

Consultation and Coordination

PUBLIC AND AGENCY INVOLVEMENT

This *Draft General Management Plan / Environmental Impact Statement* for Badlands National Park represents thoughts presented by the National Park Service, other agencies, American Indian tribes, and the public. Consultation and coordination among the tribes, agencies, and the public were vitally important throughout the planning process. The public had two primary avenues by which it participated during the development of the plan: participation in public meetings and responses to newsletters.

PUBLIC MEETINGS AND NEWSLETTERS

Public meetings and newsletters were used to keep the public informed and involved in the planning process for the park. A mailing list that was compiled consisted of American Indian tribes, governmental agencies, nongovernmental organizations, business, legislators, local governments, and interested citizens.

A notice of intent to prepare an environmental impact statement was published in the *Federal Register* on July 20, 2000. A newsletter issued in September 2000 described the planning effort. A total of 30 comments were received in response to that first newsletter.

The National Park Service conducted public meetings in Rapid City, Kyle, Wall, and Sioux Falls in October 2000. A total of 16 people attended those meetings.

A second newsletter distributed in February 2001 described the issues that would be addressed in the plan and presented preliminary management zones to be used in developing the alternatives. Six written

comments were received in response to the second newsletter.

A third newsletter distributed in November 2001 described the draft alternatives for managing the park and identified the National Park Service's preferred alternative. In November the National Park Service hosted public meetings in Rapid City, Wall, Pine Ridge, Manderson, and Kyle. Those meetings were attended by 35 people. A total of 33 written comments were received in response to the third newsletter and the public meetings.

After this *Draft General Management Plan / Environmental Impact Statement* is distributed, there will be more public meetings to give the public an opportunity to discuss the alternatives and provide comments and suggestions.

CONSULTATION WITH STATE HISTORIC PRESERVATION OFFICER

According to section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 270, et seq.), agencies that have direct or indirect jurisdiction over historic properties are required to take into account the effect of any undertaking on properties eligible for the National Register of Historic Places. To meet the requirements of 36 CFR 800, the National Park Service sent letters to the South Dakota historic preservation office and the Advisory Council on Historic Preservation on May 15, 2000, inviting their participation in the planning process. Both offices were sent all the newsletters, with a request for their comments.

Stipulation VI.E. of the 1995 programmatic agreement among the National Park Service, the Advisory Council on Historic

Preservation, and the National Conference of State Historic Preservation Officers requires that the National Park Service, in consultation with the state historic preservation officer, who will make a determination about which are programmatic exclusions under IV.A and B, and all other undertakings, potential effects on those resources to seek review and comment

under 36 CFR 800.4-6 during the plan review process.

The specific undertakings are listed in table 17, along with the National Park Service's determination of how those individual undertakings relate to the 1995 programmatic agreement.

TABLE 17: SELECTED ACTIONS IN THE PREFERRED ALTERNATIVE THAT COULD AFFECT CULTURAL RESOURCES — WITH ASSOCIATED COMPLIANCE REQUIREMENTS

<i>[Requirements of the Historic Preservation Office and/or the Advisory Council on Historic Preservation]</i>	
Action	Compliance Requirement
Construct visitor contact station near Pinnacles	Further SHPO review necessary at design stage of project
Develop education pavilion and group campsite at bison handling facilities	Further SHPO review necessary at design stage of project
Develop wilderness orientation facility and campground in the expansion along SD 44 (if acquired)	Further SHPO review necessary to facilitate use of the property for these purposes
Make detailed plans for the Prairie Homestead (if acquired)	Further consultation with SHPO necessary
Establishment of trailheads and picnic areas	Further SHPO review necessary at design stage of project

CONSULTATION WITH AMERICAN INDIAN GROUPS

The National Park Service sent letters to the following American Indian groups on January 23, 2002, to invite them to participate in the planning process:

Cheyenne River Sioux Tribe
 Crow Creek Sioux Tribe
 Flandreau Santee Sioux
 Lower Brule Sioux Tribe
 Oglala Sioux Tribe
 Omaha Tribe
 Rosebud Sioux Tribe
 Ponca Tribe
 Santee Sioux Tribe
 Sisseton-Wahpeton Sioux
 Spirit Lake Nation
 Standing Rock Nation
 Three Affiliated Tribes
 Trenton Indian Service
 Turtle Mountain

Winnebago Tribe
 Yankton Sioux Tribe

In addition, the National Park Service presented the preliminary alternatives to the tribal council of the Oglala Sioux Tribe on January 22, 2002. The presentation included an overview of the alternatives, a description of the next steps that would be taken in the planning process, a summary of the public comments, and an opportunity for questions and discussion. The tribe was particularly interested in efforts to increase visitation to the South Unit, opportunities for economic development on the reservation near the South Unit, and protection of sacred sites in the park. Park staff met with various committees and tribal offices to brief them on the planning effort. In addition, the tribes will have an opportunity to review and comment on this draft plan.

CONSULTATION WITH THE U.S. FISH AND WILDLIFE SERVICE

The Endangered Species Act of 1973, as amended, requires in section 7 (a) (2) that each federal agency, in consultation with the secretary of the interior, ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. This section of the act sets out the consultation process, which is further implemented by regulation (50 CFR 402).

The National Park Service initiated informal consultation with the U.S. Fish and Wildlife Service in September 2000 to determine the presence of federally listed threatened and endangered species in Badlands National Park. To remain up to date about listed and proposed threatened and endangered species, the National Park Service has consulted the USFWS Web site. Copies of the three newsletters also were provided for the U.S. Fish and Wildlife Service, and the agency will be given a copy of this draft document for review. This GMP/EIS serves as a biological assessment, and the USFWS will be asked to determine if the agency concurs with the NPS findings.

AGENCIES AND ORGANIZATIONS TO WHICH THIS DOCUMENT WAS SENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation
U.S. Department of Agriculture
 Forest Service
 Natural Resource Conservation
 Service
U.S. Department of the Interior
 Bureau of Indian Affairs
 U.S. Fish and Wildlife Service
 U.S. Geological Survey
U.S. Environmental Protection Agency

State-elected Federal Officials

Senator John Thune
Senator Tim Johnson
Representative Stephanie Herseth

American Indian Tribes

Cheyenne River Sioux Tribe
Crow Creek Sioux Tribe
Flandreau Santee Sioux Tribe
Lower Brule Sioux Tribe
Oglala Sioux Tribe
Omaha Tribe
Rosebud Sioux Tribe
Ponca Tribe
Santee Sioux Tribe
Sisseton-Wahpeton Sioux Tribe
Spirit Lake Nation
Standing Rock Nation
Three Affiliated Tribes
Trenton Indian Service
Turtle Mountain Tribe
Winnebago Tribe
Yankton Sioux Tribe

Elected State Officials

Mike Rounds, Governor of South Dakota

State of South Dakota Agencies

Department of Agriculture

Department of Environment and Natural
Resources

Department of Game, Fish and Parks

Department of Transportation

State Historic Preservation Office

Local Governments

Jackson County

Pennington County

Shannon County

Mayor of Wall

Mayor of Interior

Organizations and Businesses

A&M Cafe

Badlands Petrified Gardens

Corn Palace

Devils Tower National Monument

Fossil Butte National Monument

Handicapped Travel Club

Jewel Cave National Monument

Kadoka Depot Museum

Keystone Area Historical Society

Prairie Homestead Museum

South Dakota Stockgrowers Association

Media

Bennett County Booster

Chamberlain-Oacoma Register

Custer County Chronicle

Denver Post

Indian Country Today

Kadoka Press

KBHE News

KCLO News

KEVN News

KILI Radio

KOTA News

Midwest Living

Minneapolis Star-Tribune

Mitchell Republic

Murdo Coyote

Rocky Mountain News



**Appendixes, References, Preparers
and Index**

APPENDIX A: LEGISLATION

U.S. Code Title 16 Chapter 1

Section 441. Badlands National Park; establishment

When a quantum, satisfactory to the Secretary of the Interior, of the privately owned lands lying within the area hereinafter described shall have been acquired and transferred to the United States for park purposes, without expense to the Federal Treasury, such areas are dedicated and set apart as a national park for the benefit and enjoyment of the people, under the name of the Badlands National Park: Provided, That the State of South Dakota shall have first constructed the highways hereinafter described.

Section 441a. Boundaries

The areas to be included in said Badlands National Park are situated in the State of South Dakota and lie within the boundaries particularly described as follows: Beginning at the northeast corner section 13, township 3 south, range 18 east, Black Hills meridian; thence west one-fourth mile; thence south one mile; thence west one-fourth mile; thence south one-fourth mile; thence west one mile; thence south one-fourth mile; thence west one-fourth mile; thence north one mile; thence west one and one-fourth miles; thence north one-half mile; thence west three miles, to the northwest corner section 18, township 3 south, range 18 east, Black Hills Meridian.

Thence north one-fourth mile; thence west one-half mile; thence north one-fourth mile; thence west three-fourth mile; thence south one-fourth mile; thence west one-fourth mile; thence north one-fourth mile; thence west one-fourth mile; thence north one-fourth mile; thence west three-fourths mile; thence south one-fourth mile; thence west one-half mile; thence south one-half mile; thence west one mile; thence north one-fourth mile; thence west one-fourth mile; thence north one-fourth mile; thence west one and one-fourth miles; thence north one-fourth mile; thence west one-fourth mile; thence north three-fourths mile; thence west one and one-fourth miles; thence north one-half mile, to the northeast corner section 2, township 3 south, range 16 east, Black Hills meridian.

Thence west one-half mile; thence north one mile; thence west one-fourth mile; thence north one-half mile; thence west three-fourths mile; thence north one-half mile; thence west one-half mile; thence north two miles; thence west eight miles; thence south one-half mile; thence west one mile; thence north one-half mile, to the northeast corner section 13, township 2 south, range 14 east, Black Hills meridian.

Thence west one mile; thence south one mile; thence east one-half mile; thence south one-half mile; thence west one-half mile; thence south two and one-half miles; thence east one and one-fourth miles; thence south one mile; thence east three-fourths mile, to the northeast corner section 7, township 3 south, range 15 east, Black Hills meridian.

Thence south one-fourth mile; thence east one-fourth mile; thence south one-half mile; thence west one-fourth mile; thence south one-fourth mile; thence west one mile; thence south one and three-fourths miles; thence east one mile; thence north three-fourths mile; thence east two miles; thence north one-half mile; thence east three-fourths mile; thence north one-fourth mile; thence east one-half mile; thence north three-fourths mile; thence west one-fourth mile; thence north three-fourths mile; thence west one-fourth mile; thence north one-fourth mile; thence west one-fourth mile; thence north one-fourth mile; thence east one-fourth mile; thence north one-half mile; thence east one mile; thence south one-fourth mile; thence east one and three-fourths miles; thence north one-half mile; thence

west one-half mile; thence north one-half mile, to the northwest corner section 31, township 2 south, range 16 east, Black Hills meridian.

Thence east one-half mile; thence south one-fourth mile; thence east one mile; thence south one-fourth mile; thence east one and three-fourths miles; thence south three-fourths mile; thence east three-fourths mile; thence south three-fourths mile; thence east one-half mile; thence south one-fourth mile; thence east one-fourth mile; thence south one-fourth mile; thence east one-fourth mile; thence south one-fourth mile; thence east one-fourth mile; thence south one-fourth mile; thence east one-half mile; thence south one and one-fourth miles; thence east three-fourths mile; thence north one-half mile; thence east one-fourth mile, to the northeast corner section 19, township 3 south, range 17 east, Black Hills meridian.

Thence north one-half mile; thence east three-fourths mile; thence south two miles; thence east one and one-half miles; thence north one and one-half miles; thence east two miles; thence south one-fourth mile; thence east one-fourth mile; thence south one-fourth mile; thence east one-half mile; thence south one-fourth mile; thence east one-half mile; thence south one-fourth mile; thence east one-half mile, to the northeast corner section 30, township 3 south, range 18 east, Black Hills meridian.

Thence south three-fourths mile; thence east one-fourth mile; thence south one-fourth mile; thence east one-half mile; thence north one-fourth mile; thence east one and one-fourth miles; thence south one-fourth mile; thence east three miles, to the northeast corner of section 36, township 3 south, range 18 east, Black Hills meridian.

Thence north one mile; thence east one mile; thence north one-half mile; thence west one-fourth mile; thence north one-fourth mile; thence west one-fourth mile; thence north one and one-fourth miles; thence west one-half mile to the point of beginning.

Section 441b. Construction of highway by State of South Dakota

The establishment of said park is conditioned upon the State of South Dakota first constructing the following highway in a manner satisfactory to the Secretary of the Interior: A highway commencing at the corporation limits of the town of Interior, thence going in a northwesterly direction to and over Big Foot Pass, and through the region known as The Pinnacles; thence in a westerly direction to Sage Creek, being a total distance of about thirty miles.

Section 441c. Administration, protection, and promotion; franchises for hotel and lodge accommodations

The administration, protection, and promotion of said Badlands National Park shall be exercised under the direction of the Secretary of the Interior by the National Park Service, subject to the provisions of sections 1, 2, 3, and 4 of this title: Provided, That in advance of the fulfillment of the conditions herein the Secretary of the Interior may grant franchises for hotel and for lodge accommodations under the provisions of this section.

Section 441d. Examinations, excavations, and gathering of objects of interest within park

The Secretary of the Interior is authorized to permit examinations, excavations, and gathering of objects of interest within said park by any person or persons whom he may deem properly qualified to conduct such examinations, excavations, or gatherings, subject to such rules and regulations as he may prescribe: Provided, That the examinations, excavations, and gatherings are undertaken only for the benefit of some reputable museum, university, college, or other recognized scientific or educational

institution, with a view to increasing the knowledge of such objects and aiding the general advancement of geological and zoological science.

Section 441e. Effective date of sections 441 to 441d

Sections 441 to 441d of this title shall become effective if and when all of the above conditions shall have been fully complied with to the satisfaction of the President of the United States, who shall then issue a proclamation declaring that the conditions precedent herein required have been complied with, and said proclamation shall formally dedicate and set aside the areas herein described in accordance with the provisions of section 441 of this title.

Section 441e-1. Change in name of Badlands National Monument

The area formerly known as the “Badlands National Monument,” established by Presidential Proclamation of January 25, 1939 (53 Stat. 2521), shall henceforth be known as the “Badlands National Park.”

Section 441f. Adjustment and redefinition of boundaries

In order to establish a more appropriate boundary for the Badlands National Park and to consolidate Federal land ownership therein, the Secretary of the Interior, in his discretion, is authorized to adjust and redefine the exterior boundaries of the national park by appropriate reductions or additions of land: Provided, That the total acreage of the national park, as revised pursuant to sections 441f to 441i of this title, shall not exceed its area of approximately one hundred fifty-four thousand one hundred and nineteen acres as of May 7, 1952.

Section 441g. Orders to effectuate revision of boundaries; publication

The revision of boundaries of the national park, as authorized in section 441f of this title, shall be accomplished by the issuance, by the Secretary of the Interior, of an appropriate order, or orders, such order or orders to be effective upon publication in the *Federal Register*: Provided, That federally owned land under the administrative jurisdiction of any other department or agency of the Federal Government shall be included within the park only with the approval of the head of such department or agency.

Section 441h. Jurisdiction of mining and mineral rights; patents

Administrative jurisdiction over all Federal lands eliminated from the park, by the issuance of an order or orders of the Secretary of the Interior, is transferred to the Secretary of Agriculture for use, administration, and disposition in accordance with the provisions of title III of the Bankhead-Jones Farm Tenant Act (7 U.S.C. 1010 et seq.) and the related provisions of title IV thereof: Provided, That all of such lands formerly set apart and reserved from the public domain shall be subject to the mining and minerals-leasing laws: And provided further, That any disposition of any such lands formerly set apart and reserved from the public domain shall be evidenced by patents issued by the Secretary of the Interior.

Section 441i. Exchanges of land

In order that exchanges of land may be effectuated for the purposes of sections 441f to 441i of this title, the Secretary of the Interior is authorized, in his discretion and in accordance with the provisions of section 255 of title 40, to accept, on behalf of the United States, title to any land or interests in land within the exterior boundaries of the Badlands National Park as revised pursuant to sections 441f to

441i of this title, and, in exchange therefore, with the approval and concurrence of the Secretary of Agriculture, the Secretary of the Interior may patent lands of approximately equal value which were formerly set apart and reserved from the public domain within the Badlands Fall River soil conservation project, SD-LU-1. In effectuating such exchanges, in lieu of conveyances by the Secretary of the Interior, the Secretary of Agriculture may convey lands of approximately equal value within said project which have been acquired heretofore by the United States. All such exchanges shall, in all other respects, be considered as exchanges under the provisions of section 32c, title III, of the Bankhead-Jones Farm Tenant Act (7 U.S.C. 1011(c)) and shall otherwise be in accordance with provisions of said Act (7 U.S.C. 1000 et seq.); except that, upon acceptance of title to any lands so acquired by the United States under this section, such lands and any other lands acquired otherwise by the United States within the park boundaries shall be a part of that area. In consummating land exchanges hereunder upon an equitable basis, patents and instruments of conveyance may be issued, and property may be accepted, by the United States, subject to such reservations as may be necessary or in the public interest.

Section 441j. Revision of boundaries

In order to include lands of outstanding scenic and scientific character in the Badlands National Park, the boundaries of the park are revised as generally depicted on the map entitled “Badlands National Monument,” numbered NM-BL-7021B, dated August 1967, which is on file and available for public inspection in the offices of the National Park Service, Department of the Interior. The Secretary of the Interior may make minor adjustments in the boundaries, but the total acreage in the park may not exceed the acreage within the boundaries depicted on the map referred to herein. Lands within the boundaries of the park that are acquired by the United States shall be subject to the laws and regulations applicable to the park.

Section 441k. Acquisition of property for park

(a) Consent of State or Oglala Sioux Tribe of South Dakota; transfer from Federal agency

Subject to the provisions of subsection (b) of this section, the Secretary of the Interior may, within the boundaries of the park, acquire lands and interests in lands by donation, purchase with donated or appropriated funds, or exchange, except that any lands or interests in lands owned by the State of South Dakota, a political subdivision thereof, or the Oglala Sioux Tribe of South Dakota may be acquired only with the consent of owner. Notwithstanding any other provision of law, lands and interests in lands located within the park under the administrative jurisdiction of any other Federal agency may be transferred to the administrative jurisdiction of the Secretary without a transfer of funds.

(b) Easements

As to lands located within the boundaries of the park but outside the boundaries of the gunnery range referred to in section 441l of this title, the Secretary of the Interior may acquire only rights-of-way and scenic easements.

Section 441l. Exchange of lands; transfer from Federal agency to administrative jurisdiction of Secretary; terms and conditions of purchase

Inasmuch as (A) most of the lands added to the Badlands National Park by section 441j of this title are inside the boundaries of the Pine Ridge Sioux Indian Reservation, (B) such lands are also within a tract of land forty-three miles long and twelve and one-half miles wide which is in the north-western part of such Indian reservation and has been used by the United States Air Force as a gunnery range since the early part of World War II, (C) the tribal lands within such gunnery range were leased by the Federal

Government and the other lands within such gunnery range were purchased by the Federal Government from the individual owners (mostly Indians), (D) the Department of the Air Force has declared most of such gunnery range lands excess to its needs and such excess lands have been requested by the National Park Service under the Federal Property and Administrative Services Act of 1949 (40 U.S.C. 471 et seq.), (E) the leased tribal lands and the excess lands within the enlarged Badlands National Park are needed for the park, (F) the other excess lands in such gunnery range should be restored to the former Indian owners of such lands, and (G) the tribe is unwilling to sell its tribal lands for inclusion in the national park, but is willing to exchange them or interests therein for the excess gunnery range lands, which, insofar as the lands within the gunnery range formerly held by the tribe are concerned, should be returned to Indian ownership in any event, the Congress hereby finds that such exchange would be in the national interest and authorizes the following actions:

- (a) All Federal lands and interests in lands within the Badlands Air Force gunnery range that are outside the boundaries of the park and that heretofore or hereafter are declared excess to the needs of the Department of the Air Force shall be transferred to the administrative jurisdiction of the Secretary of the Interior without a transfer of funds.
- (b) Any former Indian or non-Indian owner of a tract of such land, whether title was held in trust or fee, may purchase such tract from the Secretary of the Interior under the following terms and conditions:
 - (1) The purchase price to a former Indian owner shall be the total amount paid by the United States to acquire such tract and all interests therein, plus interest thereon from the date of acquisition at a rate determined by the Secretary of the Treasury taking into consideration the average market yield of all outstanding marketable obligations of the United States at the time the tract was acquired by the United States, adjusted to the nearest one-eighth of 1 per centum. The purchase price to a former non-Indian owner shall be present fair market value of the tract as determined by the Secretary of the Interior.
 - (2) Not less than \$100 or 20 per centum of the purchase price, whichever is less, shall be paid at the time of purchase, and the balance shall be payable in not to exceed 20 years with interest at a rate determined by the Secretary of the Treasury taking into account the current average market yield on outstanding marketable obligations of the United States with twenty years remaining to date of maturity, adjusted to the nearest one-eighth of 1 per centum.
 - (3) Title to the tract purchased shall be held in trust for the purchaser if it was held in trust status at the time the tract was acquired by the United States; otherwise, the title to the tract purchased shall be conveyed to the purchaser subject to a mortgage and such other security instruments as the Secretary deems appropriate. If a tract purchased under this subsection is offered for resale during the following ten-year period, the tribe must be given the first right to purchase it.
 - (4) The unpaid balance of the purchase price shall be a lien against the land if the title is held in trust and against all rents, bonuses, and royalties received therefrom. In the event of default in the payment of any installment of the purchase price the Secretary may take such action to enforce the lien as he deems appropriate, including foreclosure and conveyance of the land to the Oglala Sioux Tribe.
 - (5) An application to purchase the tract must be filed with the Secretary of the Interior within one year from the date a notice is published in the *Federal Register* that the tract has been transferred to the jurisdiction of the Secretary.

(6) No application may be filed by more than five of the former owners of an interest in the tract. If more than one such application is filed for a tract the applicants must agree on not more than five of the former owners who shall make the purchase, and failing such agreement all such applications for the tract shall be rejected by the Secretary.

(7) “Former owner” means, for the purposes of subsection (b) of this section, each person from whom the United States acquired an interest in the tract, or if such person is deceased, his spouse, or if such spouse is deceased, his children.

Section 441m. Disposition of excess gunnery range lands and reservation lands; purchase; terms and conditions; life estates and use restrictions

(a) Gunnery range lands; reservation lands

All Federal lands and interests in lands within the Badlands Air Force gunnery range that are outside the boundaries of the park, and that have been declared excess to the needs of the Department of the Air Force, and that are not purchased by former owner under section 441l(b) of this title, and all lands that have been acquired by the United States under authority of title II of the National Industrial Recovery Act of June 16, 1933 (48 Stat. 200), and subsequent relief Acts, situated within the Pine Ridge Indian Reservation, administrative jurisdiction over which has heretofore been transferred by the President from the Secretary of Agriculture to the Secretary of the Interior by Executive Order Numbered 7868, dated April 15, 1938, shall be subject to the following provisions of this section.

(b) Purchases

Any former Indian owner of land that is within the Badlands Air Force gunnery range and outside the boundaries of the park and that has not been declared excess to the needs of the Department of the Air Force on August 8, 1968, may, within the period specified in section 441l(b)(5) of this title, elect (i) to purchase an available tract of land described in subsection (a) of this section of substantially the same value, or (ii) to purchase the tract formerly owned by him at such time as such tract is declared excess and transferred to the Secretary of the Interior as provided in section 441l(a) of this title.

(c) Life estates and use restrictions

Any former Indian owner of a tract of land within the boundaries of the park that was acquired by the United States for the Badlands Air Force gunnery range, and that is transferred to the Secretary of the Interior pursuant to section 441k of this title, may, within the period specified in section 441l(b)(5) of this title, elect (i) to acquire from the Secretary of the Interior a life estate in such tract at no cost, subject to restrictions on use that may be prescribed in regulations applicable to the park, or (ii) to purchase an available tract of land described in subsection (a) of this section of substantially the same value.

(d) Purchase restrictions

Purchases under subsection (b) and clause (ii) of subsection (c) of this section shall be made on the terms provided in section 441l(b) of this title.

Section 441n. Lands outside gunnery range; exchange of lands; reservation of mineral rights; grazing and mineral development rights of Indians; execution of instruments; trust title

(a) Exchange of lands; mineral and grazing rights

Title to all Federal lands and interests in land within the boundaries of the Badlands Air Force gunnery range that are outside the boundaries of the park, and that are transferred to the administrative jurisdiction of the Secretary of the Interior as provided in section 441l(a) of this title, including lands hereafter declared to be excess, and that are not selected under sections 441l(b) or 441m of this title, and title to all lands within the boundaries of the park that were acquired by the United States for the Badlands Air Force gunnery range, subject to any life estate conveyed pursuant to section 441m(c) of this title and subject to restrictions on use that may be prescribed in regulations applicable to the park, which regulations may include provisions for the protection of the black-footed ferret, may be conveyed to the Oglala Sioux Tribe in exchange (i) for the right of the United States to use all tribal land within the park for park purposes, including the right to manage fish and wildlife and other resources and to construct visitor use and administrative facilities thereon, and (ii) for title to three thousand one hundred fifteen and sixty-three one-hundredths acres of land owned by the Oglala Sioux Tribe and located in the area of the Badlands Air Force gunnery range which is not excess to the needs of the Department of the Air Force and which is encompassed in civil action numbered 859 W. D. in the United States District Court for the District of South Dakota, if such exchange is approved by the Oglala Sioux Tribal Council. The lands acquired under paragraph (ii) shall become a part of the Badlands Air Force gunnery range retained by the Department of the Air Force. The United States and the Oglala Sioux Tribe shall reserve all mineral rights in the lands so conveyed. The right of the United States to use for park purposes lands that were tribally owned prior to August 8, 1968, shall not impair the right of the Oglala Sioux Tribe to use such lands for grazing purposes and mineral development, including development for oil and gas.

(b) Execution of instruments

The Oglala Sioux Tribal Council may authorize the execution of the necessary instruments to effect the exchange on behalf of the tribe, and the Secretary may execute the necessary instruments on behalf of the United States.

(c) Trust title

After the exchange is effected the title of the Oglala Sioux Tribe to the property acquired by the exchange shall be held in trust subject to the same restrictions and authorities that apply to other lands of the tribe that are held in trust.

Section 441o. Facilities for interpretation of park and history of Sioux Nation; conveyance of reservation lands; submission of terms to Congressional committees

The Oglala Sioux Tribe may convey and the Secretary of the Interior may acquire not to exceed forty acres of tribally owned lands on the Pine Ridge Indian Reservation for the purpose of erecting thereon permanent facilities to be used to interpret the natural phenomena of the park and the history of the Sioux Nation: Provided, That no such conveyance shall be made until sixty days after the terms thereof have been submitted to the Interior and Insular Affairs Committees of the House of Representatives and the Senate.

APPENDIX B: STUDY OF PROPOSED SHUTTLE SYSTEM

Castle Trail Complex

Demonstration Transportation System Plan

Badlands National Park

May 2003

Badlands National Park

South Dakota

United States Department of the Interior

National Park Service – Denver Service Center

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1.0 INTRODUCTION

1.1 Badlands National Park

Located south of Interstate 90 in southwestern South Dakota, the 244,000-acre Badlands National Park showcases eroded rocks formations – buttes, pinnacles and spires – along with native, mixed-grass prairie. In addition, the park offers visitors opportunities to hike, bicycle, camp, photograph nature, and observe wildlife. The park annually hosts an average of 1.2 million visitors, seventy-percent of which visit between June and August. The next highest visitation months, or shoulder season months, occur in September, October and May. Figure 1 shows the park and its relation to Interstate 90 and southwestern South Dakota.

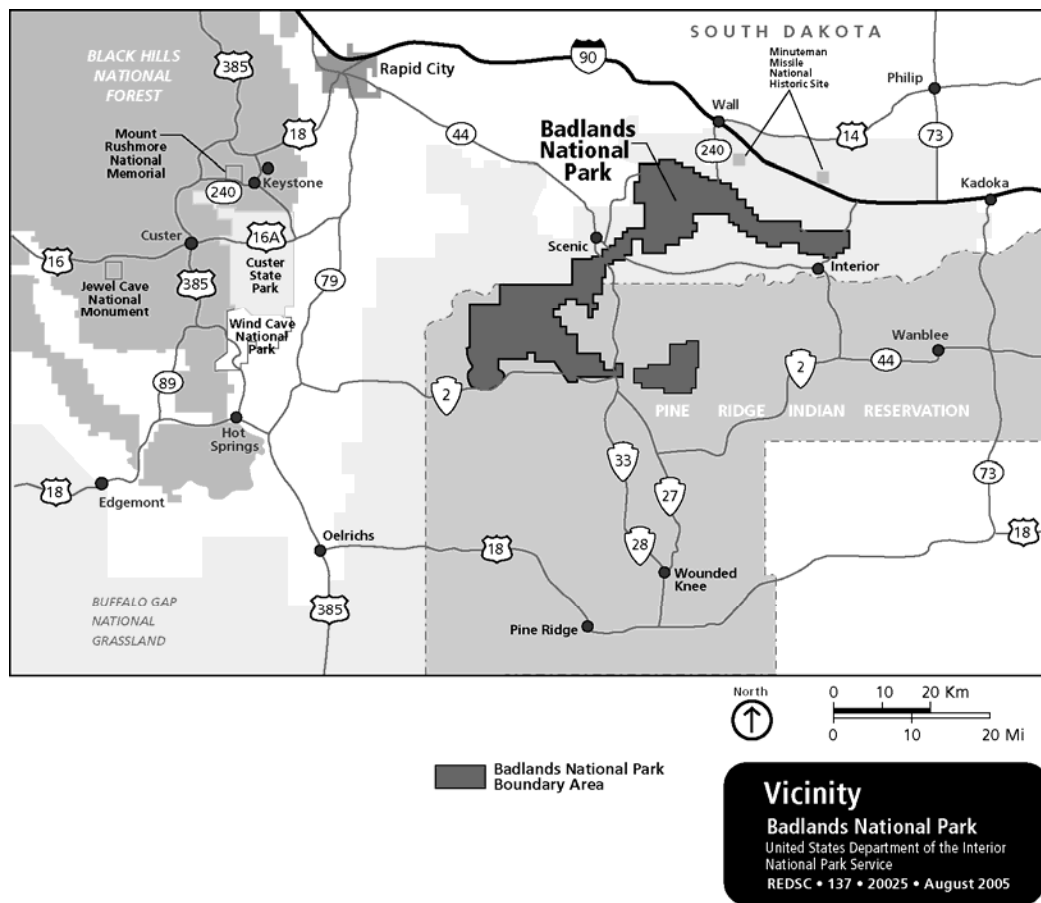
The park is divided into three units – the North Unit, the Stronghold Unit and the Palmer Creek Unit. The latter two are located within the Pine Creek Indian Reservation and are jointly managed under a cooperative agreement with the Oglala Lakota Nation. The North Unit, containing the 64,000-acre Badlands Wilderness Area, experiences the highest visitation. The Ben Reifel Visitor Center is in this unit, as are the Cedar Pass Lodge, the Cedar Pass Campground, the Castle Trail Complex, and the primary park roadway.

Most visitors travel through the park on South Dakota State Highway 240 (SH 240) between the Northeast Entrance (main entrance) off Interstate 90 Exit 131 (Cactus Flats) and the Pinnacles entrance off Interstate 90 Exit 110 (Wall). The 27-mile portion of SH 240 through the park is known as Badlands Loop Road and is the primary park roadway. Figure 2 shows the North Unit and the Loop Road. This paved road accesses the Cedar Pass area developments, trailheads in the Castle Trail Complex and pull off areas for overlooks. The park staff perceives a need for a shuttle servicing the various trailheads in the Castle Trail Complex during the prime visitation months of May through September. Thus, a demonstration transportation system will run for one or two seasons from May to September in order to decide if this is a worthwhile service to provide on a permanent basis.

1.2 Report Purpose

The purpose of this report is to provide recommendations for developing and evaluating a demonstration transportation system plan for a shuttle servicing the Castle Trail Complex in Badlands National Park. The recommendations include visitor use projections, a fleet operations and maintenance plan, a marketing plan to inform visitors about the service, recommendations for sustainable and environmentally sensitive operation, a financial plan, and an evaluation plan to determine if the goals of the demonstration system were met.

Figure 1 Vicinity Map



United States Department of the Interior

Source: National Park Service

National Park Service

DSC 137/20037

Figure 2 Badlands National Park North Unit Map



United States Department of the Interior

Source: National Park Service

National Park Service

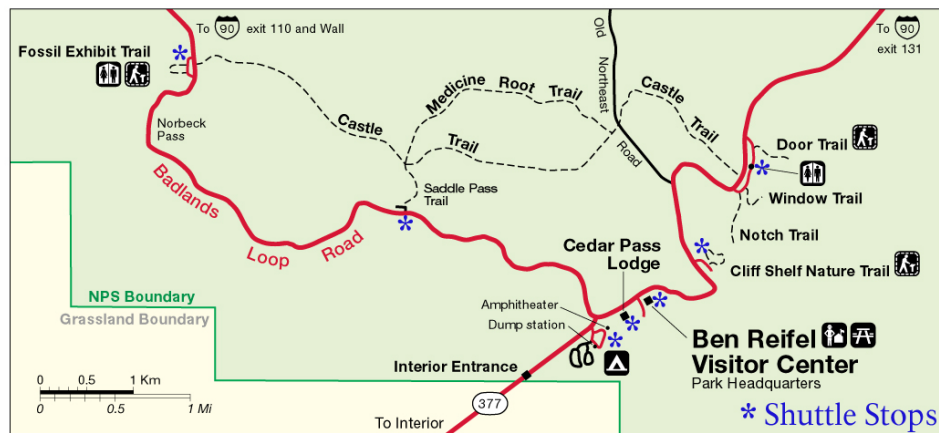
DSC 137/20038

2.0 CASTLE TRAIL COMPLEX

Figure 3 shows the Castle Trail Complex area. It is in the Cedar Pass area of the North Unit. Cedar Pass is currently the center of visitor information, accommodations and services including the Ben Reifel Visitor Center, park headquarters, Cedar Pass Lodge and Restaurant, and the Cedar Pass Campground. The Castle Trail Complex contains eight hiking trails of various lengths:

- Fossil Exhibit Trail
- Castle Trail
- Medicine Root Trail
- Saddle Pass Trail
- Door Trail
- Window Trail
- Notch Trail
- Cliff Shelf Nature Trail

Figure 3 Castle Trail Complex Area



United States Department of the Interior

Source: National Park Service

National Park Service

DSC 137/20039

With the exception of the Medicine Root Trail, each trail can be accessed via a trailhead adjacent to a parking lot. One parking lot serves the Door, Window, Notch, and Castle Trails. The Fossil Exhibit Trail parking lot also serves the west end of the Castle Trail. The Saddle Pass Trail has its own parking lot. The following trails are out-and-back type trails and can not be accessed by another trail:

- Fossil Exhibit Trail
- Door Trail
- Window Trail
- Notch Trail
- Cliff Shelf Nature Trail

The Medicine Root Trail is a branch of the Castle Trail and can only be accessed by it. The Saddle Pass Trail intersects the Castle Trail. Thus, these trails can be linked together to provide a longer hiking experience.

The park staff has identified a safety issue of visitors getting lost on the trails and ending up at a trailhead far from their origination. Thus, people walk along the Badlands Loop Road to reach the parking lot where they parked their vehicle or call park rangers for assistance. Some of the factors that contribute to the confusion on the trails include poor signage, intense heat and dehydration. The extreme temperatures experienced in the summer months coincide with the peak visitation months.

3.0 DEMONSTRATION TRANSPORTATION SYSTEM GOALS

In addition to increasing safety by picking up lost people, the system can expand opportunities for other Castle Trail Complex users. The goals of the demonstration transportation system (hereafter referred to as shuttle) are to:

- **Improve Service to Castle Trail Complex Users.** The park would like to increase recreational opportunities for bicyclists - a shuttle would provide an option to ride in a vehicle up hill and bicycle back down. Hiking route options increase if it is not necessary for visitors to begin and end their hike at the same trailhead. Visitors staying in the campground would have the option to leave their vehicles at the campsite and still access the visitor's center and the trailheads. Visitors that end up several miles from their initial trailhead would not have to contact park rangers to pick them up.
- **Increase Safety in the Castle Trail Complex.** Some visitors unintentionally end up at a different trailhead from the one at which they parked their vehicle and walk along the Loop Road to return to the correct parking lot. The Loop Road is not designed to accommodate both vehicles and pedestrians and conflicts occur. Some of these visitors are also dehydrated and need quick access to water.

- **Operate System with Minimal Resource Impacts.** The operation and maintenance of the shuttle vehicles needs to be environmentally sensitive. The system may reduce the number of vehicles using this section of the Loop Road and its parking lots, thereby decreasing wear and tear and maintenance requirements. However, a change of this nature will not be perceptible after only one or two years of shuttle operation.

4.0 VISITOR PROJECTIONS

This section presents five, ten and twenty year shuttle ridership projections. It includes an analysis of regional visitation trends along with the methodology used to forecast the shuttle ridership.

4.1 Regional Visitation Trends

South Dakota Tourism

Table 1 provides annual visitation statistics for a variety of regional tourist attractions. As shown, the most popular attractions in the region are in the National Park System. Popular destinations in the state include Custer State Park, the Lewis and Clark Recreation Area, the Crazy Horse Memorial and Badlands National Park. Badlands National Park attracted about 955,469 visitors during 2002, slightly less than Wind Cave National Park.

Table 1. Visitation to National Parks and Other Attractions, 2000 to 2002

	Location	2000	2001	2002	% Chg '00 - '02
Mount Rushmore National Memorial	South Dakota	2,522,288	2,570,271	2,922,002	16%
Custer State Park	South Dakota	1,693,887	1,666,938	1,820,154	7%
Lewis and Clark Recreation Area	South Dakota	1,028,697	1,071,621	1,070,190	4%
Crazy Horse Memorial	South Dakota	1,000,000+	1,000,000+	1,000,000+	0%
Wind Cave National Park	South Dakota	872,194	874,026	965,416	11%
Badlands National Park	South Dakota	1,105,824	955,469	927,762	-16%
Sturgis Rally	South Dakota	592,000	410,000	450,000	-24%
Devils Tower National Monument	Wyoming	383,468	375,596	404,934	6%
Corn Palace ¹	South Dakota	300,852	267,094	294,922	-2%

Appendix B: Study of Proposed Shuttle System

Redlin Art Center	South Dakota	234,648	231,304	195,552	-17%
Storybook Land ²	South Dakota	142,992	126,039	120,559	-16%
Jewel Cave National Monument	South Dakota	129,445	125,678	131,565	2%
Fort Sisseton State Park	South Dakota	107,799	111,219	107,862	0%
Mammoth Site	South Dakota	105,706	96,160	107,102	1%
Cultural Heritage Center	South Dakota	20,733	22,984	19,741	-5%

Note: 2002 visitor statistics were not yet available for many attractions.

¹Memorial Day to Labor Day only.

²April to October only.

Source: National Park Service, South Dakota Visitors Bureau

Because visitation to many attractions dipped in 2001, presumably as a result of the September 11 terrorist attacks, the analysis calculated the percent change in visitation between 2000 and 2002 for each attraction. Growth in the number of visitors occurred at a few other National Parks, such as Wind Cave National Park (11 percent). Notably, the Badlands has experienced reduced visitation during the last few years (discussed below).³

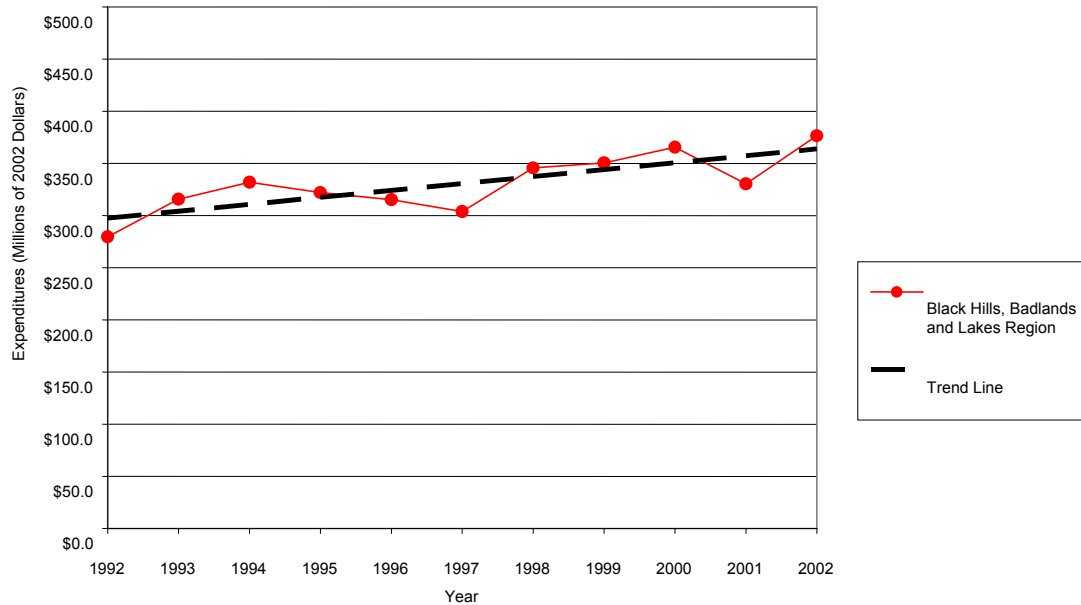
Table 2 and Figure 4 present South Dakota visitor expenditure. Total expenditures by visitors to the state were \$662.9 million dollars. More than half of tourist dollars are typically spent in the Black Hills, Badlands and Lakes region (57 percent in 2002). As shown in Figure 4, visitor expenditures remained relatively flat for most of the 1990's in real terms, with highest spending between 1998 and 2000. Visitor spending decreased during 2001 and then rebounded in 2002. Expenditure in the Black Hills, Badlands and Lakes Region tends to follow that of the state as a whole, and shows a slight upward trend over time.

³ Visitation statistics for other parks were included for comparative and contextual purposes, but are not the basis for Badlands visitation projections.

Table 2. South Dakota Visitor Expenditures by Region, 1992-2002(Millions of 2002 Dollars)

Year	Glacial Lakes and Prairies	Southeast	Great Lakes	Blackhills, Badlands & Lakes	Total All Regions
1992	\$56.4	\$109.5	\$57.7	\$279.6	\$503.2
1993	\$57.8	\$118.1	\$67.3	\$315.7	\$558.9
1994	\$70.2	\$125.2	\$77.2	\$331.9	\$604.6
1995	\$66.1	\$125.2	\$74.5	\$322.1	\$587.9
1996	\$64.4	\$121.9	\$76.6	\$315.4	\$578.2
1997	\$68.2	\$123.2	\$78.5	\$303.9	\$573.8
1998	\$72.6	\$142.0	\$82.0	\$345.7	\$642.3
1999	\$70.3	\$139.0	\$78.0	\$350.6	\$637.9
2000	\$70.1	\$136.3	\$77.0	\$365.5	\$649.0
2001	\$67.0	\$134.8	\$76.2	\$330.5	\$608.5
2002	\$69.7	\$140.2	\$76.4	\$376.6	\$662.9

Source: South Dakota Governor's Conference on Tourism

Figure 4. Visitor Expenditure Trend for the Black Hills, Badlands & Lakes Region

Source: South Dakota Governor's Conference on Tourism

Historic Visitation to Badlands National Park

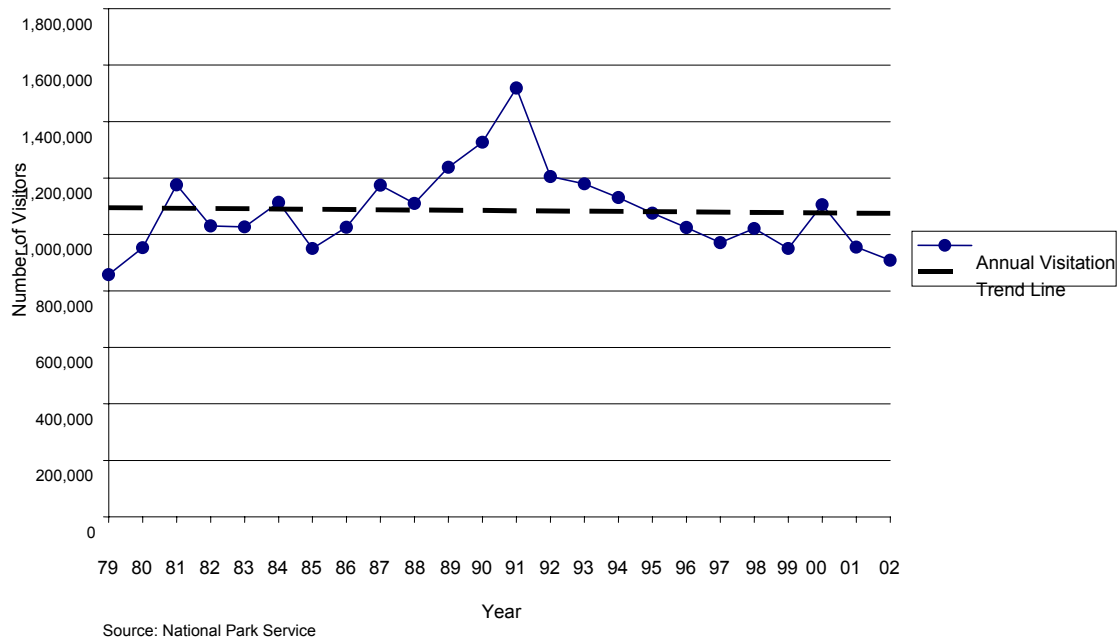
Badlands National Park is located about 70 miles east of Rapid City, and many park visitors consist of vacationers who make a relatively brief visit to the park on their way to other destinations. Table 3 and Figure 5 show that recreational visitation to Badlands National Park averages about 1 million persons annually. While the number of visitors fluctuates from year to year (generally in the range of about 900,000 to 1.2 million persons annually), the overall visitation trend remains relatively flat. Visitation has declined slightly in the past two years, but this is not inconsistent with a relatively stable long-term trend with an average of about 1 million annual visitors.

Table 3. Visitation to Badlands National Park, 1979 – 2001

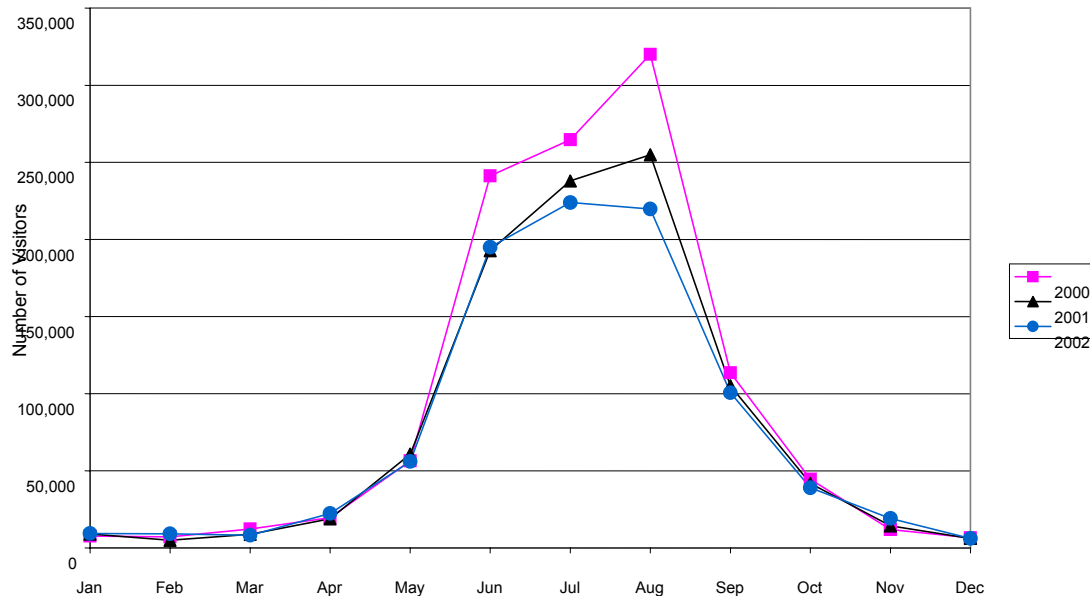
Year	Recreation Visits	Total Visits
1979	858,000	870,000
1980	952,652	964,652
1981	1,175,952	1,187,952
1982	1,030,484	1,042,484
1983	1,026,981	1,038,981
1984	1,113,675	1,125,675
1985	950,242	962,242
1986	1,025,630	1,037,630
1987	1,174,398	1,186,398
1988	1,110,040	1,122,040
1989	1,237,956	1,249,956
1990	1,326,475	1,338,475
1991	1,518,396	1,530,396
1992	1,205,297	1,224,161
1993	1,179,458	1,198,322
1994	1,130,459	1,149,323
1995	1,075,569	1,094,433
1996	1,024,705	1,043,569
1997	970,696	989,560
1998	1,021,049	1,039,913
1999	950,453	969,317
2000	1,105,824	1,124,688
2001	955,469	974,333
2002	908,898	927,762
Average Last 5 years	988,339	1,007,203
Average Last 10 years	1,032,258	1,051,122

Source: National Park Service

Figure 5. Recreational Visitors to Badlands National Park



Visitation to the park is highly seasonal, with the majority of visitors arriving between Memorial Day and Labor Day. Figure 6 shows that seventy-five percent of all visits in 2002 were in the months of June, July and August. Notably, the number of visitors during the low season months (October to May) appears to be relatively stable, with most annual variation occurring during the summer months.

Figure 6. Monthly Visitation to Badlands National Park, 1999-2001

Source: National Park Service

4.2 Badlands Visitor Patterns

This section includes a discussion of visitation patterns and visitor characteristics that provide the context for the projections of usage of the shuttle.⁴

Visitor Patterns and Characteristics

Following are key factors regarding visitation to Badlands National Park that will influence use of the shuttle:

- Most Badlands visitors enter the Park at the Northeast entrance. Most visitors are traveling from east to west (approximately 80 percent). The most common states from which visitors originate are Minnesota (9 percent), Wisconsin (9 percent), Illinois (8 percent) and Michigan (8 percent). Travelers are less likely to stop on their return trip, when they are more likely to be pressed for time.
- Most visitors come in family groups (61 percent), or with friends (20 percent) (Seven percent come with both, and another seven percent come alone). Many see the sign on the interstate and decide to visit at the spur of the moment.

⁴Information presented is from the 1999 Badlands General Management Plan, 2000 Visitor Survey, and interviews with Park staff.

- Most visitors (83 percent) stay in the park less than one day. Of those visitors, about 74% spent four hours or less. Campers and lodge visitors typically stay in the park one night.
- Sunday and Monday are the busiest visitor days.
- As Figure 7 shows, the most frequently visited sites by far are the Pinnacles Overlook (67%) and Ben Reifel Visitor Center (65%). Other popular sites include the Journey Overlook Picnic Area (39%), Roberts Prairie Dog Town (37%) and the Cedar Pass Lodge (36%).
- The number of bus tour groups visiting the park has been increasing in recent years. These groups tend to be on very tight schedules, and are very unlikely to make use of the shuttle system.

Hiker Characteristics

Hikers have been identified as the primary consumers of the shuttle. While not much information exists about their current usage of trails, following are key points based on the 2000 Visitor Study, conversations with park staff and other park documents:

- According to the 2000 Visitor Study, 40% of visitors report hiking on a maintained trail during their visit. However, most visitors are not likely to hike long distances.
- Park staff estimate that there are at least 50 to 100 hikers in the park most days during the high season, with less hiking occurring during July and August due to the heat. Visitors are also more likely to visit trails during the morning and late afternoon.
- Figure 8 shows that, of visitors who hike at the park, more than half visit the Fossil Exhibit Trail (54%). Other popular trails include the Door Trail (40%), the Windows Trail (38%) and the Cliff Shelf Trail (28%). The most popular trails are the shortest ones.⁵

⁵Because the survey was completed during August, the month that typically has the highest temperatures, it is probable that survey respondents were less likely to hike than shoulder season visitors.

Figure 7. Sites Visited This Visit

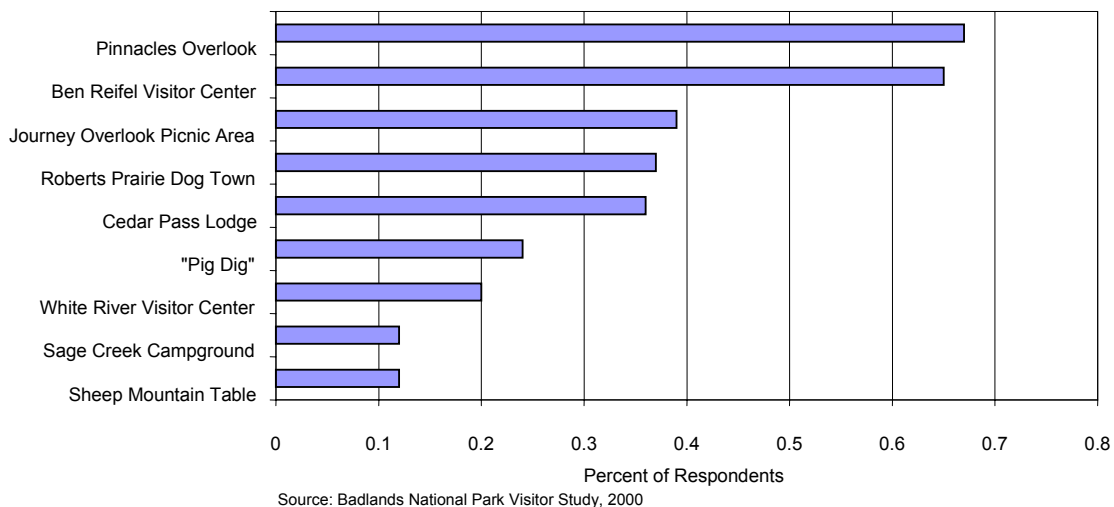
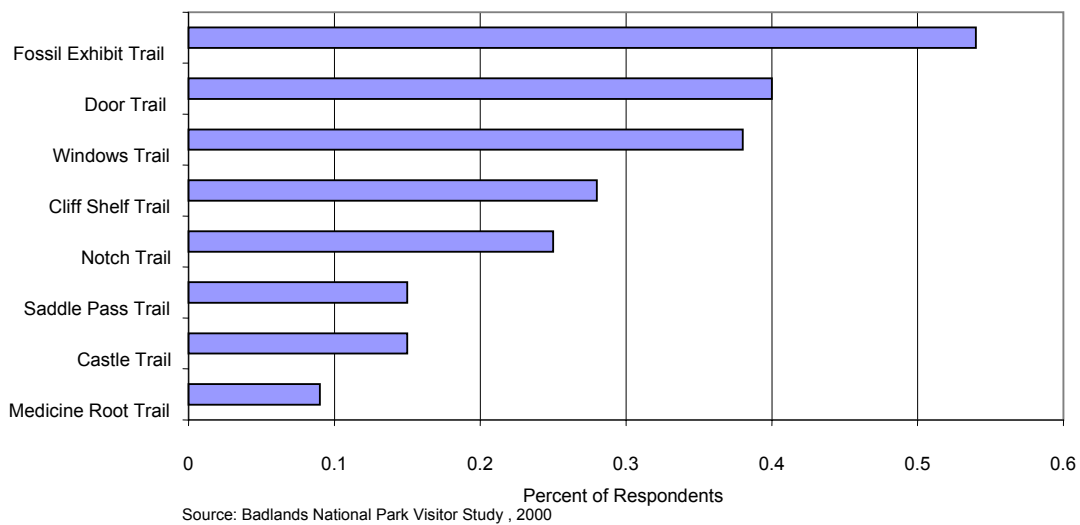


Figure 8. Trails Hiked During Visit to Badlands National Park



4.3 Ridership Projections and Planning Parameters

Based on experience and the discussion above, following are key considerations for ridership projections for the shuttle:

- A high percentage of visitors will not make use of the shuttle system because they do not plan to hike very far and do not plan to stay in the park long.
- Visitors who stay overnight in the park will be more likely to make use of the shuttle.
- Some visitors who do not intend to hike any of the trails will still choose to ride the shuttle as a way to view the park.
- While the highest visitation to the Badlands occurs in July and August, these are also the months with the warmest weather. Because visitors are less likely to hike in extreme heat and serious hikers are more likely to plan their trip during the shoulder seasons, shuttle usage will show less monthly variation than overall park visitation.

Five-, Ten- and Twenty-Year Projections

These projections assume that the shuttle will be marketed according to the Marketing Plan described below, including conspicuous signage and readily available information regarding shuttle stops and times. The projections also assume that the shuttle will be operated in accordance with the following operations plan, and that the shuttles will run according to schedule.

Table 4 presents the projections for the shuttle. Projections for Badlands National Park are included for comparative purposes. The analysis used a simple linear regression model to forecast park visitation, using annual Badlands visitation as the dependent variable and time as the independent variable.⁶ Because visitation to the Badlands shows a great deal of variation from year to year (see Figure 2), the analysis calculated a range of projections, with the regression results as the “medium” projection, and “low” and “high” projections calculated by adjusting the medium projections upward and downward by ten percent. The estimates of shuttle usage are calculated as a percentage of park visitation, assuming that 5% of visitors who stay in the Park five or more hours will use the shuttle.⁷ (According to the Visitor Survey, 27% of visitors stay in the park for five or more hours, but this figure was adjusted upward to 30%, assuming that

⁴The projection was based on visitation from 1979 to 2000 because this period was deemed to be more indicative of a long-term trend, based on conversation with Park staff.

⁵Five percent estimated based on conversations with Park Staff. ERA did not use other NPS shuttle systems as a benchmark because visitor characteristics and shuttle systems vary so greatly between Parks.

shoulder season visitors are slightly more likely to stay longer in the park because the weather is not as extreme). For both the Badlands National Park and the shuttle, “low” projections were calculated as 90 percent of the “medium” scenario, and “high” projections were calculated as 110 percent of the “medium” scenario.

Table 4. Shuttle Annual Ridership Projections

Year	Range	Badlands National Park	Castle Trail Complex Shuttle
Year 5	Low	999,630	14,994
	Medium	1,110,699	16,660
	High	1,221,769	18,327
Year 10	Low	1,004,535	15,068
	Medium	1,116,150	16,742
	High	1,227,765	18,416
Year 20	Low	1,014,346	15,215
	Medium	1,127,051	16,906
	High	1,239,756	18,596

Based on experience and the considerations discussed above, the shuttle is estimated to attract 16,660 riders in Year 5, 16,742 riders in Year 10, and 16,906 riders in Year 20 (under the medium scenario). These projections refer to one-way shuttle rides, given that many hikers and bicyclists that use the shuttle will only take the shuttle in one direction (as a means to return to their vehicle).

Design Day Projections

The “design day” shuttle ridership is estimated to assist in planning for the capacity requirements. The design day projections indicate the capacity requirements of high shuttle usage days, but are not intended to represent peak shuttle usage. These projections are intended to aid in designing the shuttle in order to comfortably accommodate peak crowd loads on a normal high day. (It should be noted that the shuttle is expected to carry significantly higher numbers of visitors on occasion, such as when a large group decides to ride the shuttle together).

Table 5 presents the projected design day shuttle usage. The design day estimates are based on projected shuttle usage in Year 5. Based upon the visitor patterns and weather considerations discussed above, a factor of 27% was applied to represent the peak month (June) as a percentage of annual visitation. While August is the peak month for park visitation, hikers are more likely to visit the Park during the shoulder season due to the summer heat. This estimate also takes into account the fact that the shuttle will only run between May and September. This yielded a peak monthly ridership of about 4,409 (under the medium scenario). The average weekly number of shuttle riders during the peak month is estimated as 1,052.

A factor of 16% is applied to represent the portion of weekly shuttle trips occurring on a weekend.⁸ This results in projected daily shuttle trips of 168 (under the “medium” scenario). Assuming 14% of design day visitors would use the shuttle during the peak hour, these estimates yield a required hourly capacity of 24 shuttle riders.⁹

Table 5. Projected Design Day Visitation

Planning Factors	Projected Shuttle Riders		
	Low	Medium	High
Annual Ridership	15,000	16,700	18,300
Peak Month as % of Year	27%	27%	27%
Estimated Peak Month Ridership	4,050	4,509	4,941
Number of Weeks in Month	4.3	4.3	4.3
Estimated Average Weekly Ridership During Peak Month	945	1,052	1,153
Estimated % of Weekly Ridership Occurring on a Peak Day	16%	16%	16%
Estimated Peak Day Ridership During Peak Month	151	168	184
Estimated % of Ridership Occurring During Peak Hour of the Design Day	14%	14%	14%
Estimated Peak Ridership During the Design Day	21	24	26

Source: Economics Research Associates

Note: Design Day shuttle usage based on Year 5.

⁶This percentage is based on the assumption that peak day ridership would be slightly higher than 14 percent, which would be the distribution if visitation were distributed evenly throughout the week, given that visitors who spend a longer amount of time in the park are more likely to ride the shuttle.

⁷ ERA estimated peak hourly shuttle trips based on the assumption that peak ridership will occur in the morning or late afternoon, when the heat is less severe (if ridership were distributed evenly throughout the day, 10 percent of daily shuttle riders would ride the shuttle each hour).

5.0 OPERATIONS AND MAINTENANCE PLAN

This section recommends an operations and maintenance plan for the shuttle. The shuttle will be free during the demonstration period, although the evaluation plan tests the willingness to pay for the service. It will accommodate pedestrians and bicyclists.

5.1 System Characteristics

Description: Shuttle route operating between the Door / Window / Notch Trail parking area and the Fossil Exhibit Trail parking area from May to September

Round-Trip Length: Approximately 15 miles

Stops: The shuttle will start at the Door / Window / Notch Trail parking area, travel to the Fossil Exhibit Trail parking area, turn around, and then travel back to the Door / Window / Notch Trail parking area. Intermediate stops include:

- Cliff Shelf Nature Trail parking area
- Ben Reifel Visitor Center
- Cedar Pass Lodge
- Cedar Pass Campground
- Saddle Pass Trail parking area

The shuttle will stop at the intermediate locations twice during each round trip (both going to the Fossil Exhibit area and coming from the Fossil Exhibit area).

The number of parking spaces required at the shuttle stops for the trailheads is estimated based on the visitor use projections, the percent of visitors using each trail and the average vehicle occupancy. No parking is assumed for the campground since each campsite has provisions for parking a vehicle. Furthermore, no additional shuttle parking is assumed to be necessary for the Visitor Center stop since anyone boarding the shuttle here presumably parked to visit the Visitor Center as well as use the shuttle.

It is assumed that the people using a particular trail will park at that trailhead for a period of two hours. The projections forecast a demand of 24 people per hour. As Figure 8 shows, the 2000 Summer Visitor Study captured the percentage of respondents that used each trail. This percentage is applied to the shuttle demand to determine how many people will park at each trailhead. Some of these people may have used more than one trail, so the number of trail users and, hence, vehicles, may be overstated. The visitors for the Castle and Medicine Root Trails are distributed amongst the Door/Window/Notch, Saddle Pass and Fossil Exhibit Trails since they can be accessed from each of these trailheads. The average vehicle occupancy used in this analysis is 2.4, which is based on information in the 2000 Air Emissions Inventory report. Table 6 shows the resulting parking space estimates.

Table 6. Estimated Parking Space Requirements Per Shuttle Stop

Shuttle Stop	Visitor Percentage	Visitors Per Hour	Visitor Accumulation	Vehicles
Door/Window/Notch	111	27	54	23
Cliff Shelf Nature	28	7	14	6
Saddle Pass	23	6	12	5
Fossil Exhibit	62	15	30	13

Running Speed: 15 miles per hour in heavy traffic conditions

Average Service Time at Each Stop: 2 minutes

Assumed Cycle Time: 90 minutes (includes travel time, stops and recovery time)

Schedule: 7 am to 8 pm every day from May 1 to September 30

Table 7 shows a sample service schedule for the morning time period.

Service Frequency: Every 45 minutes between 7 am and 10 am, every 90 minutes from 10 am to 5 pm, and every 45 minutes from 5 pm to 8 pm. The 45-minute frequency coincides with the peak activity periods in the park.

Fleet Requirements: 2 vehicles with a capacity of 20-25 passengers per vehicle. Each vehicle also must have the capacity to carry 2 to 3 bicycles and be ADA accessible.

Staffing Requirements: Four seasonal drivers – two drivers per day during the morning and evening periods; one driver per day during the mid-day period; one driver to provide relief for days off.

5.2 Operations and Maintenance

The NPS has two options for operating and maintaining the shuttle system. They are:

- Hire a contractor to provide the shuttle vehicles, operate the shuttle service, and maintain the vehicles. The contractor could be a local transit agency, private shuttle operator or concessionaire.
- Provide the shuttle vehicles and hire a contractor to operate the shuttle service and maintain the vehicles.

Operations of the shuttle system would include providing vehicle operators, data collection (boardings and alightings at each stop), monthly reporting of data, and other staff costs. It would not include marketing costs or provision of vehicle or shuttle stop signage. Maintenance duties would include general upkeep of the vehicles including fueling, cleaning, and preventative maintenance.

Badlands National Park staff currently services, stores and fuels their fleet of 49 gasoline and diesel vehicles at a maintenance facility near the Visitor Center. The capability of the park's vehicle maintenance staff and facility to accommodate two additional vehicles on a permanent basis is unknown. If the shuttles were to be made permanent, then the park would have to make an assessment of its overall capability to accommodate these additional two vehicles based on its experience with the demonstration program. An assessment would address the need for additional maintenance staff and expansion of maintenance facilities at Cedar Pass.

Table 7. Sample Service Schedule

STOP NO.	WESTBOUND - DOOR/WINDOW/NOTCH TO FOSSIL EXHIBIT						EASTBOUND - FOSSIL EXHIBIT TO DOOR/WINDOW/NOTCH						1
	1	2	3	4	5	6	7	6	5	4	3	2	
STOP NAME	DWN	CS	BR	CPL	CPC	SP	FE	SP	CPC	CPL	BR	CS	DWN
DWELL/LAYOVER (min)	10	2	2	2	2	2	10	2	2	2	2	2	0
TRAVEL TIME to next stop (min)	4	3	2	2	7	7	7	7	2	2	3	4	0
TOTAL TIME (min)	14	5	4	4	9	9	17	9	4	4	5	6	0
subtotal one-way trip						45							45
BUS A - Cycle 1	7:00A	7:14A	7:19A	7:23A	7:27A	7:36A	7:45A	8:02A	8:11A	8:15A	8:19A	8:24A	8:30A
BUS B - Cycle 1	7:45A	7:59A	8:04A	8:08A	8:12A	8:21A	8:30A	8:47A	8:56A	9:00A	9:04A	9:09A	9:15A
BUS A - Cycle 2	8:30A	8:44A	8:49A	8:53A	8:57A	9:06A	9:15A	9:32A	9:41A	9:45A	9:49A	9:54A	10:00A
BUS B - Cycle 2	9:15A	9:29A	9:34A	9:38A	9:42A	9:51A	10:00A	10:17A	10:26A	10:30A	10:34A	10:39A	10:45A
1	DWN	Door Window Notch Trail Parking Lot											
2	CS	Cliff Shelf Nature Trail Parking Lot											
3	BR	Ben Reifel Visitor Center											

APPENDIXES

4	CPL	Cedar Pass Lodge
5	CPC	Cedar Pass Campground
6	SP	Saddle Pass Trail Parking Lot
7	FE	Fossil Exhibit Trail

The major difference between the two options is the cost of acquiring the shuttle vehicles. Under the Option A, the contractor would provide the vehicles for the shuttle service. This could be a favorable option for NPS if funding to purchase the shuttle vehicles is not immediately available. Under Option B, NPS would provide the shuttle vehicles for the contract operator to operate and maintain. This may be the preferred option if there are no local operators that are able to provide vehicles.

Table 8 shows the vehicle and operating cost estimates for Options A and B. The operating cost estimates were calculated by multiplying the number of vehicle revenue hours by the estimated cost per revenue hour. The operating cost estimates shown are most likely higher than the cost of comparable contracted service in the Badlands Area and, therefore, are conservative estimates.

Table 8. Estimated Vehicle and Operating Costs for the Castle Trail Shuttle System

	Option A – Contractor provides vehicles	Option B – NPS provides vehicles
Vehicle cost - two 25-pass. buses with wheelchair lift (a) and bicycle rack (b)	\$0	\$171,600 (Diesel) \$231,600 (CNG)
Operator cost per revenue vehicle hour (c)	\$55	\$45 - \$50
Annual vehicle revenue hours (d)	2,907 hours	2,907 hours
Estimated annual operating cost	\$159,885	\$130,815 – \$145,350
Estimated vehicle + annual operating cost	\$159,885	\$302,415 – \$376,950

(a) Cost for a 25-passenger bus is about \$75,000 to \$105,000 depending on whether it is powered by diesel or an alternative fuel, such as Compressed Natural Gas (CNG). Cost for wheelchair lift is approximately \$10,000. Cost estimates obtained from Airline Coach Services, Burlingame, CA.

(b) Bicycle rack for 2 to 3 bicycles estimated at \$800. Cost for an 8- to 12-bicycle trailer would be \$6000. Cost estimates obtained from Sportworks in Woodinville, WA.

(c) Cost per vehicle revenue hour for Option A was averaged from the hourly costs to operate the Golden Gate Park Shuttle in San Francisco, CA (Airline Coach Services) and the Caltrain Shuttle Program in San Francisco/ San Mateo/ Santa Clara Counties, CA (San Mateo County Transit District). Cost per vehicle revenue hour for Option B was obtained from Zion National Park Shuttle in Springdale, UT (Parks Transportation, Inc.)

Number of vehicle revenue hours assumes 2 shuttle vehicles, 153 days of revenue service per year, and 13 revenue hours per day for the first shuttle and 6 hours per day for the second

As shown in Table 8, the total start-up costs of implementing the Castle Trail shuttle system would be 90 to 135 percent greater with Option B due to vehicle procurement costs. However, the annual operating costs for Option B are lower, since the vehicle purchases would be a one-time expense.

At Zion National Park in Utah, a private contractor, Parks Transportation, Inc (PTI), operates and maintains the shuttle system in the Park (Option B). NPS provides the vehicles (35 in fleet) and built a maintenance facility for the shuttle vehicles. PTI has a five-year contract, with five one-year options to continue afterward. The Zion Canyon shuttle route is similar to the proposed Castle Trail shuttle in that it operates seasonally (April through October), has a route of similar distance (16.4 miles round trip), and is also free of charge. It is different from the Castle Trail system because it serves an area that is restricted to private vehicles during its operation (resulting in high ridership), has twice as many stops (15 total), and runs at frequencies of 6 to 30 minutes throughout the day. The cost to operate the Zion shuttle is about \$44 per revenue vehicle hour. The contractor has a limited number of staff working during the off-season, and NPS compensates PTI about \$52,000 per month to cover staff expenses and to maintain the vehicles.¹⁰

6.0 MARKETING PLAN

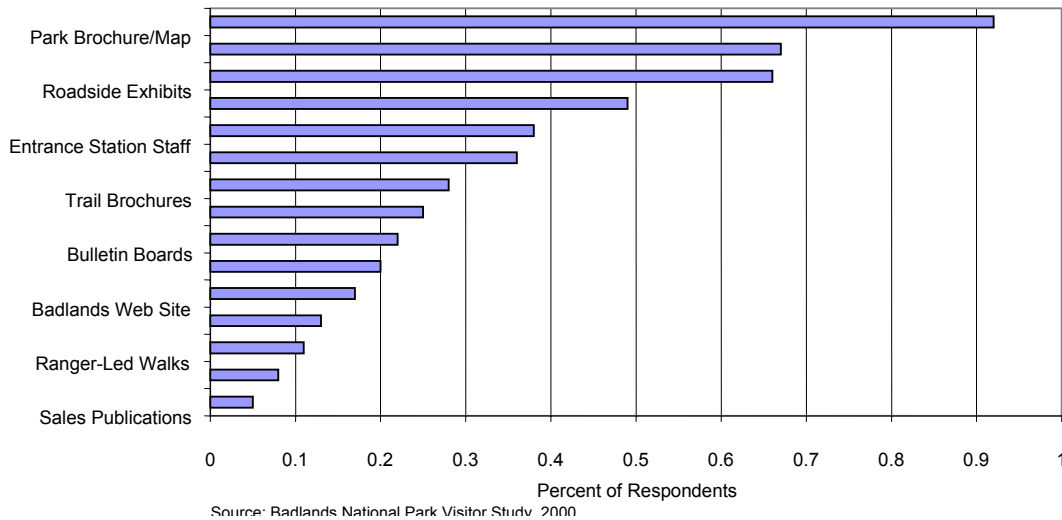
6.1 Factors Considered to Formulate Plan

In addition to the visitation patterns and visitor characteristics discussed above, following are additional factors considered in formulating the marketing plan for the shuttle:

- The majority of Badlands National Park visitors are visiting for the first time (about 65%), therefore are unlikely to know about the shuttle system prior to entering the Park. The most common sources of information consulted by visitors prior to visiting the Badlands are travel guides and tour books (48%) and friends or relatives (42%).
- According to the visitor survey, 18 percent of Badlands visitors consult the Badlands National Park web site prior to their visit, and 55 percent reported that they would prefer to use the Internet as a main source of information about the park in advance of their next visit.
- While in the park, the most common source of information used by visitors is the Badlands National Park Brochure (92%). As Figure 9 shows, visitors are also very likely to obtain information at the Visitor Center, roadside exhibits and from park staff.
- Most visitors speak English. According to the visitor survey, 93% of visitors are domestic and 7% are international. The most common sources of international visitors are Canada (4%), England (22%) and Germany (18%).

¹⁰ Correspondence with Kirk Scott, General Manager, Parks Transportation, Inc., February 2003.

Figure 9. Information Services Used This Visit



6.2 Specific Marketing Plan Recommendations

The marketing plan for the shuttle relies on a combination of conspicuous signage and easy to obtain information about the shuttle system. Below are specific recommendations for marketing the shuttle:

- Shuttle stops should be marked with conspicuous (colorful, large, and easy to read) signage. These signs will make visitors aware that the shuttle system exists, and make it easy for visitors to locate the shuttle stops.
- A Travelers Information System could be used in conjunction with signs on the Interstate to alert visitors to the presence of a shuttle system via car radio.
- Detailed information about the shuttle system should be available at the following locations:
 - In the park brochure (including on the park map) and in the park newspaper;
 - On bulletin boards at trailheads and overlooks
 - At all Park visitor centers, especially the Ben Reifel Visitor Center
 - At the Entrance Station
 - At the Cedar Pass Lodge and Gift Shop (if possible, information about the shuttle should be placed in each room)
 - In various locations in the campground area
 - From park staff
 - At other national parks including the Minuteman Missile National Historic Site
 - At regional tourist information centers and other area attractions such as Wall Drug, the National Grasslands Visitor Center, the Black Hills Visitor Information Center in Rapid City, and the Air and Space Museum

- On the Badlands National Park web site, by means of a prominent link.
- Marketing materials should include a detailed schedule of shuttle stops and pick-up times. Visitors will be more likely to use the shuttle if they feel confident about when the shuttle will pick them up and drop them off. The availability of a schedule will be especially important given that the majority of visitors only plan to spend a limited amount of time (less than one day) in the park.
- Shuttle stops should also include a posted schedule of stops and times. Ideally, stops should be placed in areas that receive shade.
- Marketing materials should feature examples of how the shuttle might be used by visitors (e.g., to reach and return from trailheads, to facilitate more appealing hikes, to view the Park without the hassle of driving, etc.) and highlight the fact that it is a free service for all visitors.
- The shuttle itself should be attractive and easily identified (e.g., “Badlands Free Shuttle System”).

7.0 EVALUATION PLAN

A thorough evaluation of the demonstration system measures its goal achievement and level of service, or performance. It will determine if the system is useful and its impacts on resources. The evaluation results serve as input to the decision to continue operation once the demonstration period ends. It is also valuable for understanding trends and assessing impacts of service and policy changes, and for monitoring performance of the contract operator. The evaluation effort includes monitoring several indicators of goal achievement and system performance. As previously mentioned, the goals of the demonstration transportation system are to improve service to Castle Trail Complex users, increase safety in the Castle Trail Complex and to operate the system with minimal resource impacts.

7.1 System Performance Indicators

The following are indicators of system performance:

- **Reliability:** The system is reliable if it maintains the designated headway, or takes the same amount of time to complete each round trip and adheres to the arrival and departure time at each stop. This assists visitors with planning when to be at the stop location. Another measure of reliability is if the shuttle stops at all the designated locations on each round trip.
- **Service Effectiveness:** The system should have enough capacity to accommodate the demand for passengers and bicyclists. Passenger trips per revenue mile and passenger trips per revenue hour are other measures of effectiveness.
- **Service Efficiency:** If there is a fare charged, the system efficiency is determined by comparing operating costs to revenue hours or revenue miles. The measure of revenue hours includes the cost of hiring the contract operator and any administrative, marketing and other costs that would be required to operate the shuttle program. If more routes were added in the future, the systemwide cost would include the operating costs for all routes. Another measure of system

efficiency is to compare the operating costs rate of increase to the increase of CPI for the Badlands Area.

- **Cost Effectiveness:** The cost effectiveness of operating the shuttle is evaluated by assessing the operating cost per passenger mile, the operating cost per passenger trip and the farebox recovery ratio (in the future if fares are collected).

7.2 Methods to Monitor Performance Measures

The following describes a way to monitor each indicator and the monitoring process:

Number of Users. This factor is an indicator of capacity and usefulness. The shuttle driver records the number of boarding passengers and bicycles at each stop by hour and day of week. This data serves to determine:

- Total number of riders on weekdays and weekends – compares supply to demand; service frequency may need to be modified daily or from the weekdays to weekends
- Appropriateness of operating hours – hours may be able to be adjusted based on demand
- Utilization of bicycle conveyance system - comparison of supply versus demand; the rack system may need to be expanded to a trailer system
- Usefulness of and need for each stop location – some locations may never be used and can be dropped from the route

- **Route Time.** This is an indicator of reliability. The shuttle driver should record the time at which the shuttle leaves the Door / Window / Notch Trails parking lot, leaves the Fossil Exhibit Trail parking lot, and arrives again at the Door / Window / Notch Trails parking lot. Comparing the actual roundtrip time to the planned round trip time determines if the shuttle stays on schedule. This information also assists with the calculation of percent of departures missed and percent of trips missed. This information serves as input to the vehicle revenue hours indicator.

- **Route Miles.** This provides input for passenger trips per mile and revenue hours indicators. The shuttle driver should record the mileage traveled each day of operation. Ideally, this will not vary from day to day.

- **Visitor Experience.** This factor indicates user satisfaction with the system performance and if the goals are being met. The shuttle driver hands each boarding group a survey form and pencil and collects them as the group alights. The survey also provides information on visitor use patterns and suggestions for improvements and changes. The survey should be quick and easy to complete. The following recommends questions and an answer format:

- Where did you get on / off the shuttle? Provide a list of each stop location.
 - How long did you wait for the shuttle? Provide a list of time ranges.
 - Was the wait satisfactory? Yes or no./
 - Were you able to board the first shuttle that came along? Yes or no.
 - Were the stops in convenient locations? Yes or no.
 - What other locations would you use? Fill in the blank.
 - Did you hike on the trails? Yes or no.
 - If you biked, was the bicycle rack easy to use? Yes or no.
 - Would you use this shuttle again? Yes or no.
 - Would you pay for this service? Yes or no.
 - If you would pay, how much would you be willing to pay? Provide cost ranges.
 - How did you find out about the shuttle system? Provide list in website, visitor's center, family/friends, park brochure, previous visit, saw it in a parking lot
 - Was the vehicle clean? Yes or no.
 - Was the driver able to answer your questions about the Castle Trail area? Yes or no.
 - Was the driver courteous? Yes or no.
 - Do you have any comments or suggestions? Fill in the blank.
-
- **Accident Records.** This factor is an indicator if the goal of improving safety is met. Comparing previous years' records for accidents to the year the shuttle is in operation determines if the goal of improving safety is met. There may be a noticeable reduction in accidents between pedestrians or bicyclists and motor vehicles on this section of the Loop Road.
 - **Resource Impacts.** Air quality models calculate the Park's overall vehicular emissions to be minor and to not cause an attainment problem. Hence, the additional emissions from the shuttle likely will not significantly increase the Park's overall emissions nor cause an attainment problem. Therefore, monitoring of the emissions from the shuttle vehicle is not required.

The number of users, route time, route miles, and visitor experience indicators should be monitored daily throughout the five-month operational length of the demonstration system. This amount of data should provide a clear indication of use patterns, system performance and goal achievement. The accident records should be reviewed and compared to previous years after the demonstration period is over. Operating costs should be compiled after the demonstration period is over and comparisons made to the other indicators to determine efficiency and effectiveness.

The contract between NPS and PTI to provide the Zion shuttle service includes some good examples of performance measures that could also be used for the Castle Trail shuttle. These include:

- **On-time performance:** Maintain 93% OTP (over a one-month period) within 0 minutes early and 5 minutes late of scheduled times at a

minimum of three time points along the route. Penalties for not meeting the 93% standard include a 1% deduction from the month's invoice for OTP of less than 93%, and a 5% deduction from the month's invoice for OTP of less than 87%. A deduction of \$100 per incidence is taken from the month's invoice for recorded schedule deviations of more than 1 minute early.

- **Missed trips:** 99% of trips scheduled per month must be completed. The penalty for completing less than 99% of scheduled trips is a deduction equal to 3% of the month's invoices. Any missed trip that is the last scheduled trip of the day is counted as 3 missed trips.
- **Preventative maintenance:** 100% of preventative maintenance inspections are to be completed at every 500 mile interval. A deduction of \$500 is taken from the month's invoice for each infraction.
- **Equipment maintenance:** Contractor is required to maintain government provided maintenance equipment. 100% of preventative maintenance of equipment must be completed within manufacturer's recommended timeframe. A deduction of \$500 is taken from the month's invoice for each infraction. Contractor is responsible for any repairs that would have been covered by warranty for the duration of the warranty time period.
- **Driver training:** Contractor must comply with contract requirements. A deduction of \$100 a day will be taken for every day that a driver does not meet the requirements.
- **Submission of monthly reports:** Contractor is required to submit monthly reports with the submittal of monthly invoices. Invoices will not be paid if monthly reports are not provided.
- **Wheelchair lifts:** Wheelchair lifts will operate at all times when in transit service. A deduction of \$100 will be taken from the month's invoice for each incidence where a wheelchair lift does not operate and the individual and his/her party is not accommodated by the contractor within 10 minutes.
- **Cleanliness:** Buses must meet contract standards and requirements for cleanliness. A deduction of \$100 a day will be taken from the month's invoice if contractor does not comply with this standard.
- **Heating System:** Bus heating systems must be able to work at all times when bus is in revenue service. A deduction of \$100 a day will be taken from the month's invoice if contractor does not comply with this standard.
- **Accidents:** the Contractor shall not experience more than 1.25 preventable passenger and vehicular accidents (using the National Safety Council definition) per 100,000 miles traveled. A deduction of \$1000 per accident will be taken from the month's invoice if contractor does not comply with this standard.

8.0 ENVIRONMENTALLY SENSITIVE DESIGN AND OPERATING GUIDANCE

8.1 Shuttle Bus Environmental Issues

Shuttle bus environmental issues are related to air emissions and vehicle maintenance facilities and practices. Shuttle buses with a carrying capacity of 15 to 20 can be either heavy-duty gasoline or diesel vehicles (HDGVs or HDDVs).

8.2 Current Vehicle Emissions

Heavy-duty vehicles in the current Badlands NP fleet are almost exclusively diesel vehicles. A recent study of air emissions at the park quantified the air emissions generated by these HDDVs and the park's light-duty gasoline vehicles and trucks.¹¹

Emission factors produced by the U.S. Environmental Protection Agency (EPA) *MOBILE6.2*¹² model were used in conjunction with vehicle miles traveled (VMT) data in order to estimate mobile source emissions for volatile organic compounds (VOC) (both exhaust and evaporative), nitrogen oxides (NO_x), and carbon monoxide (CO). Similarly, emission factors produced by the EPA *PART5* model were used in conjunction with VMT data to estimate particulate matter (PM₁₀) emissions. A summary of current park vehicle emissions operating on conventional gasoline and diesel fuels is provided in Table 9. As the data in Table 9 indicate, the current heavy-duty diesel vehicle fleet accounts for less than 10 percent of the total park VMT and contributes a similar fraction to the park's total vehicle emissions.

Table 9. Badlands National Park Vehicle Emissions

Vehicle Type	VMT	Emissions (lbs/year)			
		PM ₁₀	VOC	CO	NO _x
Light-Duty Gasoline Vehicles	394,762	753	681	13,900	710
Light-Duty Gasoline Trucks	102,200	196	223	4,463	281
Heavy Duty Diesel Vehicles	36,710	92	40	528	1,350
Total	533,672	1,041	945	18,891	2,341

¹¹ EA Engineering, Science, and Technology. 2003. *2000 Air Emission Inventory, Badlands National Park, South Dakota*. February.

¹² USEPA. 2002. *User's Guide to MOBILE6.1 and MOBILE6.2 Mobile Source Emission Factor Model*. EPA420-R-02-010. Office of Air and Radiation. March.

8.3 New Shuttle Bus Emissions

Emissions associated with the proposed shuttle system were calculated for both heavy-duty gasoline buses and heavy-duty diesel buses based on the estimated annual VMT for the shuttle buses. Table 10 shows the results.

Table 10. Proposed Castle Trail Shuttle Bus Emissions

Vehicle Type	VMT	Emissions (lbs/year)			
		PM ₁₀	VOC	CO	NO _x
Heavy-Duty Gasoline Bus	29,835	61	59	1,649	247
Heavy-Duty Diesel Bus	29,835	75	33	429	1,097

As the data indicate, emissions from a shuttle bus system would increase emissions from the park's heavy-duty vehicle fleet by about 80 percent, but is still a small percentage of the park's total vehicle emissions. For example, the addition of diesel shuttle buses would increase vehicle NO_x emissions in the park by approximately 3 percent, while all other pollutants would be less than 1 percent, and these increases would be too small to be detected by air monitoring stations in the region. In addition to gasoline- and diesel-powered buses, biodiesel fuel may be a viable alternative for the proposed shuttle bus, as well as for the park's current heavy-duty diesel vehicles.

8.4 Biodiesel Fuel

Biodiesel is a domestically produced, renewable fuel that can be used in unmodified diesel engines with current refueling infrastructure. Performance, storage requirements, and maintenance are similar for biodiesel blends and petroleum diesel fuels. Biodiesel is made by chemically reacting alcohol with vegetable oils, fats, or greases. It is often used in blends, such as B20, which is a 20 percent blend with diesel fuel. Biodiesel blends are sensitive to cold weather and may require special anti-freezing precautions. Biodiesel also acts as a detergent additive and may loosen and dissolve sediments in storage tanks that may need to be cleaned.

A number of National Park Service western units have implemented biodiesel fuel programs. For example, Yellowstone NP has utilized B20 in three employee commuter buses that have operated for approximately 100 miles per day for the last several years. The park has also successfully utilized a 100 percent rapeseed ethyl ester fuel in a pickup truck that has accumulated over 130,000 miles. In 2002, Yellowstone, Grand Teton, and Grand Canyon NPs implemented biodiesel fuel programs for all park-operated diesel vehicles.

Due to the increasing interest in the use of biodiesel fuel, the Environmental Protection Agency (EPA) recently conducted an analysis of available biodiesel emission data.¹³

¹³ U.S. Environmental Protection Agency. 2002. *A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions*. Draft Technical Report. EPA420-P-02-001. October.

Table 11 summarizes the estimated changes in regulated emissions relative to those from current diesel fueled heavy-duty highway engines for a 20 percent soybean-based biodiesel fuel.

As noted in Table 11, all emissions decreased by a measurable degree, except NO_x, which is a principal component in the formation of ozone or smog. However, ozone is a principal concern primarily on the East Coast and southern California, while particulate matter and organics contribute to the impairment of visibility in the western states. Table 12 provides a comparison of emissions from park vehicles operating on diesel fuel and biodiesel.

Table 11. Emission Impact of 20 Percent Biodiesel Relative to Diesel Fuel

Pollutant	Percent Change
Particulate Matter (PM ₁₀)	-10.1
Carbon Monoxide (CO)	-11.0
Nitrogen Oxides (NO _x)	+2.0
Hydrocarbons (HC)	-21.1

Table 12. Badlands National Park Vehicle Emissions

Vehicle Type	VMT	Emissions (lbs/year)			
		PM ₁₀	VOC	CO	NO _x
Diesel Fuel					
Current Heavy-Duty Diesel Vehicles	36,710	92	40	528	1,350
Proposed Diesel Shuttle Bus	29,835	75	33	429	1,097
Total	66,545	167	73	957	2,447
Biodiesel Fuel					
Current Heavy-Duty Vehicles	36,710	82	36	416	1,377
Proposed Biodiesel Shuttle Bus	29,835	67	26	382	1,119
Total	66,545	149	62	798	2,496

8.5 Vehicle Maintenance Pollution Prevention

The addition of two shuttle buses to the park's heavy-duty fleet will not impose significant burdens on the park's vehicle maintenance operations that may have environmental impacts. It does, however, provide an opportunity to review a number of vehicle maintenance operations that can benefit from pollution prevention measures. These include:

- air conditioning refrigerant recycling/reclamation
- used oil recycling/reuse
- used oil filter management
- waste antifreeze/coolant recycling
- waste battery management
- spent degreaser/solvent management
- sorbents and wipes management
- wastewater management (e.g., oil/water separators)

The National Park Service has created a source of information for NPS employees to use in furthering “greening” activities at the park level. A web site titled “Green Toolbox” has been created to further the adoption of pollution prevention measures and institute resource conservation practices in park maintenance and other operations. There are many additional sources of related information at the federal level (e.g., EPA and GSA) and state level (e.g., South Dakota Department of Environment and Natural Resources, Water Resources Assistance Program, Pollution Prevention Program).

9.0 FINANCIAL PLAN

This section presents a financial plan for operating the shuttle system. Based on the annual operating costs presented in Table 8 and the estimated annual ridership of 16,660 passengers in Year 5, the cost to operate the shuttle would range from \$7.85 to \$9.60 per passenger as shown in Table 13.

Table 13. Estimated Cost per Passenger to Operate the Castle Trail Shuttle System

	Option A – Contractor provides vehicles	Option B – NPS provides vehicles
Estimated operating cost	\$159,885	\$130,815 – \$145,350
Cost per passenger for 16,660 annual passengers (a)	\$9.60	\$7.85 - \$8.72

(a) Annual ridership for Year 5 of Shuttle, Economics Research Associates, February 2003.

Because the shuttle service would be provided to passengers free of charge, no fare revenue would be collected to offset these operating expenses. Passenger surveys or some other sensitivity analysis could be conducted to determine passengers’ willingness to pay for the shuttle service in the future. Given the estimated operating cost of approximately \$8 to \$10 per passenger, it would be unlikely that passengers would be willing to pay a fare that would cover the full operating costs of the shuttle. These per passenger costs would decrease if more passengers were attracted to use the shuttle. Given that the estimated annual ridership is equivalent to an average of less than 10 passengers per shuttle trip, there is substantial vehicle capacity (up to 25 passengers per vehicle) that could accommodate more persons.

Financing the shuttle could be achieved by increasing the Badlands Park entrance fee and by requesting the use of other NPS funding sources. At Zion National Park, the entrance fee was increased from \$10 to \$20 to help subsidize the cost of the shuttle program. The additional \$10 from the entrance fee goes to a general transportation fund (623 Account) of which a portion is used to cover about 60 percent of the shuttle operating costs. The remainder of the shuttle costs is supplemented from the revenue that is generated from the sales of the National Parks Pass. Zion National Park staff was authorized by NPS headquarters to use a portion of this revenue to fund the remaining 40 percent of shuttle costs.¹⁴

¹⁴ Correspondence with Pat Fesler, Budgets Department, Zion National Park, March 2003.

10.0 LIST OF PREPARERS

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APPENDIX C: SCIENTIFIC NAMES OF PLANTS AND ANIMALS DISCUSSED IN THIS PLAN

Common Name	Scientific Name
ANIMALS	
Atlantis fritillary butterfly	<i>Speyeria atlantis</i>
badger	<i>Taxidea taxus</i>
bison	<i>Bison bison</i>
black-footed ferret	<i>Mustela nigripes</i>
black-tailed prairie dog	<i>Cynomys ludovicianus</i>
bobcat	<i>Felis rufus</i>
boreal chorus frog	<i>Pseudacris triseriata</i>
bullsnake	<i>Pituophis melanoleuc</i>
cabbage white butterfly	<i>Pieris rapae</i>
checkered white butterfly	<i>Pontia protodice</i>
clouded sulphur butterfly	<i>Colias philodice</i>
common wood nymph butterfly	<i>Cercyonis pegala</i>
common checkskipper butterfly	<i>Pyrgus communis</i>
coyote	<i>Canis latrans</i>
deer mouse	<i>Peromyscus maniculatus</i>
Delaware skipper butterfly	<i>Anatrytone logan</i>
eastern cottontail rabbit	<i>Sylvilagus floridus</i>
eastern tiger swallowtail butterfly	<i>Pterourus glaucus</i>
elm bark beetle	<i>Scolytus multistriatus</i>
elm leaf beetle	<i>Pyrrhalta luteola</i>
Great Plains toad	<i>Cognatus bufonidae</i>
hackberry emperor butterfly	<i>Asterocampa celtis</i>
least chipmunk	<i>Eutamias minimus</i>
melissa blue butterfly	<i>Lycaeides melissa</i>
mountain lion	<i>Felis concolor</i>
mourning cloak butterfly	<i>Nymphalis antiopa</i>
mule deer	<i>Odocoileus hemionus</i>
muskrat	<i>Ondontra zibehicus</i>
painted lady butterfly	<i>Vanessa cardui</i>
pearl crescent butterfly	<i>Phyciodes tharos tharos</i>
prairie rattlesnake	<i>Crotalus viridis</i>
pronghorn antelope	<i>Antilocapra americana</i>
rattlesnake	<i>Crotalus spp.</i>
red admiral butterfly	<i>Vanessa atalanta</i>
red fox	<i>Vulpes vulpes</i>
regal fritillary butterfly	<i>Speyeria idalia</i>
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>
striped hairstreak butterfly	<i>Satyrrium liparops</i>
sturgeon chub	<i>Macrhybopsis gelida</i>
swift fox	<i>Vulpes velox</i>
variegated fritillary butterfly	<i>Euptoieta claudia</i>

Common Name	Scientific Name
viceroy butterfly	<i>Basilarchia archippus</i>
western plains garter snake	<i>Thamnophis radix</i>
Wiedemer's admiral butterfly	<i>Basilarchia weidemeyerii</i>
white-tailed deer	<i>Odocoileus virginianus</i>
Woodhouse's toad	<i>Bufo woodhousii</i>
ANIMALS (continued)	
<u>Birds</u>	
American robin	<i>Turdus migratorius</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
barn owl	<i>Tyto alba</i>
barn swallow	<i>Hirundo rustica</i>
cliff swallow	<i>Hirundo pyrrhonota</i>
ferruginous hawk	<i>Buteo regalis</i>
golden eagle	<i>Aquila chrysaetos</i>
grasshopper sparrow	<i>Ammodramus savannarumi</i>
horned lark	<i>Eremophila alpestris</i>
killdeer	<i>Charadrius vociferus</i>
lark bunting	<i>Calamospiza melanocorys</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
long-eared owl	<i>Asio otus</i>
mourning dove	<i>Zenaida macroura</i>
northern harrier	<i>Circus cyaneus</i>
peregrine falcon	<i>Falco peregrinus</i>
prairie falcon	<i>Falco mexicanus</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
sharp-tailed grouse	<i>Tympanuchus phasianellus</i>
snowy owl	<i>Nyctea scandiaca</i>
Swainson's hawk	<i>Buteo swainsoni</i>
western meadowlark	<i>Sturnella neglecta</i>
whooping crane	<i>Grus Americana</i>
wild turkey	<i>Meleagris gallopavo</i>
PLANTS	
<u>Grasses and Forbs</u>	
alfalfa	<i>Medicago sativa</i>
Barr's milkvetch	<i>Astragalus barrii</i>
blue grama	<i>Bouteloua gracilis</i>
buffalo grass	<i>Buchloe dactyloides</i>
Canada thistle	<i>Cirsium arvense</i>
crested wheatgrass	<i>Agropyron cristatum</i>
Dakota buckwheat	<i>Eriogonum visheri</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
downy brome	<i>Bromus tectorum</i>
Easter daisy	<i>Townsendia exscapa</i>
field bindweed	<i>Convolvulus arvensis</i>
giant ragweed	<i>Ambrosia trifida</i>
green needlegrass	<i>Stipa viridula</i>
hairy virgin's bower	<i>Clematis hirsutissima</i>

Common Name	Scientific Name
halogeton	<i>Halogeton glomeratus</i>
hoary cress	<i>Cardaria draba</i>
Hopi tea	<i>Thelesperma megapotamicum</i>
houndstongue	<i>Cynoglossum officinale</i>
Japanese brome	<i>Bromus japonicus</i>
Kentucky bluegrass	<i>Poa pratensis</i>
PLANTS (continued)	
<u>Grasses and Forbs</u> (continued)	
largeflower Townsend daisy	<i>Townsendia grandiflora</i>
leafy spurge	<i>Euphorbia esula</i>
little bluestem	<i>Andropogon scoparius</i>
needle and thread	<i>Stipa comata</i>
prairie coneflower	<i>Ratibida columnifera</i>
prairie cordgrass	<i>Spartina pectinata</i>
prairie dropseed	<i>Sporobolus heterolepis</i>
puncture vine	<i>Tribulus terrestris</i>
Russian knapweed	<i>Centaurea repens</i>
Sidesaddle (or Secund) bladderpod	<i>Lesquerella arenosa</i> var. <i>argillosa</i>
side-oats grama	<i>Bouteloua curtipendula</i>
silver-mounded candleflower	<i>Cryptantha cana</i>
smooth brome	<i>Bromus inermis</i>
sow thistle (perennial)	<i>Sonchus arvensis</i>
spotted knapweed	<i>Centaurea maculosa</i>
switchgrass	<i>Panicum virgatum</i>
threadleaf sedge	<i>Carex filifolia</i>
western wheatgrass	<i>Agropyron smithii</i>
white milkwort	<i>Polygala alba</i>
yellow sweetclover	<i>Melilotus officinalis</i>
<u>Trees and Shrubs</u>	
American elm	<i>Ulmus americana</i>
American plum	<i>Prunus americana</i>
broom snakeweed	<i>Gutierrezia sarothrae</i>
green ash	<i>Fraxinus pennsylvanica</i>
Parry's rabbitbrush	<i>Chrysothamnus parryi</i>
peachleaf willow	<i>Salix amygdaloides</i>
plains cottonwood	<i>Populus deltoides</i>
ponderosa pine	<i>Pinus ponderosa</i>
Rocky Mountain juniper	<i>Juniperus scopulorum</i>
sand sagebrush	<i>Artemisia filifolia</i>
silver sagebrush	<i>Artemisia cana</i>
silverscale saltbush	<i>Atriplex argentea</i>
tamarisk	<i>Tamarix parviflora</i>
three-leaved sumac	<i>Rhus trilobata</i>
western snowberry	<i>Symphoricarpos occidentalis</i>
Yucca	<i>Yucca glauca</i>

APPENDIX D: CORRESPONDENCE FROM U.S. FISH AND WILDLIFE SERVICE ABOUT THREATENED AND ENDANGERED SPECIES

 PHONE MESSAGE United States Department of the Interior / National Park Service / Denver Service Center 12795 West Alameda Parkway / P.O. Box 25287 / DSC-PM / Denver, CO			
Project:	Badlands GMP		Date: November 18, 2003
NPS PMIS No:		Time:	
Call To:	Joy Gober		Phone Number: (605) 224-8693, x27
Subject:	Threatened & endangered species in the vicinity of the North Unit of Badlands National Park		
Discussion:	The USFWS South Dakota web site (http://southdakotafieldoffice.fws.gov/endsppbycounty.htm) lists 3 threatened and endangered species in Jackson County (whooping crane, bald eagle, and black-footed ferret) and 4 threatened & endangered species in Pennington County (whooping crane, bald eagle, least tern, and black-footed ferret). (The black-footed ferret is a proposed/experimental population in both counties.) Ms. Gober confirmed that this list is still accurate.		
Follow-Up Tasks:			
Copies To:	TIC	With Attachment	By Mail
	PIFS	Without Attachment	By NPS mail System
	Project Files	By fax	By electronic mail
By:			
Project Manager:		Telephone No:	

APPENDIX E: ANALYSIS OF BOUNDARY ADJUSTMENT AND LAND PROTECTION CRITERIA

The National Park and Recreation Act of 1978 (16U.S.C. § 1a-7) directs the National Park Service to consider, as part of a planning process, what modifications of external boundaries might be necessary to carry out park purposes. Subsequent to this act, Congress also passed Public Law 101-628, the Arizona Desert Wilderness Act. Section 1216 of this act, codified at 16 U.S.C. §1a – 12, directs the secretary of the interior to develop criteria to evaluate any proposed changes to the existing boundaries of individual park units. 16 U.S.C. §1a-13 calls for among other things the National Park Service to consult with affected agencies and others regarding a proposed boundary change, and to provide a cost estimate of acquisition cost, if any, related to the boundary adjustment. The legislation also requires that a statement on the relative priority of acquisition of each parcel be provided.

These legislative provisions are implemented through NPS *Management Policies*, which state that the National Park Service will conduct studies of potential boundary adjustments and may make boundary revisions as follows:

- To protect significant resources and values, or enhance opportunities for public enjoyment related to the purposes of the park
- To address operational and management issues, such as the need for access or the need for the boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads, or
- Otherwise protect park resources critical to fulfilling park purposes

Two additional criteria must be met if the acquisition would be made using appropriated funds, and not merely a technical boundary revision; the criteria set forth by Congress at 16 U.S.C. 4601-9(c)(2) must be met. NPS *Management Policies* (2001), section 3.5, states the following criteria:

- The added lands will be feasible to administer, considering their size, configuration, ownership, and hazardous substances, costs, the views of and impacts on local communities and surrounding jurisdictions, and other factors such as presence of exotic species
- Other alternatives for management and resource protection have been considered and are not adequate

During the course of the planning process, three areas have been identified as potential additions to Badlands National Park. These additions are the Dougan Property, Kudnra /USFS property, and Priairie Homestead. The following is a review of the criteria for boundary adjustments as applied to Badlands National Park. This review is included as supporting documentation for the alternatives, which includes a recommendation for boundary changes in the North Unit of the park.

This plan does not address the legislative requirement to provide a cost estimate for the boundary adjustment nor does it include the relative priority for acquisition. However, the legislative proposal for the boundary adjustment and accompanying support materials would include both of these requirements.

DOUGAN PROPERTY

Description of the Property

The property is approximately 4,500 acres adjacent to Badlands National Park in Pennington County, South Dakota. The property is along the western boundary of the North Unit of the park and is immediately adjacent to the park's designated wilderness. The property is currently owned by Danny Dougan, a local ranger. These lands were originally included in the monument boundary but were removed by Congress in 1952 and 1957 (Mattison and Grom, 1970). The boundary adjustments were made by Congress because these were private lands and at that time the owners of this land were not willing sellers. Congress was also reducing the cost of land acquisition for the monument. The current owner of the land is interested in seeing his lands added to the park.

Criteria: To protect significant resources and values, or opportunities for public enjoyment related to the purposes of the park.

One of the purposes of Badlands National Park is to preserve the flora, fauna, and natural processes of the mixed grass prairie ecosystem. The Dougan property includes significant tracts of mixed grass prairie, which provides habitat to wildlife species of special concern in the Badlands. The conversion of the Great Plains for agriculture has severely limited habitat for many of these species that the park currently supports. For some of these species, such as the black-footed ferret, the park lacks adequate land to support and perpetuate the species.

Prairie. Most of Dougan property remains in a western wheatgrass native prairie community. Preserving an additional 4,000 acres of native prairie plant communities would be a significant outcome of NPS acquisition and management of the property.

Most rare plant species in the Badlands are found in uncommon or unique habitats associated with the Badlands erosional features and outcroppings. While there have been no surveys of the property, it is likely that the Badlands features on the property support rare plant species populations.

Black-footed Ferrets and Black-tailed Prairie Dogs. This property supports nine small prairie dog colonies totaling 116 acres. Two of these towns are within ½-mile of the largest prairie dog colony within the park, referred to as the Kocher Flats complex, which was a reintroduction site for the endangered black-footed ferret in 1997, 1998, and 1999. Wildborn black-footed ferrets in the park have been documented every year since releases began. With expansion of the ferret population on Kocher Flats, individual ferrets dispersed into smaller adjacent prairie dog colonies. Ferrets have been documented utilizing available prairie dog habitat on the Dougan property since 1999, with a minimum of two wildborn litters produced there since that time. However, the current owner advised the park that lethal control of prairie dogs was necessary for cattle range management. The landowner allowed

the Park Service to capture the ferrets and translocate them back into the park. Due to the topography of the area the Dougan property represents the only area for significant expansion of the Kocher Flats prairie dog complex and expansion of ferret habitat.

Prairie dog colonies provide den sites, escape cover, and prey for a variety of grassland wildlife species. Studies on the importance of prairie dog colonies to the grassland ecosystem, combined with range-wide eradication programs and loss of habitat, led to a recent petition to the U.S. Fish and Wildlife Service for listing the black-tailed prairie dog as threatened. The current status of this petition is that black-tailed prairie dogs are “warranted but precluded” from federal listing. Several western states, including South Dakota, are giving prairie dogs new management attention. Based on vegetation, soil, and slope characteristics, the Dougan property has the potential to support more prairie dog acreage than is currently present (because of control efforts). If the current prairie dog colonies (116 acres) on the Dougan property (4,500 acres) were allowed to expand to a minimum of 10% landscape coverage, it would support approximately 450 acres of prairie dogs. Density estimates of prairie dog colonies within Badlands National Park in 2002 were a mean of 19.4 prairie dogs/acre. These 450 acres of colonies on the Dougan property would thus support about 8,700 prairie dogs. The potential of prairie dog colonies to support black-footed ferrets at a given site is evaluated by the size of the colony, the proximity of the colony to other large colonies, and the density of prairie dogs on the colony. With the above scenario of 450 acres of prairie dogs on the Dougan property, there would be available habitat for five to six ferrets or one to two ferret family groups.

This potential ferret habitat would obviously increase with an increase in the acres of prairie dogs. It is realistic to expect that prairie dogs could expand to occupy 500 to 2,000 acres of the Dougan property. Under that scenario, and with similar densities as found within the park, up to 38,000 prairie dogs could populate the property, which could then support 20 to 24 ferrets or four to six ferret family groups dispersing out from Kocher Flats. Thus, addition of the property to the park would have significant positive impacts to the black-footed ferret population in the Conata Basin/Badlands Recovery Area.

Swift Fox. In the fall of 2003 the park began a swift fox restoration effort by releasing 30 wild fox from Colorado. All the fox were released in the park, along the northern boundary. Since release of the fox, telemetry has located fox outside the western side of the park, near the Dougan property. The property is good swift fox habitat and could be important to fox recovery in the Badlands area. With future releases planned, the National Park Service would release fox on the property if acquired.

Bison. Bison have been in Badlands National Park since 1963, when the reintroduced population numbered 53 animals. The present population is approximately 900 animals representing approximately $\frac{1}{3}$ to $\frac{1}{2}$ of the ecological carrying capacity of approximately 60,000 acres of the Badlands Wilderness Area and approximately 10,000 acres of nonwilderness prairie that constitutes the park’s bison range. One of the critical limiting factors to the park’s carrying capacity is the availability of water in the Sage Creek portion of the wilderness area. The Dougan property contains at least 15 additional water sources (stock ponds) beyond the western edge of the wilderness. These water sources would be easy to access and maintain because they are outside the wilderness and near improved

roads. Considering the addition of range and water resources, the park's bison herd could conservely increase to 1,000 to 1,500 with the purchase of this property.

Paleontological Resources. Badlands National Park was established because of its unique geologic landforms and impressive fossils. A report accompanying the park's enabling legislation describes the purpose of the monument as "to preserve the scenic and scientific values of a portion of the White River Badlands and to make them accessible for public enjoyment and inspiration." Also described were "vast beds of vertebrate fossil remains...which appear in great variety. The whole area is a vast storehouse of the biological past..."

Based on the geologic map created in 1976, the Brule Formation of the White River Group occurs throughout much of the Dougan property. It outcrops in a series of long sinuous banded ridges that form a boundary around the edge of the property.

Contained within the Brule Formation are 30 million-year-old fossil mammals, birds, and reptiles. For over 150 years, scientists throughout the world have come to western South Dakota to study these magnificent fossils. Both the rocks and fossils preserved within the White River Badlands provide important information about ancient climate and mammal evolution from 30 million years ago. It is likely tha such fossils exist in much of the Dougan property.

Because of the great significance of the fossils and geology, protection of the Dougan property directly adjacent to the park would be a great contribution to the scientific community. Additional fossil-rich areas would be made available to researchers studying paleontology and geology in the park.

Wilderness. Another pupose of Badlands National Park is to preserve the Badlands wilderness area and associated wilderness values. The Dougan property is adjacent to the western edge of the Badlands wilderness area. Currently the wilderness area is only accessible from Sage Creek campground on the north and Highway 44 on the south. This property also would provide additional access for visitors, which would enhance opportunities for the public to enjoy this part of the park. Due to the expansive vistas within the Badlands wilderness, any development on the Dougan property would be visible from much of the wilderness and would thus detract from those wilderness values related to untrammeled viewsheds. Acquisition by the Park Service would protect these viewsheds.

Criteria: *To address operational and management issues, such as the need for access or the need for the boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads.*

Access. The property provides critical access to the western portion of the Sage Creek Unit of the Badlands wilderness area. The current landowner has allowed NPS staff to access the wilderness through the property. If the property were sold it is possible that the National Park Service would no longer have access through it. This access has been critical to black-footed ferret reintroduction and monitoring in the Kocher Prairie Dog Town complex. NPS ownership of the property would ensure continued access to this complex.

The current landowner also has allowed NPS staff to access the park through the property to control weeds. Several Canada thistle infestations targeted for treatment are most easily accessed from this property. Loss of access would extend travel times for the responding crews, reducing the park's effectiveness in treating these populations.

Fire Management. The Dougan property allows some of the only access for wildland fire suppression and prescribed burning along the western boundary of the park. The current owner has been most accommodating in the past, granting access for managing prescribed burns on the western edge of the Badlands wilderness area. Access has also been critical for conducting prescribed fires in that portion of the wilderness. Access allows NPS crews into the wilderness boundary for holding fires within the park.

The NPS Fire Effects Monitoring team has also been granted access across the property to monitor post-burn vegetation plots. The water sources on Dougan's property would provide dip sites for helicopter buckets if a fire needed to be controlled in the wilderness area. Continued access across this property is very important to the success of the park fire management program.

Wilderness Management. The property provides critical access to the western portion of the Sage Creek Unit of the Badlands wilderness area. The current landowner has allowed NPS staff to access the wilderness through the property. Loss of access would increase travel times to for NPS staff working on wilderness management issues.

Criteria: The added lands will be feasible to administer, considering their size, configuration, ownership, and hazardous substances, costs, the views of and impacts on local communities and surrounding jurisdictions, and other factors such as presence of exotic species.

The recommended boundary addition would be feasible for the Park Service to manage and would not substantially add to the NPS workload to manage these lands. The added lands would create a block of land contiguous with the existing park boundary.

These lands are currently private lands and NPS acquisition would reduce local tax revenue for Pennington County. Payment in lieu of taxes would mitigate this impact. Acquisition of these lands has been discussed in public meetings, and local communities have not raised concerns about the loss of tax revenue or other impacts.

There are no known hazardous substance issues associated with the parcel, and appropriate hazardous material surveys would be conducted prior to acquisition.

Criteria: Other alternatives for management and resource protection have been considered and are not adequate.

The alternative to federal acquisition is the continuation of private ownership. The current landowner has been very cooperative in working with the National Park Service by providing access for management activities. The current land use has been primarily grazing, which has allowed the lands to remain relatively intact. However, this arrangement and cooperation could be lost if these lands are sold to another owner.

These properties are located in an area that has had limited interest by land conservation organizations. The Buffalo Gap National Grasslands has been acquiring lands in the area, but these have been through land exchanges that have focused on consolidating the lands the U.S. Forest Service manages. The current property owner is not interested in exchanging these lands for other lands currently being managed by the U.S. Forest Service. No other state or federal agencies have expressed an interest in protecting the resources on this property.

THE KUDNRA/ USFS PROPERTIES

Description of the Property

The proposed boundary change would seek congressional approval for an addition of approximately 5,400 acres to Badlands National Park in Pennington County, South Dakota. The property has access off Highway 44. Approximately 3,400 acres of these lands are currently owned by Kudnra family, local ranchers that manage the lands for cattle range. This private land includes a 160-acre inholding within the current authorized boundary of the park. The remaining approximately 2,000 acres are federal lands administered by the U.S. Forest Service. Both the private landowners and the Forest Service are agreeable to these lands being added to the park.

Criteria: To protect significant resources and values, or enhance opportunities for public enjoyment related to the purposes of the park

One of the purposes of Badlands National Park is to preserve the flora, fauna, and natural processes of the mixed grass prairie ecosystem. This property contains significant resources that make acquisition highly desirable for the National Park Service for furthering the purpose of Badlands National Park.

Prairie. Most of the Kudnra property remains in a native western wheatgrass prairie community, which is the dominant plant community in the region. Preserving an additional 3,400 acres of native prairie is a very desirable benefit of protecting the property. Also, most rare plant species in the Badlands are found in uncommon or unique habitats associated with badlands erosional features and outcroppings. While there have been no surveys of the Kudnra property, it is likely that its location at the base of the Badlands means that some of the area's rare plant species would be found there.

Black-footed Ferrets and Black-tailed Prairie Dogs. The land sits at the base of the Badlands Wall and on the western edge of the Conata Basin. The Conata Basin is the primary habitat for the only wild, self-sustaining, black-footed ferret population in existence. At this time the private landowner controls prairie dog populations, but if put in federal ownership, prairie dog town complexes could expand from U.S. Forest Service land in the basin, thus expanding available black-footed ferret habitat.

Prairie dog colonies provide den sites, escape cover, and prey for a variety of grassland wildlife species. Studies on the importance of prairie dog colonies to the grassland ecosystem, combined with range-wide eradication programs and loss of habitat, led to a recent petition to the U.S. Fish and Wildlife Service for listing the black-tailed prairie dog as threatened. The

current status of this petition is that black-tailed prairie dogs are “warranted but precluded” from federal listing. Several western states, including South Dakota, are giving prairie dogs new management attention. Based on vegetation, soil, and slope characteristics, the Kudnra property has the potential to support more prairie dogs acreage than is currently present (because of control efforts) and aiding in statewide prairie dog management.

Swift Fox. In the fall of 2003 the park began a swift fox restoration effort by releasing 30 wild fox from Colorado. All of the fox were released in the park along the northern boundary. However, since release telemetry has located several of the foxes utilizing the Conata Basin. The property is good swift fox habitat and could aid in fox recovery in the Badlands area. NPS ownership would ensure it remains good habitat (particularly by increasing prairie dog populations) and, with additional releases planned, the park would release fox on the property if acquired.

Bison. Bison have been in Badlands National Park since 1963, when the reintroduced population numbered 53 animals. The present population size is approximately 900 animals representing approximately 1/3 to 1/2 of the ecological carrying capacity of approximately 60,000 acres of the Badlands wilderness area and approximately 10,000 acres of nonwilderness prairie that constitutes the park’s bison range. One of the critical limiting factors to the park’s carrying capacity is the availability of water in the Sage Creek portion of the wilderness area. Addition of the Kudnra/USFS property would provide additional acreage and water sources for bison, allowing an increase to the herd by as many as 100 animals. Also, the property would allow for bison to roam up to Highway 44, which would provide visitors an important wildlife viewing experience from Highway 44.

Paleontological Resources. Badlands National Park was established because of its unique geologic landforms and impressive fossils. A report accompanying the park’s enabling legislation describes the purpose of the monument as “to preserve the scenic and scientific values of a portion of the White River Badlands and to make them accessible for public enjoyment and inspiration.” Also described were “vast beds of vertebrate fossil remains...which appear in great variety. The whole area is a vast storehouse of the biological past...”

These lands are very rich in fossils. This is the area where a unique paleontological find occurred — fossil Oreodont twin embryos that are now on display at the South Dakota School of Mines and Technology Museum of Geology. Because of the great significance of the fossils and geology in the area, protection of the property directly adjacent to the park would be a great contribution to the scientific community. Additional fossil-rich areas would be made available to researchers studying paleontology and geology in the park. Inclusion of the private lands in the park also places greater legal protection on these significant resources.

Wilderness. Another pupose of Badlands National Park is to preserve the Badlands wilderness area and associated wilderness values. This property is adjacent to the southwestern edge of the Badlands wilderness area. This property would provide additional access for visitors, which would enhance opportunities for the public to enjoy this part of the park. Due to the expansive vistas within the Badlands wilderness, any development on property would be visible from the wilderness and would thus detract from those wilderness

values related to untrammelled viewsheds. Acquisition by the NPS would protect these viewsheds.

Public Enjoyment. These lands would offer opportunities for visitors seeking solitude to explore remote scenic lands and view natural resources. .

Criteria: To address operational and management issues, such as the need for access or the need for the boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads.

Acquisition of this property would address operational and management issues relating to access. Acquisition of the property would move the boundary south to an existing road, Highway 44, which would guarantee access for resource management, resource protection.

Access. The property would provide the park with a southern public and administrative access to the Sage Creek Unit of the Badlands wilderness area from Highway 44.

With the southern access allowed by purchase of this property, research (particularly paleontological research) would greatly benefit from closer access to research sites.

Fire Management. Access would also aid in conducting prescribed fires in that portion of the wilderness. It would allow fire engines to drive to the wilderness boundary and enable hose lays and ATV access for holding the fire within the park.

Wilderness Management. The property provides critical access to the southern portion of the Badlands wilderness area. Acquiring these lands would reduce travel times to for NPS staff working on wilderness management issues.

Criteria: The added lands will be feasible to administer, considering their size, configuration, ownership, and hazardous substances, costs, the views of and impacts on local communities and surrounding jurisdictions, and other factors such as presence of exotic species.

The recommended boundary change would very feasible to manage. The addition would create a block of land contiguous with the existing park boundary. NPS staff could easily access the property from existing roads. The management of these additional lands would not substantially add to the NPS workload.

These lands are currently private lands and federal acquisition would reduce local tax revenue for Pennington County. Payment in lieu of taxes would mitigate this impact. Acquisition of these lands has been discussed in public meetings and local communities have not raised concerns about the loss of tax revenue or other impacts.

There are no known hazardous substance issues associated with the parcel, and appropriate hazardous material surveys would be conducted prior to acquisition.

Criteria: Other alternatives for management and resource protection have been considered and are not adequate.

The alternative to federal acquisition Kudnra property is the continuation of private ownership. The current landowner has been very cooperative in working with the National Park Service by providing access for management activities. The current land use has been primarily grazing which has allowed the lands to remain relatively intact. However, **this arrangement** and cooperation could be lost if these lands are sold to another owner.

The landowner is unwilling to sell the 160-acre inholding by itself. Therefore, the acquisition of the entire ranch offers the only reasonable opportunity to extinguish one of the few remaining tracts of private land subject to nonconforming uses within the authorized boundaries of the park.

These properties are located in an area that has had limited interest by land conservation organizations. The Buffalo Gap National Grasslands has been acquiring lands in the area, but these have been through land exchanges that have focused on consolidating the lands the U.S. Forest Service manages. The current property owner is not interested in exchanging these lands for other lands currently being managed by the U.S. Forest Service. No other state or federal agencies expressed an interest in protecting resource on the property.

The acquisition of the 2,000 acres currently administered by the USFS would be for operational efficiency, since these lands would be surrounded by park lands, and the USFS is attempting to consolidate lands. Discussions with the USFS have been positive concerning transferring management of these lands, if the private lands are acquired by the National Park Service.

THE PRAIRIE HOMESTEAD PROPERTY

Description of the Property

The property consists of 240 acres located at the northeast entrance to Badlands National Park in Jackson County, South Dakota, on Highway 240. The property is currently owned by the Crew family. The owner is willing to see the property added to the park.

The property includes the Ed and Alice Brown homestead comprising of 160 acres. The site consists of the original sod house, constructed in 1909, several outbuildings, and a modern, approximately 900-square-foot building, which includes an office, retail outlet, and museum. The Crew family has been operating the historic site as museum for over 40 years.

An associated 80-acre parcel also owned by the Crew family is proposed to be included in order to create a contiguous management unit that ties into the existing north boundary of the national park. A helicopter flight-seeing service, immediately adjacent to the northeast entrance station, is based on this tract. A fenced enclosure around the landing pad, a small (approximately 250 square feet) office/reception building, fuel storage tank, and storage shed are on this parcel.

Criteria: To protect significant resources and values, or enhance opportunities for public enjoyment related to the purposes of the park.

One of the purposes of Badlands National Park is to interpret the contemporary history of use and settlement of lands within the park. The sod house and associated furnishings and structures possess a high degree of integrity and direct connection to a pioneer family. The “soddy” is dug into the hillside, with a framed front and stacked sod partial walls and roof. Storage shed, chicken coop, root cellars and outhouse complete the district. The Homestead was placed on the National Register of Historic Places in 1974 as a state significant district.

Recent discussions with Steve Rogers of the State Historic Preservation Office (SHPO) have revealed that the homestead is a rare resource in the state of South Dakota as well as in the surrounding states. The SHPO considers the district to be very significant with good integrity.

The Badlands area of western South Dakota was settled relatively late in the homesteading era. The occasional year of plentiful rain and mild winters lured an ethnically diverse immigrant population to the region under the auspices of the Homestead Act – which allowed the granting of 160 acres to those who settled and met the criteria for improving the land. The 1929 Act authorizing Badlands National Monument contained a provision that the monument could be established at such time as a “satisfactory” amount of land had been transferred to the government without cost to the federal treasury. This was accomplished in 1939 by Presidential Proclamation. The land base that became Badlands National Monument derived from public lands acquired through the submarginal lands program of the Resettlement Administration brought about in response to the drought and depression of the 1930s. In 1936 Badlands National Monument boundary expansion was authorized as Title II of an amendment to the Taylor Grazing Act. Federal repurchasing of many homesteads during those dust bowl days eventually brought about the acquisition of sufficient private lands from homesteaders giving up on farming and leaving the area for more hospitable lands.

Badlands National Park currently lacks homestead-era structures with which to illustrate this significant part of the recent history of the region. The human history of the area, specifically the homesteading and agricultural use of the area, has been identified and recommended as an interpretive theme in park planning documents as early as 1947 and remains in the most recent plan completed in 1999. Homesteading in the Badlands, with the attendant harsh weather and rugged landform, molded the character of many families still tied to the area. This is the best preserved remaining homestead era sod home in South Dakota, is already a recognized interpretive site, and is within ¼-mile of the park along its primary entrance road.

Acquisition of the adjacent 80-acre parcel would require the relocation of the helicopter tour operation, thus reducing a noise source, traffic congestion, and the potential safety concerns associated with helicopter departures and landings next to the busiest entrance station in the park.

Another purpose of Badlands National Park is to protect the unique landforms and scenery of the White River Badlands for the benefit, education and inspiration of the public. The federal acquisition of the Crew Property will protect the viewshed of the White River Badlands. The Loop road (Highway 240), the main access to the park passes through these lands and offers impressive views of the Badlands as you approach the northeast entrance station. Acquisition

of these lands would be protect them from development and maintain an unobstructed views of the Badlands for the majority of visitors as they enter the park.

Criteria: The added lands will be feasible to administer, considering their size, configuration, ownership, and hazardous substances, costs, the views of and impacts on local communities and surrounding jurisdictions, and other factors such as presence of exotic species.

The recommended boundary change would be a feasible administrative unit, creating a contiguous block of land along a portion of Highway 240, the primary entrance to Badlands National Park from Interstate 90. The acquisition of the lands would not substantially increase the workload for the park staff. The maintenance of the Prairie Homestead would result in increase in operating cost to maintain the structures and staff the facility. These costs have been included in the cost of the alternatives presented on page 58.

These lands are currently private lands and federal acquisition would reduce local tax revenue for Jackson County. Payment in lieu of taxes would mitigate this impact. Acquisition of these lands has been discussed in public meetings, and local communities have not raised concerns about the loss of tax revenue or other impacts.

The property contains a potential hazardous material site, the fuel storage tanks associated with the commercial helicopter tour operation. Any contamination of soil is likely to be minor due to the storage tank's small size. This would be investigated further and remediated (if necessary) prior to acquisition.

Criteria: Other alternatives for management and resource protection have been considered and are not adequate.

The Crew family recognizes that they would not always be able to maintain and administer the site to ensure it is afforded adequate protection in the future. Mr. Crew, with the support of the senior senator from South Dakota, approached the National Park Service in 2001 and requested that the site be incorporated into the boundary of Badlands National Park.

The alternative to federal acquisition is the continuation of private ownership. There are no other federal or state agencies, museums, institutions, or foundations with an interest to preserve and interpret this historical property.

The acquisition has the support of the congressional delegation and the local community. The State Historic Preservation Office believes the National Park Service is the best steward for this property if the present owners relinquish ownership.

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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 sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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