor facilities and improved quality and quantity of amenities offered in the Cedar Pass area.

### **Conclusion**

Under alternative 2, overall impacts on visitor experience would be direct, long term, and beneficial impacts. New interpretive and multiuse trails would enhance visitor experience by providing enjoyable modes of travel and enhancing connectivity between visitor services and amenities located in each development cluster. The renovated visitor center would improve visitor flows; reduce congestion; and make it easier for visitors to access orientation, information, and interpretation-related services and amenities. The improved Cedar Pass Lodge, reconfigured and expanded parking areas, expanded campground, and increased amphitheater seating would substantially improve visitor amenities and capacity, and enhance accessibility for visitors using large personal vehicles, recreational vehicles, or buses, resulting in long-term, beneficial impacts. However, removing 5 RV stalls in the visitor center development cluster and 22 individual tent sites would result in direct, long-term, adverse impacts in these locations where capacity has been reduced.

Proposed development under alternative 2 would reduce pedestrian-vehicle conflicts, resulting in direct, long-term, beneficial impacts. The redesign of parking areas serving the Ben Reifel Visitor Center would reduce the number of pedestrian-vehicle conflict locations by two. Within the Cedar Pass Lodge development cluster, there would be one additional location where pedestrian and vehicle movements would conflict, but the total length of pedestrian crossings would be reduced by 88 feet.

Proposed development under alternative 2, including the redesign of existing parking areas and driveways serving the Ben Reifel Visitor Center and Cedar Pass Lodge and the widening of the campground loop road would remove all existing vehicle-vehicle conflicts, resulting in direct, long-term, beneficial impacts. Vehicle-vehicle conflicts caused by larger vehicles would be minimized by widening parking lots and roads and designing intersections to accommodate the turning radii of larger vehicles.

Lastly, the redesign of parking and access for the Ben Reifel Visitor Center, widening of the campground loop roads, and improvements to the amphitheater parking lot would improve access for emergency vehicles by providing more space for emergency vehicles to maneuver. Alternative 2 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects to visitor experience and safety.

# Badlands National Park

Cedar Pass Development Concept Plan & EA

South Dakota

ALTERNATIVE 2

National Park Service  
U.S. Department of the Interior

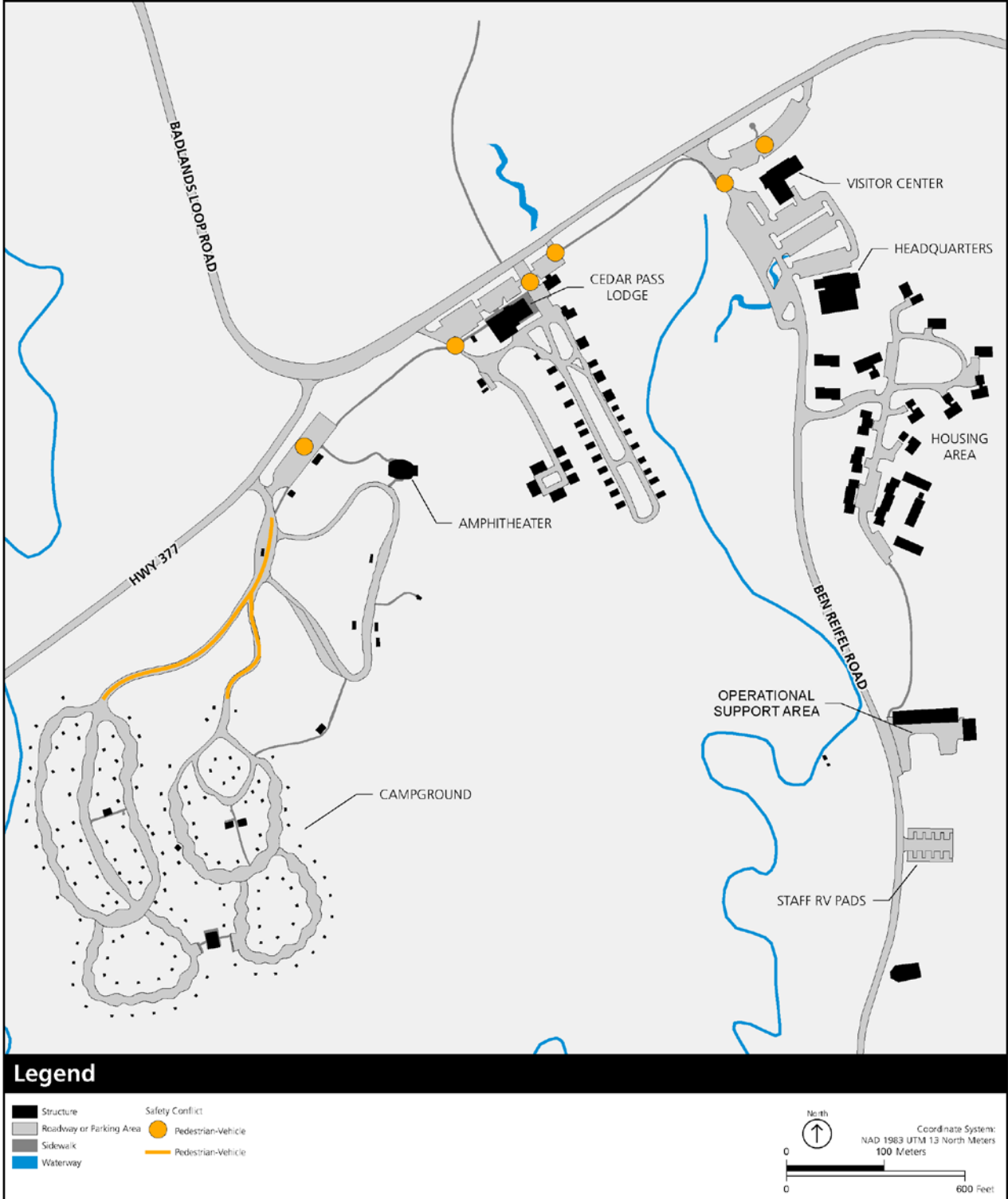


FIGURE 15: VISITOR SAFETY CONDITIONS UNDER ALTERNATIVE 2

### **ALTERNATIVE 3: MINIMIZE BUILDING FOOTPRINT**

#### **Analysis**

**Visitor Experience.** As described under alternative 2, direct, long-term, beneficial impacts on visitor experience would occur as a result of the addition of amenities, increases in facility capacity, and enlargement and enhancement of indoor and outdoor space for park programming and other interpretive activities in the visitor center, Cedar Pass Lodge, and campground and amphitheater development clusters.

The construction of a new visitor center and headquarters building, along with other improvements within this development cluster, would result in direct, long-term, beneficial impacts on visitor experience as described under alternative 2, with the following differences.

- While the visitor center under alternative 3 would be housed in a new consolidated visitor center and headquarters facility, visitor and park staff functions, including interior spaces, building access, and parking would be sufficiently separated to avoid employee activity infringing on the visitor experience and causing adverse impacts.
- In addition to the improvements described under alternative 2, alternative 3 would increase the magnitude of beneficial impacts at the visitor center by further improving the view of the Badlands Wall from multiple vantage points within the visitor center, with only Badlands Loop Road in the middle ground between the visitor and views of the Badlands Wall.
- The benefits associated with widening the Mission 66-era front parking lot described for alternative 2 would not apply to alternative 3 because this parking lot would be demolished to accommodate the construction of a new consolidated visitor center and headquarters building.
- The magnitude of beneficial impacts associated with the addition of visitor vehicle stalls under alternative 3 would be less than alternative 2. Under alternative 3, 54 visitor vehicle stalls would be added to the parking area south of the visitor center, 24 fewer than would be added under alternative 2. As described for alternative 2, the reduction of 5 RV stalls in the visitor center development cluster would result in direct, long-term, adverse impacts on RV users who would experience a decrease in available parking capacity.

The renovation and expansion of the Cedar Pass Lodge by approximately 3,000 SF, the addition of 8 lodging units, and other improvements within this development cluster would result in direct, long-term, beneficial impacts on visitor experience as described for alternative 2, with the following differences:

- Alternative 3 would further improve the visitor experience by increasing the amount of available cottage units by 8 (1 more than under alternative 2).
- The magnitude of beneficial impacts associated with the addition of visitor vehicle stalls and bus/RV parking adjacent to the Cedar Pass Lodge under alternative 3 would be slightly less than alternative 2. Three visitor vehicle stalls would be added to the parking area under alternative 3 (1 fewer than under alternative 2), and the bus and RV parking area would total 120 feet (30 feet less than under alternative 2).

The improvements within the campground and amphitheater development cluster would result in direct, long-term, beneficial impacts on visitor experience as described for alternative 2, with the following differences.

- Alternative 3 would further improve the visitor experience for RV camping with the increase in RV/electric campsites from 0 to 58 (9 more than under alternative 2).

- The magnitude of beneficial impacts associated with the addition of new campsites would be less than under alternative 2. Under alternative 3, 14 new campsites would be added (22 fewer than under alternative 2).
- The magnitude of adverse impacts on tent campers from the loss of individual tent sites under alternative 3 would be greater than under alternative 2; under alternative 3, individual tent sites would be reduced from 92 to 36 (34 fewer than under alternative 2).

Lastly, the beneficial impacts associated with pedestrian and trail improvements and the adverse impacts resulting from construction activities under alternative 3 would be the same as those described for alternative 2.

**Visitor Safety.** Proposed development under alternative 3 would reduce pedestrian-vehicle conflicts. The redesign of existing parking areas serving the Ben Reifel Visitor Center would improve pedestrian safety, resulting in direct, long-term, beneficial impacts similar to those described for alternative 2. Under alternative 3, the four existing pedestrian crossings surrounding Ben Reifel Visitor Center would be reduced to one crossing along Ben Reifel Road. The Cedar Pass Lodge parking area would maintain two pedestrian crossings; however, the crossing lengths would be approximately 35 feet shorter than under alternative 1, thus reducing the amount of time a pedestrian would be exposed to cross traffic. Overall, beneficial impacts on pedestrian safety would occur because of improved pedestrian safety conditions near the visitor center and Cedar Pass Lodge. As described under alternatives 1 and 2, the campground loop roadway would not contain separate pedestrian and vehicle facilities; however, visitors accessing the amphitheater from the campground would have a dedicated trail approximately 200 feet in length between the end of the group loop and the amphitheater.

As shown in figure 16, all existing vehicle-vehicle conflicts would be removed under alternative 3, and no new conflicts would be created, resulting in direct, long-term, beneficial impacts like those described under alternative 2. While the exact configuration of parking areas, driveways, and roadways would be different from alternative 2, the redesign of existing parking areas and driveways serving the visitor center and Cedar Pass Lodge, widening of the campground loop road, and reorientation of the amphitheater parking lot would include 12-foot travel lanes with requisite pavement striping that would accommodate the turning radii of large vehicles such as buses and recreational vehicles and improve access for emergency vehicles as described for alternative 2.

### **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternative 1. The impacts from alternative 3, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, beneficial impacts as a result of increasing visitor amenities and facility capacity; improving vehicle, pedestrian, and bicycle safety at Cedar Pass and along the Loop Road; and reducing the total number of locations where vehicle-vehicle, pedestrian-vehicle, and emergency access conflicts occur at Cedar Pass. Alternative 3 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects on visitor experience and safety because of increased capacity of visitor facilities and improved quality and quantity of amenities offered in the Cedar Pass area.

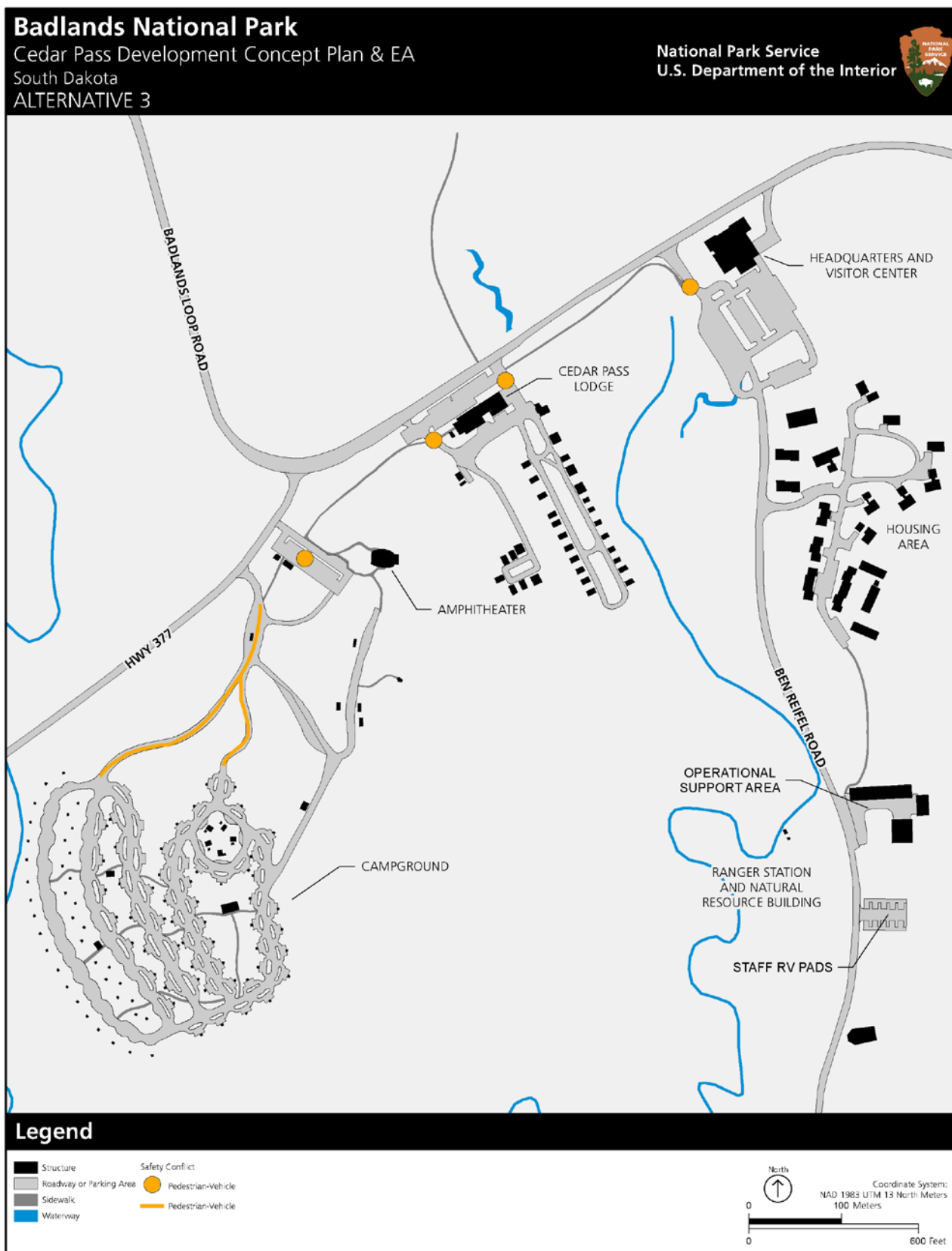


FIGURE 16: VISITOR SAFETY CONDITIONS UNDER ALTERNATIVE 3

## Conclusion

Under alternative 3, like alternative 2, overall impacts on visitor experience would be direct, long-term, and beneficial at the visitor center, Cedar Pass Lodge, campground, and amphitheater. Alternative 3 would result in direct, long-term, beneficial impacts by removing all features except Badlands Loop Road from the middle ground between the visitor and views of the Badlands Wall, adding 8 visitor lodging units at the Cedar Pass Lodge, and including 58 RV/electric campsites. Beneficial impacts would also result from the addition of 54 visitor vehicle stalls at the visitor center, 3 visitor vehicle stalls, and a 120-foot RV parking area at the Cedar Pass Lodge, and adding 14 new campsites to the campground area. The adverse impacts on tent campers from the loss of individual tent sites under alternative 3 would be greater than alternative 2 because only 39 individual tent sites would be retained (31 fewer than under alternative 2).

Proposed development under alternative 3 would reduce pedestrian-vehicle conflicts, resulting in direct, long-term, beneficial impacts. The redesign of parking areas serving the consolidated visitor center and headquarters building would reduce the number of pedestrian-vehicle conflict locations by three. Within the Cedar Pass Lodge development cluster, two locations would remain where pedestrian and vehicle movements would conflict.

Proposed development under alternative 3, including the redesign of existing parking areas and driveways serving the Ben Reifel Visitor Center, Cedar Pass Lodge, and the widening of the campground loop road, would remove all existing vehicle-vehicle conflicts, resulting in direct, long-term, beneficial impacts. Vehicle-vehicle conflicts caused by larger vehicles would be minimized through parking lot and road widening and designing intersections to accommodate the turning radii of larger vehicles.

The redesign of parking and access for the Ben Reifel Visitor Center, widening of the campground loop roads, and improvements to the amphitheater parking lot would improve access for emergency vehicles by providing more space for emergency vehicle to maneuver. Direct, short-term, adverse impacts during construction would be the same as those presented for alternative 2. Lastly, alternative 3 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects to visitor experience and safety.

## ALTERNATIVE 4: REDEFINE THE EXPERIENCE AT CEDAR PASS

### Analysis

**Visitor Experience.** As described under alternatives 2 and 3, direct, long-term, beneficial impacts on visitor experience would occur as a result of the addition of amenities, increases in facility capacity, and enlargement and enhancement of indoor and outdoor space for park programming and other interpretive activities in the visitor center, Cedar Pass Lodge, and campground and amphitheater development clusters.

The construction of a new visitor center between the existing Ben Reifel Visitor Center and Cedar Pass Lodge would result in direct, long-term, beneficial impacts on visitor experience as described under alternative 2, with the following differences.

- The improvements to visitor views of the Badlands Wall would be the same as described under alternative 3.
- Similar to alternative 3, benefits associated with the widening of the Mission 66-era front parking lot described for alternative 2 would not apply to alternative 4 because this parking lot would no longer accommodate visitors and would instead be used for employee parking.

- The magnitude of beneficial impacts associated with the addition of visitor vehicle stalls under alternative 4 would be less than alternative 2 but more than alternative 3. Under alternative 4, 120 visitor vehicle stalls, an increase of 66 over the baseline condition, would be added to a new parking area south of the proposed visitor center (12 fewer total visitor vehicle stalls than are proposed under alternative 2, and 12 more visitor vehicle stalls than are proposed under alternative 3).
- The magnitude of adverse impacts associated with the reduction of RV stalls would be less than that described for alternatives 2 and 3, because alternative 4 would include 12 RV stalls (2 more than are proposed under alternatives 2 and 3, and 3 less than the baseline condition).
- The relocation of the visitor center would increase the distance between the bus and RV parking and the visitor center, resulting in direct, long-term, adverse impacts. Under alternatives 1, 2, and 3, visitor, bus, and RV parking area would be adjacent to the visitor center. Under alternative 4, visitors would have to walk approximately 800 feet between the visitor center entrance and this parking area, reducing visitor convenience and accessibility to the visitor center for tour bus and RV visitors.

The demolition of the existing facility and construction of a new Cedar Pass Lodge and separate check-in building, addition of 15 lodging units, and other improvements within this development cluster would result in direct, long-term, beneficial impacts on visitor experience as described under alternative 2, with the following differences.

- Alternative 4 would further improve the visitor experience by increasing the amount of available cottage units by 15 (8 more than under alternative 2 and 7 more than under alternative 3).
- The magnitude of beneficial impacts associated with the addition of bus/RV parking adjacent to the Cedar Pass Lodge under alternative 4 would be slightly less than alternative 2. Under alternative 4, the bus and RV parking area would total 120 feet (30 less than under alternative 2). Alternatively, this site could accommodate 30 visitor vehicle stalls.
- The magnitude of beneficial impacts associated with the addition of a separate lodge check-in building would be less than that described for alternative 2 because its location, on the east side of the lodge, is farther away from the primary cabin loop than under alternative 2, decreasing the separation of cabin-oriented vehicle and pedestrian traffic and reducing improvements in visitor flow relative to alternative 2.

The improvements within the campground and amphitheater development cluster would be the same as described for alternative 2 and result in the same level of impacts. Likewise, the construction activities under alternative 4 would result in the same impacts on the visitor experience as described for alternatives 2 and 3.

**Visitor Safety.** Proposed development under alternative 4 would reduce pedestrian-vehicle conflicts, resulting in direct, long-term, beneficial impacts. As described under alternative 2, the four existing pedestrian-vehicle conflict locations near Ben Reifel Road would be reduced to two. However, the creation of a parking area to serve the new visitor center would slightly worsen pedestrian safety in this location by adding a new pedestrian crossing. Visitors wishing to walk between the new visitor parking area and the bus and RV parking area or Mission 66 flagpole and sign would be required to cross a new 24-foot driveway where vehicles and tour buses would be entering and exiting the facility, resulting in localized direct, long-term, adverse impacts. Impacts on pedestrian-vehicle conflicts in the Cedar Pass Lodge parking area would be the same as described for alternative 3, while visitor safety impacts in the campground and amphitheater development cluster would be the same as those described for alternative 2.

As shown in figure 17, all existing vehicle-vehicle conflicts would be removed under alternative 4, and no new conflicts would be created, resulting in direct, long-term, beneficial impacts as described under alternative 2. While the exact configuration of parking areas, driveways and roadways differs from alternative 2, the redesign of existing parking areas and driveways serving the visitor center and Cedar Pass Lodge, the widening of the campground loop road, and the widening of the amphitheater parking lot would include 12-foot travel lanes with requisite pavement striping, accommodate the turning radii of large vehicles such as buses and RVs, and improve access for emergency vehicles as described under alternative 2.

### **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternative 1. The impacts from alternative 4, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, beneficial impacts as a result of increasing visitor amenities and facility capacity; improving vehicle, pedestrian, and bicycle safety at Cedar Pass and along the Loop Road; and reducing the total number of locations where vehicle-vehicle, pedestrian-vehicle, and emergency access conflicts occur at Cedar Pass. Alternative 4 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects on visitor experience and safety because of increased capacity of visitor facilities and improved quality and quantity of amenities offered in the Cedar Pass area.

### **Conclusion**

Under alternative 4, there would be overall long-term, beneficial impacts on the visitor experience at the visitor center, Cedar Pass Lodge, campground, and amphitheater. Impacts on visitor experience would be similar to those described for alternatives 2 and 3. With regard to the visitor center, alternative 4 would include 120 visitor vehicle stalls in a new parking area south of the proposed visitor center (an increase of 66 over the baseline condition, and 12 more visitor parking stalls than are proposed under alternative 3). The relocation of the visitor center would increase the distance between the bus and RV parking and the visitor center, resulting in direct, long-term, adverse impacts because visitors would have to walk approximately 800 feet between the visitor center entrance and this parking area, reducing visitor convenience and accessibility for tour bus and RV visitors. However, this configuration would accommodate 12 RV stalls (2 more than are proposed under alternatives 2 and 3, and 3 less than the baseline condition). Impacts on visitor use at the campground and amphitheater would be the same as those described for alternative 2.

Proposed development under alternative 4 would reduce pedestrian-vehicle conflicts, resulting in direct, long-term, beneficial impacts. The design of parking areas serving the new visitor center would reduce the number of pedestrian-vehicle conflict locations by three; however, visitors wishing to access the bus and RV parking area or Mission 66 flagpole and sign would be required to cross a new 24-foot driveway where vehicles and tour buses would be entering and exiting the facility, resulting in a localized direct, long-term, adverse impacts. Impacts on pedestrian-vehicle conflicts in the Cedar Pass Lodge parking area would be the same as those described for alternative 3, while visitor safety impacts in the campground and amphitheater development cluster would be the same as those described for alternative 2.

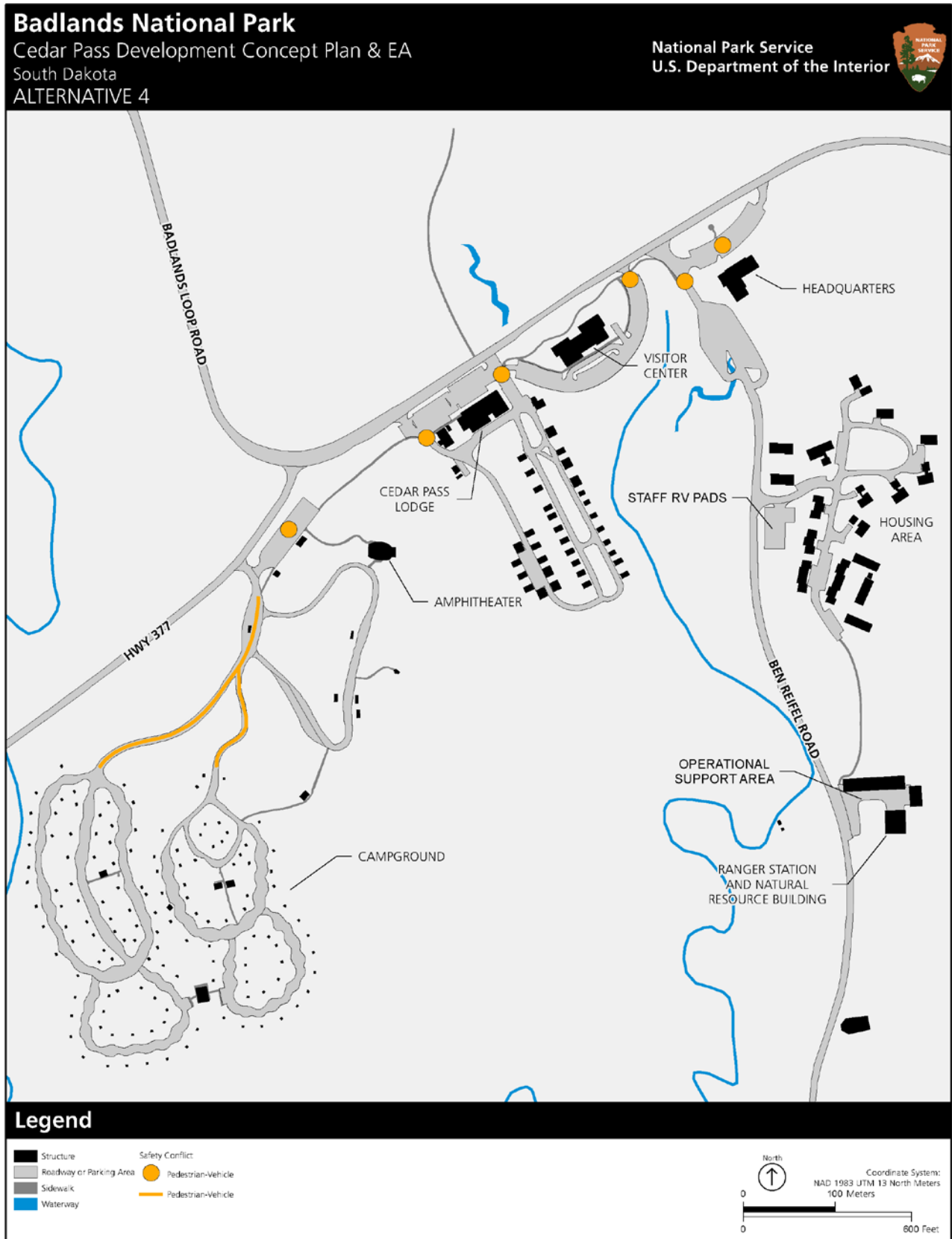


FIGURE 17: VISITOR SAFETY CONDITIONS UNDER ALTERNATIVE 4

Proposed development under alternative 4, including the redesign of existing parking areas and driveways serving the Ben Reifel Visitor Center and Cedar Pass Lodge and the widening of the campground loop road, would remove all existing vehicle-vehicle conflicts, resulting in direct, long-term, beneficial impacts. Vehicle-vehicle conflicts caused by larger vehicles would be minimized through parking lot and road widening and designing intersections to accommodate the turning radii of larger vehicles.

The design of new parking and access for the visitor center, widening of the campground loop roads, and improvements to the amphitheater parking lot would improve access for emergency vehicles by providing more space for emergency vehicle to maneuver. Direct, short-term, adverse impacts during construction would be the same as those presented for alternative 2. Alternative 4 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects to visitor experience and safety.

## **CULTURAL LANDSCAPES**

### **METHODOLOGY AND ASSUMPTIONS**

Potential adverse impacts on the Cedar Pass Area cultural landscape are primarily associated with physical removal or alteration of the contributing elements and features of the landscape. Alterations to the landscape's buildings and structures may be the most visible changes in the action alternatives, although other characteristics including spatial organization, land use, circulation, topography, vegetation, small-scale features, and views and vistas could also be affected by the alternatives evaluated in this development concept plan / environmental assessment.

Changes to historic landscape features would avoid adverse impacts and even result in some beneficial impacts by adhering to the rehabilitation treatment in the *Cedar Pass Developed Area Badlands National Park Cultural Landscape Report* (John Milner Associates 2005). Direct, long-term, and beneficial impacts would result from repair and renovation of historic landscape features that adhere to the rehabilitation standards and provide for the protection of the resources from future degradation. Direct, long-term, and adverse impacts would result from the unnecessary removal of contributing features that could be otherwise rehabilitated. Proposed development would also comply with the Secretary of the Interior's *Standards for the Treatment of Historic Properties, Guidelines for the Treatment of Cultural Landscapes*; Director's Order 28: *Cultural Resource Management Guidelines* (NPS 1998); and all applicable local, state, and federal codes, regulations, and policies. No indirect or short-term impacts are anticipated.

### **ALTERNATIVE 1: NO ACTION**

#### **Analysis**

Under alternative 1, there would be no changes to contributing features and elements of the cultural landscape at Cedar Pass. Therefore, alternative 1 would not result in any impacts on the cultural landscape.

#### **Cumulative Impacts**

Alternative 1 would not contribute any impacts on the overall cumulative effects on the cultural landscape; therefore, there would be no cumulative impacts.

#### **Conclusion**

Under alternative 1, there would be no new impacts on elements of the Cedar Pass cultural landscape. Alternative 1 would not contribute any impacts on the overall cumulative effects on the cultural

landscape. Contributing landscape elements, including structures, circulation, and natural systems would continue to be adversely affected by the lack of upgrades to facilities to meet increased visitation.

## **ALTERNATIVE 2: PRESERVE AND RESTORE MISSION 66 AT CEDAR PASS**

### **Analysis**

Under alternative 2, all proposed development would adhere to the rehabilitation treatment in the *Cedar Pass Developed Area Badlands National Park Cultural Landscape Report* (John Milner Associates 2005), resulting in direct, long-term, beneficial impacts. The existing spatial organization of the Cedar Pass area, consisting of defined and distinct clusters of development, and land use patterns, which are influenced heavily by Mission-66 principles, would be preserved. There would be no changes to distribution of land uses within the Cedar Pass area because each development cluster would expand existing uses and no new uses would be introduced. Similarly, the Mission-66 circulation pattern would remain intact, and all existing roads would retain their existing alignment. New roads would be constructed in the campground and Cedar Pass Lodge development clusters. These new roads would follow the Mission 66-road pattern, which uses curvilinear forms that most likely drew from modernist principles while accommodating a condensed development pattern that disturbs as little land as possible. Intrusive and incompatible alterations to the historic road and community green within Ben Reifel Road would be removed, and the character of the road (narrow pavement with natural drainage to landscaped margins) and recreation space would be restored.

Under alternative 2, changes to structures within the Cedar Pass area would result in direct, long-term, beneficial impacts. Historic structures that contribute to the national register-eligible Cedar Pass Developed Area Historic District, including the Cedar Pass Lodge and outbuildings, Ben Reifel Visitor Center, employee housing facilities, and the campground comfort stations would be rehabilitated and improved in accordance with the rehabilitation treatment described in the cultural landscape report. A more detailed discussion of impacts on historic structures under alternative 2 can be found in “Historic Structures” section. All new structures, including the lodge check-in building, headquarters building, employee housing, and laundry building would be compatible in location, materials, and massing with the historic context of Cedar Pass and adhere to the rehabilitation treatment described in the cultural landscape report. While the reorientation of the amphitheater to improve its function, particularly during nighttime presentations would vary from its historic configuration and orientation and would not adhere to the rehabilitation treatment described in the cultural landscape report, the reorientation of the amphitheater would not alter the historic context of this development cluster, and therefore would not result in adverse impacts. Finally, the historically incompatible and intrusive administrative trailers would be demolished. The historically incompatible and intrusive fire cache building, with its two-stories and contemporary materials would continue to intrude on views of the grasslands and small formations to the south from historic areas within the Cedar Pass area. These ongoing, adverse impacts could be minimized through the introduction of screening along the northern and western edges of the building.

Under alternative 2, the views and vistas of the Cedar Pass landscape would be largely preserved, and the formations in the Cedar Pass area, most importantly the Badlands Wall on the north side of Badlands Loop Road, would continue to define viewsheds within the Cedar Pass area. However, noticeable changes resulting from facility and infrastructure development would occur. The demolition of intrusive and historically incompatible features would improve views of the landscape throughout the Cedar Pass area, resulting in direct, long-term, beneficial impacts. A new lodge check-in building would intrude on views of the Badlands Wall from the Cedar Pass Lodge cabins. Similarly, the addition of employee RV pads and two new campground loops would minimally intrude on expansive views of the grasslands and small formations south of the Cedar Pass area but would keep with the overall character of the landscape. Because all proposed development would adhere to the rehabilitation treatment, these changes to views and vistas would result in overall direct, long-term, beneficial impacts.

With the exception of fill added to elevate the proposed employee RV pads from existing and potential flood zones, there would be no alternations to topography within the Cedar Pass area. The addition of fill in this natural depression would reduce the topographical variation in this location, consistent with the overall flat topography within the development footprint in the Cedar Pass area. Moreover, the location of the RV pads at the southern limit of the study area would not be noticeable from most locations within the Cedar Pass area. Therefore, there would be no noticeable impacts on topography under alternative 2.

Under alternative 2, the quality and quantity of vegetation within the Cedar Pass area would increase. Within the Cedar Pass Lodge development cluster, lawn spaces would be replanted, and additional cedar and deciduous trees would be planted in a pattern consistent with the rehabilitation recommendations. Additional vegetation and tree plantings, including native cottonwood and juniper per Mission 66 planting plans, would occur in the western portions of the campground to help slow erosion. The location and type of other vegetation, including the removal of existing invasive and nonnative plants, would be identified during later design phases. All changes to vegetation within the Cedar Pass area would be consistent with the rehabilitation treatment described in the cultural landscape report, resulting in direct, long-term, beneficial impacts.

Under alternative 2, the entry sign and flagpole adjacent to the Ben Reifel Visitor Center would be retained in their current location, and the relationship between the entry sign and the building, front parking lot, and the overall landscape would be preserved. The location, materials, and style of other small-scale features, such as signage, historic markers, seating, screening at the amphitheater, footbridges and culverts would be identified during later design phases and would be consistent with the rehabilitation treatment described in the cultural landscape report, resulting in direct, long-term, beneficial impacts.

### **Cumulative Impacts**

The past Badlands Loop Road rehabilitation has affected the circulation, views and vistas, and small-scale features of the Cedar Pass landscape along the Badlands Loop Road. Present and reasonably foreseeable actions would include the loop road engineering study, which would continue to improve circulation along Badlands Loop Road, as well as the addition of bison to the north unit within the Cedar Pass area, resulting in direct, long-term, beneficial impacts. The impacts from alternative 2, when considered together with other past, present, and reasonably foreseeable actions would result in direct, long-term, beneficial impacts on the cultural landscape. Alternative 2 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects to the cultural landscape in the Cedar Pass area.

### **Conclusion**

Under alternative 2, all proposed development would adhere to the rehabilitation treatment described in the cultural landscape report, preserving the integrity and character of the cultural landscape and resulting in beneficial impacts on cultural landscapes. New construction would be limited to meet critical park needs in accommodating visitor and staff needs while repairing and protecting the historic fabric of structures, buildings, and other landscape features. New facilities and infrastructure would preserve Mission 66 spatial organization, circulation, and views and vistas.

## **ALTERNATIVE 3: MINIMIZE BUILDING FOOTPRINT**

### **Analysis**

Under alternative 3, all proposed development, including changes to the spatial organization, land use, circulation, views and vistas, topography, vegetation, and small-scale features, would result in the same direct, long-term, beneficial impacts on the cultural landscape as described for alternative 2 and would

adhere to the rehabilitation treatment outlined in the *Cedar Pass Developed Area Badlands National Park Cultural Landscape Report* (John Milner Associates 2005), with the following differences:

- The demolition of the Ben Reifel Visitor Center would result in direct, long-term, adverse impacts on the cultural landscape. Not only would the historic fabric of the structure be destroyed, but the new consolidated visitor center and administration building would also be relocated north of the current Ben Reifel Visitor Center, necessitating the removal of the Mission 66 parking lot and changing the relationship of the historic flagpole and sign to surrounding development. These changes would not meet the Secretary of the Interior's *Standards for the Treatment of Historic Properties*, or adhere to the rehabilitation treatment recommendations for the visitor/administration area described in the cultural landscape report (John Milner Associates 2005). These aspects of alternative 3 would therefore constitute adverse impacts on structures and small-scale features in the Cedar Pass area.
- The addition of a second story to the Cedar Pass Lodge would result in direct, long-term, adverse impacts on the cultural landscape because it would conflict with the characteristic one-story massing style and scale of the Cedar Pass area built environment and intrude on contributing views and vistas from the cabin court north toward the Badlands Wall. The changes to the views from cabins in this development cluster resulting from the construction of a new lodge check-in building described under alternative 2 would not occur under alternative 3.
- At the campground, rather than creating two new campground loops as described under alternative 2, alternative 3 would extend the existing loops to the south complementing the Mission 66 layout and circulation. Moreover, a portion of the group loop would be demolished to accommodate the reoriented amphitheater parking lot while ensuring pedestrian and vehicular traffic are adequately separated for safety. While the roadway configuration would be slightly altered and a portion of the group loop removed, the overall spatial organization and circulation patterns would be consistent with the Mission 66 context, resulting in the same direct, long-term, beneficial impacts described for alternative 2.
- In the operational support area, the addition of a new natural resources and ranger station building would not result in adverse impacts on the cultural landscape related to structures and views. The existing two-story building would block views of the building from historic areas within the Cedar Pass area, and the new building would be compatible in location, materials, and massing with the historic context of Cedar Pass and adhere to the rehabilitation treatment described in the cultural landscape report.

## Cumulative Impacts

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as described for alternative 2, resulting in direct, long-term, beneficial impacts. The beneficial and adverse impacts from alternative 3, when considered together with other past, present, and reasonably foreseeable actions would result in overall direct, long term, beneficial impacts to the cultural landscape. Alternative 2 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects to the cultural landscape in the Cedar Pass area.

## Conclusion

Beneficial impacts on the cultural landscape would be the same as those described for alternative 2. However, alternative 3 would also result in direct, long-term, adverse impacts from the demolition of the historic Ben Reifel Visitor Center and Mission 66 parking lot and the addition of a second story to the Cedar Pass Lodge.

## **ALTERNATIVE 4: REDEFINE THE EXPERIENCE AT CEDAR PASS**

### **Analysis**

Under alternative 4, all proposed development, including changes to the spatial organization, land use, circulation, views and vistas, topography, vegetation, and small-scale features would result in the same direct, long-term, beneficial impacts on the cultural landscape described for alternative 2. In addition, all proposed development would adhere to the rehabilitation treatment outlined in the *Cedar Pass Developed Area Badlands National Park Cultural Landscape Report* (John Milner Associates 2005), with the following differences.

- Rather than rehabilitating and expanding the Ben Reifel Visitor Center as described under alternative 2, alternative 4 would create a new development cluster for a new visitor center building between the existing visitor center and the Cedar Pass Lodge. This new development cluster would preserve the Mission 66-development and land use patterns of defined and distinct clusters of development. The proposed visitor parking lot would not alter existing circulation patterns in existing development clusters and would adhere to the rehabilitation treatment in the cultural landscape report. Therefore, the construction of a new visitor center would avoid adverse impacts.
- The existing Ben Reifel Visitor Center would be rehabilitated and repurposed for portions of the park's headquarters and administrative functions. While the land use in this development cluster would change, the overall distribution of land uses in the Cedar Pass area would remain unchanged. Therefore, the impacts on the cultural landscape would be the same as those described for alternative 2.
- The addition of a new administrative building in the operational support area would result in the same impacts described for alternative 3.
- The Cedar Pass Lodge, including all later additions and the basement would be demolished, and a new main lodge would be constructed in the same location but with a slightly larger footprint. Because this alternative would demolish the 1938 core of the lodge structure, it would not adhere to the rehabilitation treatment described in the cultural landscape report, and therefore would result in a direct, long-term, adverse impact on the cultural landscape.

### **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as described for alternative 2, resulting in direct, long-term, beneficial impacts. The beneficial and adverse impacts from alternative 4, when considered together with other past, present, and reasonably foreseeable actions would result in overall direct, long-term, beneficial impacts on the cultural landscape. Alternative 2 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects to the cultural landscape in the Cedar Pass area.

### **Conclusion**

Beneficial impacts on the cultural landscape would be the same as those described under alternative 2. However, alternative 4 would also result in direct, long-term, adverse impacts from the demolition of the historic Cedar Pass Lodge. Alternative 2 would contribute appreciable direct, long-term, beneficial impacts on the overall cumulative effects to the cultural landscape in the Cedar Pass area.

## **HISTORIC STRUCTURES**

### **METHODOLOGY AND ASSUMPTIONS**

Historic structures in the Cedar Pass Area would be affected by proposed repairs, upgrades, additions, and demolitions of extant historic structures proposed under the range of alternatives. Proposed changes to historic structures, other than demolition, would avoid adverse impacts by adhering to the rehabilitation treatment in the *Cedar Pass Developed Area Badlands National Park Cultural Landscape Report* (John Milner Associates 2005). The proposed changes under each alternative would comply with the Secretary of the Interior's *Standards for the Treatment of Historic Properties, Guidelines for the Treatment of Cultural Landscapes*; Director's Order 28: *Cultural Resource Management Guidelines* (NPS 1998); and all applicable local, state, and federal codes, regulations, and policies. Changes to historic structures that adhere to the rehabilitation standards would result in direct, long-term, beneficial impacts because they would allow for the repair and renovation of historic fabric and the continued use and preservation of the historic structure. Direct, long-term, adverse impacts would result from the demolition of historic structures that could be otherwise rehabilitated and from alterations to historic structures that are inconsistent with the historic context of the Cedar Pass area. No indirect or short-term impacts are anticipated.

### **ALTERNATIVE 1: NO ACTION**

#### **Analysis**

Under alternative 1, there would be no physical changes to any historic structures, including the Ben Reifel Visitor Center, Cedar Pass Lodge, park staff residences, and other contributing structures. Therefore, alternative 1 would not have any impact on historic structures.

#### **Cumulative Impacts**

Alternative 1 would not contribute any impacts on the overall cumulative effects on historic structures; therefore, there would be no cumulative impacts.

#### **Conclusion**

Under alternative 1, there would be no new impacts on historic structures. Alternative 1 would not contribute any impacts on the overall cumulative effects on historic structures. The visitor center and the Cedar Pass Lodge would continue to degrade because of lack of repairs and upgrades to meet increased visitation.

### **ALTERNATIVE 2: PRESERVE AND RESTORE MISSION 66 AT CEDAR PASS**

#### **Analysis**

Proposed development under alternative 2 would preserve and restore Cedar Pass's Mission 66 features. The Ben Reifel Visitor Center would be rehabilitated and expanded. This alternative would restore the building's character-defining features and remove incompatible recent changes to its northern façade. The expansion would include an addition on its south side. The three non-historic and temporary administrative buildings would be replaced with historically compatible new construction in the same general location, and the adjacent parking lot would be redesigned to improve functionality and improve visual conditions within this development cluster. Alternative 2 would result in long-term, beneficial impacts.

Similarly, the proposed changes within the Cedar Pass Lodge development cluster under alternative 2 would emphasize the rehabilitation of the existing structures. The 1938 lodge would be rehabilitated, and all later additions would be demolished, in accordance with the rehabilitation treatment described in the cultural landscape report. The restoration of this building and construction of a new, historically compatible lodge check-in building would accommodate the program for the Cedar Pass Lodge outlined in chapter 2. The historic outbuildings associated with the lodge, including the icehouse, laundry building, maintenance building, and lodge cottage would also be rehabilitated and improved. The proposed development within the Cedar Pass Lodge development cluster would result in direct, long-term, beneficial impacts because the rehabilitation of these historic structures would occur in accordance with the rehabilitation treatment described in the cultural landscape report.

Under alternative 2, employee housing units accommodated in the Cedar Pass area would be located within the historic housing development cluster. The historic superintendent's house (building number 12) and garage would be restored and repurposed to their original function. All six contributing single-family homes and garages and three historic apartment buildings would be rehabilitated in accordance with the rehabilitation treatment described in the cultural landscape report, while the single-family house #34 and garage, which contribute to the national register historic district, would be rehabilitated as a community building. Two non-contributing buildings would be demolished and replaced with new historically compatible facilities. All new housing would be compatible with the historic landscape and character of adjacent historic buildings. These changes to existing employee housing buildings would result in direct, long-term, beneficial impacts because changes would adhere to the rehabilitation treatment described in the cultural landscape report, and building 12 would return to its historical use.

Lastly, under alternative 2, the three comfort stations that are contributing structures to the historic district within the campground would be maintained and improved. This change would result in direct, long-term, beneficial impacts because the improvements would adhere to the rehabilitation treatment's standards for buildings described in the cultural landscape report.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable actions in the Cedar Pass area are not anticipated to have any impact on historic structures. The impacts from alternative 2, when considered together with other past, present, and reasonably foreseeable actions would result in direct, long-term beneficial impacts. Alternative 2 would contribute all direct, long-term, beneficial impacts on the overall cumulative effects to historic structures in the Cedar Pass area.

### **Conclusion**

Under alternative 2, the redevelopment of the Cedar Pass area would focus on rehabilitating existing structures, consistent with Mission 66, with limited new construction. All proposed alterations to historic structures, including the Ben Reifel Visitor Center, Cedar Pass Lodge, and historic housing units would adhere to the rehabilitation treatment described in the cultural landscape report as well as Secretary of the Interior's *Standards for the Treatment of Historic Properties*, which would result in direct, long-term, beneficial impacts. Alternative 2 would contribute appreciable direct, beneficial impacts on the overall cumulative effects to historic structures.

## **ALTERNATIVE 3: MINIMIZE BUILDING FOOTPRINT**

### **Analysis**

Under alternative 3, the Ben Reifel Visitor Center and the three non-historic and temporary administrative buildings would be demolished, and a new consolidated headquarters and visitor center building would be

constructed to the north of the current visitor center. The Ben Reifel Visitor Center is both a contributing structure to the national register-eligible historic district and eligible for the national register in its own right. The design, construction, and style of the structure embodies the Mission 66-initiative and “Park Service Modern” style, and the demolition of the building when not in critical disrepair would not adhere to the rehabilitation standards, resulting in a direct, long-term, adverse impact on this historic structure.

The redevelopment of the Cedar Pass Lodge under alternative 3 would rehabilitate the 1938 lodge and demolish all later additions. To accommodate the Cedar Pass Lodge program within the 1938 footprint, the building would include in a two-story addition containing administrative space, retail storage, and the employee dining room. The two-story addition would alter a contributing structure to the historic district in a manner inconsistent with the historic context of Cedar Pass. While the 1938 core of the lodge does have a low cross-gable that rises higher than surrounding structures, the construction of a full two-story addition would conflict with the characteristic one-story massing style and scale of the Cedar Pass area built environment and would therefore constitute a direct, long-term, adverse impact. The impacts on the icehouse, laundry building, maintenance building, and lodge cottage would be the same as those described for alternative 2.

The impacts to historic structures in the housing development cluster and at the campground are the same as those described for alternative 2.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable actions in the Cedar Pass area are not anticipated to have any impact on historic structures. The impacts from alternative 3, when considered together with other past, present, and reasonably foreseeable actions would result in direct, long-term, beneficial and adverse impacts. The overall impacts under alternative 3 would be beneficial, and alternative 3 would contribute all direct, long-term, beneficial impacts on the overall cumulative effects to historic structures in the Cedar Pass area.

### **Conclusion**

Many of the proposed alterations to historic structures under alternative 3 would result in direct, long-term, beneficial impacts. However, adverse impacts would result from the demolition of the historic Ben Reifel Visitor Center and the second-story addition to the Cedar Pass Lodge, which would alter a historic structure in a manner inconsistent with the historic context of Cedar Pass. Alternative 3 would contribute appreciable beneficial and adverse direct impacts on the overall cumulative effects to historic structures.

## **ALTERNATIVE 4: REDEFINE THE EXPERIENCE AT CEDAR PASS**

### **Analysis**

Under alternative 4, the existing Ben Reifel visitor center would be renovated and rehabilitated in accordance with the rehabilitation treatment described in the cultural landscape report. The rehabilitation would restore the building’s character-defining features and remove incompatible recent changes to its northern façade. The building’s interior would be renovated to accommodate a portion of the park’s administration program. These changes would result in direct, long-term, beneficial impacts. Retaining the current visitor center as administrative space would preserve a contributing building within the Cedar Pass Historic District and allow the park the opportunity to rehabilitate its façade.

Under alternative 4, the Cedar Pass Lodge, including all later additions and the basement would be demolished, and a new main lodge would be constructed in the same location but with a slightly larger footprint. Because this alternative would demolish the 1938 core of the lodge structure, it would not

adhere to the rehabilitation treatment, and therefore would result in a direct, long-term, adverse impact on a historic structure.

The impacts on historic structures in the housing development cluster and at the campground would be the same as those described for alternative 2.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable actions in the Cedar Pass area are not anticipated to have any impacts on historic structures. The impacts from alternative 4, when considered together with other past, present, and reasonably foreseeable actions would result in direct, long-term, beneficial and adverse impacts. The overall impacts under alternative 4 would be beneficial, and alternative 4 would contribute all beneficial, long-term, and direct impacts on the overall cumulative effects to historic structures in the Cedar Pass area

### **Conclusion**

Most of the proposed alterations to historic structures, including the Ben Reifel Visitor Center and historic housing units would result in direct, long-term, beneficial impacts. Demolition of the Cedar Pass Lodge and its replacement with compatible new construction would result in direct, long-term, adverse impacts. Alternative 4 would contribute all beneficial, long-term, and direct impacts on the overall cumulative effects to historic structures in the Cedar Pass area.

## **PALEONTOLOGICAL RESOURCES**

### **METHODOLOGY AND ASSUMPTIONS**

The surface of the study area is composed mostly of Quaternary Alluvium within which fossils are not abundant (Benton, NPS, pers. comm. 2018d). The fossil-rich Brule Formation underlies the Quaternary Alluvium and is exposed on the surface in parts of the study area. Potential direct impacts on paleontological resources are associated primarily with disturbance of the Brule Formation. Disturbance of fossil beds within the Brule Formation to accommodate proposed development would result in long-term, adverse impacts; once fossil beds are disturbed or eroded, they are typically lost unless a trained paleontologist preserves or properly excavates them prior to disturbance.

Disturbance to paleontological resources would occur in the following ways:

- **Expanded footprint of Cedar Pass facilities and infrastructure:** Expansion of the development footprint would require excavation to accommodate new or modified building foundations and slabs, utility trenches, and roadbeds. Adverse impacts resulting from the disturbance of fossiliferous Brule Formation outcrops and buttes would be avoided under all alternatives because the development footprint excludes these resources. However, excavation in the Brule Formation underlying the Quaternary Alluvium would likely occur under the action alternatives and would affect paleontological resources.
- **Drainage patterns:** Future development within the Cedar Pass area would modify the existing drainage patterns. Changes could result from increases in sheet flows from new impervious surfaces and the implementation of stormwater management practices and infrastructure to control these flows. Altered runoff patterns could change the geometry of existing drainage channels and result in the formation of new channels. These changes could erode the previously undisturbed Brule Formation below the alluvium, resulting in indirect, adverse impacts on paleontological resources.

## **ALTERNATIVE 1: NO ACTION**

### **Analysis**

Under the no-action alternative, there would be no new impacts on paleontological resources. Continued operation and maintenance of facilities and infrastructure in the Cedar Pass area would not disturb the underlying Brule Formation and would not alter drainage patterns. Erosion in areas with existing drainage issues could expose the previously undisturbed Brule Formation. Paleontological resources would continue to be managed in accordance with the park's paleontological resource management policies.

### **Cumulative Impacts**

Alternative 1 would not contribute any impacts on the overall cumulative effects on paleontological resources; therefore, there would be no cumulative impacts.

### **Conclusion**

Under alternative 1, there would be no new impacts on paleontological resources. Alternative 1 would not contribute any impacts on the overall cumulative effects to paleontological resources. The park would continue to manage paleontological resources in accordance with its paleontological resource management policies.

## **ALTERNATIVE 2: PRESERVE AND RESTORE MISSION 66 AT CEDAR PASS**

### **Analysis**

While some of the proposed development under alternative 2 would not require the excavation of more than 2 to 3 feet of alluvium, other development activities would require deeper excavation of the underlying fossil-rich Brule Formation, particularly for the construction of new facilities. The renovation and/or expansion of the Ben Reifel Visitor Center; visitor, RV and bus parking along Ben Reifel Road and south of the visitor center; Cedar Pass Lodge; amphitheater, and interpretive shelter at the amphitheater would require excavation of up to approximately 1.3 acres of the underlying Brule Formation. There would be a smaller chance of impacts in these locations due to previous disturbance of the underlying Brule Formation to construct existing facilities and infrastructure. Small areas along the periphery of the expanded and improved facilities would require new excavation of the Brule Formation to accommodate additional square footage and to ensure proper drainage and structural integrity.

The construction of new facilities would require excavation of up to approximately 2.9 acres of the underlying Brule Formation across a greater area and in locations where previous disturbance has been more limited. These facilities include:

- a new approximately 15,890-SF headquarters building;
- a new laundry building serving the Cedar Pass Lodge;
- 6 new visitor cabin units at the Cedar Pass Lodge;
- 5 new camper cabins at the campground;
- a new dump station;
- 6 new staff housing facilities; and
- the new interpretive trail to the north of the Badlands Loop Road.

All of the facilities proposed under alternative 2 would be located at a sufficient distance from adjacent buttes to avoid destabilization and erosion of the aboveground portions of these formations. The structure closest to a butte would be the expanded amphitheater; appropriate stormwater management strategies would be implemented at the base of the butte to avoid indirect adverse impacts to the nearby paleontological resources caused by erosion.

Ground disturbance required for other proposed development under alternative 2, including improvements and expansions of outdoor program and gathering areas, roads, parking areas, sidewalks, and multiuse trails would likely only affect the alluvium, thereby avoiding impacts on paleontological resources. The construction of nine new RV pads south of the operational support area would require the addition of fill to elevate the pads above historical flood elevations; therefore, the potential impact on fossil resources is low.

New and modified buildings, parking areas, and other facilities under alternative 2 would result in an approximately 3-acre increase in the total impervious surface area. Under alternative 2, all proposed development would occur within the area zoned for development in the park's 2006 general management plan. The potential for indirect adverse impacts from the additional stormwater runoff and the resulting changes to drainage channels would be avoided and minimized through the implementation of appropriate stormwater best management practices mitigation measures.

### **Cumulative Impacts**

Past actions in Cedar Pass have affected paleontological resources in Cedar Pass. The past Badlands Loop Road rehabilitation required excavation of the underlying Brule Formation and changed drainage patterns, disturbing paleontological resources and causing erosion that may have uncovered previously buried fossils, resulting in long-term, adverse impacts. Present and reasonably foreseeable actions would have a minimal impact on these resources for additional development anticipated in the Cedar Pass area. While the loop road engineering study would result in changes that could affect paleontological resources along the sides of the existing roadway, previous disturbance of this area, particularly along the south side of Badlands Loop Road, limits the potential occurrence of these resources. The impacts from alternative 2, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, adverse impacts. Alternative 2 would contribute appreciable direct and indirect, adverse impacts on the overall cumulative effects to paleontological resources in the Cedar Pass area.

### **Conclusion**

Direct, long-term, adverse impacts on paleontological resources would occur primarily as a result of the excavation of small areas along the periphery of the facilities proposed for renovation and expansion. The construction of a new headquarters building, laundry building, visitor cabins, camper cabins, housing facilities and a new dump station would require excavation of the underlying Brule Formation across a greater area and in locations where previous disturbance is more limited. Indirect, long-term, adverse impacts resulting from the addition of 3 acres of impervious surface and the subsequent changes to the erosional environment of the Cedar Pass would occur. These impacts would be avoided, minimized, and mitigated by adhering to the park's paleontological resource management program and the implementation of stormwater best management practices. Additional mitigation measures are described in chapter 2. Alternative 2 would contribute appreciable direct and indirect, adverse impacts on the overall cumulative effects on paleontological resources.

### **ALTERNATIVE 3: MINIMIZE BUILDING FOOTPRINT**

#### **Analysis**

Under alternative 3, all proposed development would occur within the area zoned for development in the park's 2006 general management plan. While some of the proposed development under alternative 3 would not require the excavation of more than 2 to 3 feet of alluvium, many development activities would require the excavation of the underlying fossil-rich Brule Formation, particularly for the construction of new facilities. The expansion of visitor, RV, and bus parking along Ben Reifel Road and south of the consolidated visitor center and headquarters building; the Cedar Pass Lodge; amphitheater; and amphitheater parking lot would require excavation of approximately 1.7 acres of the underlying Brule Formation adjacent to areas where the substrate has been previously quarried to accommodate development. The potential for impacts on the underlying Brule Formation would be smaller because of previous disturbance to construct existing facilities and infrastructure. However, small areas along the periphery of the expanded and improved facilities would require new excavation of the Brule Formation to accommodate additional square footage and to ensure proper drainage and structural integrity.

The construction of new facilities would require excavation of up to 1.5 acres of the underlying Brule Formation across a greater area and in locations where previous disturbance has been more limited. These facilities include:

- a new approximately 24,700-SF consolidated visitor center and headquarters building ;
- a new approximately 5,500-SF ranger station and bioscience building in the operational support area;
- a new laundry building serving the Cedar Pass Lodge;
- eight new visitor cabin units at the Cedar Pass Lodge;
- five new camper cabins at the campground;
- a new dump station;
- six new staff housing facilities; and
- the new interpretive trail to the north of the Badlands Loop Road.

While the improvements to the Cedar Pass Lodge would generally occur within the existing footprint, excavation of substrate surrounding the existing foundation would be required to remedy moisture intrusion and structural deficiencies of the existing structure.

Similar to alternative 2, all of the facilities proposed under alternative 3 would be located at a sufficient distance from adjacent buttes to avoid destabilization and erosion of the aboveground portions of these formations. Ground disturbance and fill affecting only the alluvium, including the construction of nine new RV pads, would be the same as described for alternative 2.

New and modified buildings, parking areas, and other facilities under alternative 3 would result in an approximately 5-acre increase in the total impervious surface area. Under alternative 3, all proposed development would occur within the area zoned for development in the park's 2006 general management plan. The potential for indirect, adverse impacts from additional stormwater runoff and the resulting changes to drainage channels would be avoided and minimized through the implementation of appropriate stormwater best management practices mitigation measures.

## **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternative 2. The impacts from alternative 3, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, adverse impacts. Alternative 3 would contribute appreciable direct and indirect, adverse impacts on the overall cumulative effects on paleontological resources.

## **Conclusion**

Similar to alternative 2, direct, long-term, adverse impacts on paleontological resources would occur as a result of the excavation required for the renovation and new construction of facilities and infrastructure proposed under alternative 3. The construction of a new consolidated visitor center and headquarters building, new ranger station and bioscience building, laundry building, visitor cabins, camper cabins, housing facilities, dump station, and interpretive trail on the north side of Badlands Loop Road would require excavation of the underlying Brule Formation across a greater area and in locations where previous disturbance is more limited. These impacts would be avoided, minimized, and mitigated as described in chapter 2. Indirect, long-term, adverse impacts resulting from the addition of 5 acres of impervious surface and the subsequent changes to the erosional environment of the Cedar Pass would occur. Adverse impacts would be minimized and mitigated by adhering to the park's paleontological resource management program and the implementation of stormwater best management practices. Alternative 3 would contribute appreciable direct and indirect, adverse impacts on the overall cumulative effects to paleontological resources.

## **ALTERNATIVE 4: REDEFINE THE EXPERIENCE AT CEDAR PASS**

### **Analysis**

Under alternative 4, all proposed development would occur within the area zoned for development in the park's 2006 general management plan. While some of the proposed development under alternative 4 would not require the excavation of more than 2 to 3 feet of alluvium, other development activities would require deeper excavation of the underlying fossil-rich Brule Formation, particularly for the construction of new facilities.

The expansion of RV and bus parking along Ben Reifel Road, the renovation of the Ben Reifel Visitor Center to accommodate the headquarters building, Cedar Pass Lodge, and amphitheater would require excavation of approximately 0.5 acre of the underlying Brule Formation adjacent to areas where the substrate has been previously quarried to accommodate development. The potential for impacts on the underlying Brule Formation in these locations would be small because of the previous disturbance to construct existing facilities and infrastructure. However, small areas along the periphery of the expanded facilities would require new excavation of the Brule Formation.

The construction of new facilities would require excavation of up to 2.7 acres of the underlying Brule Formation across a greater area and in locations where previous disturbance has been more limited. These facilities include:

- a new approximately 15,000-SF visitor center and parking lot between the current visitor center and the Cedar Pass Lodge;
- a new approximately 5,500-SF ranger station in the operational support area;
- a new lodge check-in building on the east side of the Cedar Pass Lodge and icehouse;
- a new laundry building serving the Cedar Pass Lodge;

- 15 new visitor cabin units at the Cedar Pass Lodge;
- 5 new camper cabins at the campground;
- a new dump station;
- 6 new staff housing facilities; and
- the new interpretive trail to the north of the Badlands Loop Road.

The largest area previously undisturbed area is the area for the new visitor center and associated parking area and the outdoor program area. These new facilities would require approximately 2 acres of construction to accommodate the new building foundation, utility infrastructure, and parking lot. The alluvium in this area is on average 2 to 3 feet thick. Grading and construction of foundations to ensure proper drainage and structural integrity would likely require some shallow excavation of Brule Formation deposits.

Compared to alternatives 1, 2, and 3, alternative 4 would have a larger effect on the Brule Formation. However, because the new buildings would not have basements, depths of excavation would be shallow, which would limit the total volume of excavated Brule Formation deposits, thereby limiting impacts on paleontological resources. During construction, paleontologists would monitor and survey the rock surface of undisturbed Brule Formation that would be affected by new or expanded facility. Identified fossils would be carefully salvaged and curated into the park's museum collection.

Similar to alternatives 2 and 3, all of the facilities proposed under alternative 4 would be located at a sufficient distance from adjacent buttes to avoid destabilization and erosion of the aboveground portions of these formations.

New and modified buildings, parking areas, and other facilities under alternative 4 would result in an approximately 5-acre increase in the total impervious surface area, compared to existing conditions (alternative 1). Compared to alternatives 1, 2, and 3, alternative 4 would expand the development footprint the most and would add the largest area of impervious surfaces. Runoff from the new visitor center and parking lot would increase stormwater flows to the adjacent drainage channel, which may enlarge the main drainage channel in the project area, potentially eroding the underlying Brule Formation. This indirect impact would be partially offset by the reduction in impervious surfaces on the east side of Ben Reifel Road, including a reduction in parking pavement and the demolition of the existing administrative buildings. These spaces would become restored floodplain and open space, which would allow for partial infiltration of stormwater into the ground. The potential for indirect, adverse impacts from the additional stormwater runoff and the resulting changes to drainage channels would be avoided or minimized through the implementation of appropriate stormwater best management practices.

### **Cumulative Impacts**

The contribution of past, present, and reasonably foreseeable actions to the overall cumulative effects would be the same as those described for alternatives 2 and 3. The impacts from alternative 4, when considered together with other past, present, and reasonably foreseeable actions would result in direct and indirect, long-term, adverse impacts. Alternative 4 would contribute a greater increment of appreciable direct and indirect, adverse impacts on the overall cumulative effects to paleontological resources than alternatives 2 and 3.

### **Conclusion**

Direct, long-term, adverse impacts on paleontological resources would occur primarily because of construction of new facilities. The construction of a new visitor center and parking lot, laundry building, visitor cabins, camper cabins, staff housing facilities, ranger station, dump station, and interpretive trail

would require some excavation of the underlying Brule Formation in locations that were previously not developed. Excavation of Brule Formation deposits would require monitoring and surveying during construction, and identified fossils would be salvaged to avoid, minimize, and mitigate impacts, as described in chapter 2. Indirect, long-term, adverse impacts resulting from the addition of approximately 5 acres of impervious surface and the subsequent changes to the erosional environment of the Cedar Pass would occur. Adverse impacts would be minimized and mitigated by adhering to the park's paleontological resource management program and the implementation of stormwater best management practices. Alternative 4 would contribute a greater increment of direct and indirect, adverse impacts on the overall cumulative effects to paleontological resources than alternatives 2 and 3.

## **CHAPTER 5: CONSULTATION AND COORDINATION**

This “Consultation and Coordination” chapter describes the public involvement and agency consultation used during the preparation of the development concept plan / environmental assessment. A combination of activities, including internal scoping, helped guide the National Park Service in developing this document. This chapter provides a detailed list of the various consultations initiated during the development of the development concept plan / environmental assessment, as well as a list of recipients for this document.

### **PLANNING AND PUBLIC INVOLVEMENT**

#### **INTERNAL SCOPING**

The internal scoping process for the project began on June 22, 2017, when representatives from the park, Minuteman Missile National Historic Site, NPS Midwest Region, NPS Denver Service Center, and the consultant teams for the historic structures report and development concept plan / environmental assessment met to discuss the proposed redevelopment of the Cedar Pass area, specifically the vision for future concession operations and the desired visitor experience for Cedar Pass. During this meeting, the project team toured the project area, documenting existing conditions, and revised the scope of work for the development concept plan. Internal scoping continued on October 4, 2017, when representatives from the park, NPS Midwest Region, NPS Denver Service Center, and their consultants met to discuss the purpose and need of the project and resource conditions and issues within the project area. On November 1 and 2, 2017, the group conducted a findings workshop to discuss initial architectural, structural, utilities, geotechnical, environmental, and civil findings and to coordinate findings to date between multiple planning processing occurring at the park simultaneously. An alternatives meeting was conducted on February 7 and 8, 2018, to discuss and develop alternatives for the development concept plan / environmental assessment and to plan for public outreach. Throughout the development of this development concept plan / environmental assessment, the group coordinated regularly to review relevant issues, discuss the development of alternatives and impact analysis, and further develop means of including agencies and the public in the planning process.

#### **PUBLIC INVOLVEMENT**

The development concept plan / environmental assessment will be on formal public and agency review for 30 days. Interested individuals, agencies, and organizations will be notified of its availability. The development concept plan / environmental assessment will be available for public review on the NPS Planning, Environment, and Public Comment website <http://parkplanning.nps.gov/badl>, and hard copies will be available at the Ben Reifel Visitor Center.

#### **AGENCY CONSULTATION**

Consultation with relevant agencies occurred during preparation of the development concept plan / environmental assessment. All agencies will be provided a copy of the development concept plan / environmental assessment for review. This consultation is discussed in more detail below. Copies of correspondence between the National Park Service and the agencies, and responses from the agencies, if applicable, will be provided in the decision document.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the impacts of their undertakings on historic properties. This development concept plan / environmental assessment evaluates impacts on cultural resources according to NPS *Management Policies 2006*. Compliance with section 106 of the National Historic Preservation Act was carried out separately but concurrently with the planning process.

In May 2018, the South Dakota state historic preservation office and the National Park Service conducted a meeting at the park headquarters to discuss multiple projects including the Cedar Pass development concept plan. The state historic preservation office provided input regarding actions that could ensure long-term preservation of cultural resources, as well as actions that would lessen potential adverse effects on cultural resources. Based on the development proposed under the preferred alternative (alternative 4), the effect on cultural resources is likely to be adverse.

The park will provide the South Dakota state historic preservation office with a review copy of the development concept plan / environmental assessment to assist it in evaluating the potential effects of the proposed alternatives on cultural resources. In accordance with the provisions of section 106 of the National Historic Preservation Act, the National Park Service will continue to consult with the South Dakota state historic preservation office and associated American Indian tribes.

## **CHAPTER 6: LIST OF PREPARERS**

### **US DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE**

#### **BADLANDS NATIONAL PARK**

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## CHAPTER 7: ACRONYMS AND ABBREVIATIONS

<b>ABA</b>	Architectural Barriers Act
<b>ABAAS</b>	Architectural Barriers Act Accessibility Standards
<b>BNHA</b>	Badlands Natural History Association
<b>BP</b>	before present
<b>CCC</b>	Civilian Conservation Corps
<b>Cedar Pass area</b>	Cedar Pass Developed Area
<b>CEQ</b>	Council on Environmental Quality
<b>CFR</b>	Code of Federal Regulations
<b>DCP</b>	development concept plan
<b>EA</b>	environmental assessment
<b>GIS</b>	geographic information system
<b>MMNHS</b>	Minuteman Missile National Historic Site
<b>mph</b>	miles per hour
<b>national register</b>	National Register of Historic Places
<b>NEPA</b>	National Environmental Policy Act of 1969, as amended
<b>NPS</b>	National Park Service
<b>park</b>	Badlands National Park
<b>RV</b>	recreational vehicle
<b>SF</b>	square feet
<b>USC</b>	United States Code

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## CHAPTER 8: REFERENCES

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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 wise use of our land and water resources, protecting our fish and wildlife, 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. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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