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Theodore Roosevelt National Park
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Repair and Rehabilitate Scenic Drive
In the North Unit / Environmental Assessment / Assessment of Effect

July 2007

THEODORE ROOSEVELT NATIONAL PARK • NORTH DAKOTA

DRAFT

ENVIRONMENTAL ASSESSMENT

REPAIR AND REHABILITATE SCENIC DRIVE IN THE NORTH UNIT

July 2007

THEODORE ROOSEVELT NATIONAL PARK
McKenzie County, North Dakota
United States Department of the Interior • National Park Service

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CHAPTER 1: BACKGROUND

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The National Park Service, in cooperation with the Federal Highway Administration (FHWA), Central Federal Lands Highway Division (CFLHD), is proposing to repair and rehabilitate Scenic Drive in the North Unit of Theodore Roosevelt National Park, in McKenzie County, North Dakota. Figure 1 depicts the location of the North Unit.

The purpose of the proposed project is to rehabilitate and repair Scenic Drive to improve safety, visitor access, vehicular access, and drainage; minimize outfall erosion; and extend the useable life of the roadway.

Scenic Drive is in need of repair. Thermal cracking of the pavement is common. The roadway surface is damaged by rutting, potholes, and heaving. Some paved ditches have been damaged by vehicles pulling off of the roadway to park. Numerous culverts are corroded or separated and leaking. Slumping of side slopes threatens the roadbed in some locations. Subsurface water flow in a section of Cedar Canyon causes frequent subgrade failures, requiring repeated repairs.

The work would consist of resurfacing the roadway with asphalt pavement; installing, replacing, or relining culverts where necessary; cleaning roadside ditches; installing guardrail as needed; and stabilizing the banks of Squaw Creek adjacent to the Juniper Campground. An 850 foot long segment of the roadway in Cedar Canyon would be excavated and rebuilt, with under-drains installed to eliminate damage from water seepage. Parking areas and pedestrian walkways would be repaved and leveled to meet the standards required by the Americans with Disabilities Act (ADA) where feasible.

This environmental assessment (EA) has been prepared to analyze the impacts of the no- action alternative and the National Park Service preferred alternative. The EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500-1508; National Park Service Director's Order #12 and Handbook, "Conservation Planning, Environmental Impact Analysis, and Decision-making"*;* and Section 106 of the National Historic Preservation Act of 1966 as amended, and implementing regulations, 36 CFR Part 800. The NEPA process is being used to comply with Section 106.

PURPOSE AND SIGNIFICANCE OF THE PARK

Theodore Roosevelt National Park consists of three units in western North Dakota. The North Unit, with 24,070 acres, is in McKenzie County. Both the Elkhorn Ranch Unit, with 218 acres, and the South Unit, with 46,159 acres, are in Billings County. A central unifying feature of the park is the free flowing Little Missouri River, which flows through the North and South units and forms the eastern boundary of the Elkhorn Ranch Unit.

The park had its beginnings as Roosevelt Regional State Park in 1934. Public Law 38 (61 Stat. 52) established the area as Theodore Roosevelt National Memorial Park in April 1947. In June 1948 another Act (62 Stat. 352) added more land to the

park and corrected the description of the Elkhorn Ranch Unit lands. Also in June 1948, the Act (62 Stat. 384) added the North Unit to the park.
The Act of 24 March 1956 (70 Stat. 55) added lands on the north side of the town of Medora for park headquarters. The Act also authorized the Secretary of the Interior to make future boundary adjustments along U.S. 10 and U.S. 85. The Secretary adjusted the boundaries in 1963 to conform to the realignment of U.S. 10, now reconstructed and designated I-94.

The Act of 10 November 1978 designated the memorial park, Theodore Roosevelt National Park (PL 95-625, 92 Stat. 3467). It also designated 29,920 acres within the park as wilderness and authorized a boundary adjustment at the North Unit to add about 146 acres to the park and delete about 160 acres.

The Purposes of Theodore Roosevelt National Park

- Memorialize and pay tribute to Theodore Roosevelt for his enduring contributions to the conservation of our nation's resources.
- Conserve unimpaired the scenery and the natural and cultural resources, and facilitate the scientific interest in Theodore Roosevelt National Park.
- Provide for the benefit, use, and enjoyment of the people.
- Manage the Theodore Roosevelt Wilderness as part of the National Wilderness Preservation System.

The Significance of Theodore Roosevelt National Park

- The colorful North Dakota badlands provide the scenic backdrop to the park, which memorializes the 26th president for his enduring contributions to the conservation of our nation's resources.
- The park allows people to enjoy panoramic vistas and a sense of solitude, inspiration, and timelessness similar to Theodore Roosevelt's experience in the Dakota Territory in the 1880s. The area provides an opportunity to learn about an environment and way of life that helped shape Theodore Roosevelt's attitudes and philosophy regarding conservation.
- The Little Missouri River has shaped the land, which is home to a variety of prairie plants and animals, including bison, elk, bighorn sheep, and wild horses. A park experience is created by the interplay of natural forces, including weather, vegetation, wildlife, vistas, smells, color and shape of landforms, air quality, varied light, and seasons.
- Ongoing geological activities create spectacular examples of badlands and provide opportunities for visual interpretation of erosion processes.
- The park contains one of the few islands of designated wilderness in the northern Great Plains.
- The park is designated as a Class I air quality area, providing for clean air; brilliant, clear day and night skies; and outstanding examples of a relatively unpolluted environment.
- The park has one of the largest petrified forests in the United States and extensive paleontological deposits from the Paleocene epoch that provide outstanding examples for visitor viewing.

The Mission Statement for Theodore Roosevelt National Park

> Theodore Roosevelt National Park diligently protects and preserves the natural scene and the cultural landscape, and provides the opportunity to understand and appreciate the rugged Little Missouri badlands topography, with its unique flora and fauna, which inspired Theodore Roosevelt in the 1880s. The park projects the spirit of Roosevelt's conservation ethic and his enthusiasm for the natural world. Discovery of this unique and outstanding unit of the National Park System will create a sense of surprise and wonderment that will lead to an understanding of the role of humankind as an integral part of nature.

The June 1987 *General Management Plan/ Development Concept Plans, Theodore Roosevelt National Park* describes park management constraints, and summarizes the zoning and management procedures considered necessary to address park resource protection issues and concerns.

PREVIOUS PLANNING

The 1973 *Master Plan* identified management zones throughout the park. It also mentioned the need for paving the North Unit drive, now known as Scenic Drive, throughout its entire length, and for constructing various new paved observation point parking areas.

The 1987 *General Management Plan* does not identify maintenance needs for Scenic Drive specifically, but discusses the need for repaving road surfaces and improving drainage along road corridors throughout the park.

SCOPING

Internal Scoping

Internal scoping is an integral part of NPS projects. The project team includes park staff and NPS staff from the Denver Service Center (DSC), and Central Federal Lands Highway Division staff from Lakewood, Colorado. In September 2005 the project team met at park headquarters in Medora, North Dakota to discuss potential alternatives for repairing and rehabilitating Scenic Drive and identify related issues.

External Scoping

The NPS consulted with the U.S. Fish and Wildlife Service (USFWS) about known federal threatened or endangered species or state species of concern within the proposed project area. On January 4, 2007 the park sent a consultation letter to the USFWS offices in Bismarck, North Dakota. The USFWS replied by letter on January 19, 2007, advising that they are not aware of any listed or endangered species in the proposed project area.

The NPS also consulted with the State Historical Society of North Dakota in Bismarck, North Dakota by letter in January 2007, to ensure that the requirements of Section 106 of the National Historic Preservation Act were properly addressed. The Historical Society indicated by letter February 8, 2007 that staff will review the environmental assessment to determine what the potential effects might be to the cultural and historical resources of the park.

On November 27, and December 12, 2006 the NPS mailed letters to the Natural

Figure 1. General Location Map

Figure 1

General Location North Unit

Theodore Roosevelt National Park

United States Department of the Interior
National Park Service

Resources Conservation Service (NRCS) in Bismarck, North Dakota, to determine potential impacts to prime or unique farmlands or lands of statewide or local importance. The NRCS advised in a telephone conversation on January 23, 2007 that they would consider any impacts to such lands to be negligible.

On November 2, 2006, a letter to the public was posted on the internet at http://parkplanning.nps.gov, announcing that an environmental assessment for the proposed repair and rehabilitation of Scenic Drive was being prepared. The letter solicited comments on the proposal from the public. No comments were received.

ISSUES

Issues and concerns affecting this proposal were identified through internal scoping, through previous NPS planning efforts, and through input from state and federal agencies. Concerns include potential impacts to:

Invasive Exotic Plants

Theodore Roosevelt National Park represents some of the most pristine native grasslands in North Dakota, so it is imperative that the genetic integrity of plants in the park be preserved and protected. Disturbance of soils during construction would provide opportunities for the establishment and spread of invasive exotic plants.

Wetlands

Construction efforts during repair and rehabilitation of Scenic Drive could impact wetlands.

Historic Structures

A number of historic stone culvert headwalls and endwalls constructed by the Civilian Conservation Corps (CCC) from 1934 to 1941 could be impacted by implementation of either of the two alternatives discussed in this EA.

Visitor Use and Experience

Both of the alternatives would affect visitor use and experience, because of road quality and the effects of road maintenance activities during visits to the park.

Park Operations and Management

Both of the alternatives would affect park operations and management, because of their effects on road maintenance and accessibility on Scenic Drive.

Resources were considered in accordance with NPS *Management Policies 2006*. The NPS manages park resources to maintain them in an unimpaired condition for future generations in accordance with federal laws and regulations. NPS specific statutes include the Organic Act of 1916 and the National Parks Omnibus Management Act of 1998. General environmental and related laws include the Clean Air Act; the Clean Water Act; the Endangered Species Act of 1973; the National Environmental Policy Act of 1969, as amended; and the National Historic Preservation Act of 1966.

IMPACT TOPICS

Specific impact topics were developed to focus the analysis and to allow comparison of the environmental consequences of each alternative. Issues that warrant analysis were identified by NPS staff during the scoping process. The public did not identify any additional issues during public scoping. Impact topics were then identified for detailed analysis based on federal laws, regulations, and executive orders; NPS *Management Policies 2006*; and NPS knowledge of resources that are limited or could be easily impacted. A brief rationale

for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

Impact Topics Analyzed in Detail

Invasive Exotic Plants

Implementation of the preferred alternative could contribute to the spread of invasive exotic plants throughout the length of Scenic Drive. Theodore Roosevelt National Park represents some of the most pristine native grasslands in North Dakota, so it is imperative that the genetic integrity be preserved and protected. Invasion by exotic species has been identified second only to habitat loss as a threat to biodiversity nationwide. In addition, introduction of these species is perhaps the most permanent and unrecoverable blow to native biodiversity and ecosystem processes/integrity.

Invasive species are especially problematic in areas that have been disturbed by human activities such as road building. Areas in which soils would be most disturbed by construction activities, such as on roadside slopes in Cedar Canyon and along the paths at the River Bend Overlook and the Oxbow Overlook, would be especially susceptible to infestation by exotic plants. Therefore, invasive exotic plants is an impact topic that is discussed in detail in this EA.

Wetlands

Implementation of the preferred alternative could impact wetlands in Cedar Canyon in close proximity to Scenic Drive, and could impact wetlands in Squaw Creek. Therefore, wetlands is an impact topic that is discussed in detail in this EA.

Historic Structures

In 1966 Theodore Roosevelt National Memorial Park was listed in the National Register of Historic Places. In 1978 Congress changed the unit designation to Theodore Roosevelt National Park. In 1982, at the request of the park, Theodore Roosevelt National Park was removed from the National Register. The park is now preparing to nominate Scenic Drive in the park's North Unit for listing in the national register. Fourteen historic stone culvert headwalls and endwalls constructed by the CCC in the late 1930s will be identified as contributing features.

Both alternatives discussed in this EA would impact the stone headwalls and endwalls. Therefore historic structures is an impact topic discussed in detail in this EA.

Visitor Use and Experience

Both the no-action alternative and the preferred alternative would affect visitor use and experience. Repair and maintenance activities resulting from either of the alternatives would affect vehicular access and impact the visitors' experience of the park's natural scenery and sounds. Therefore, visitor use and experience is an impact topic that is analyzed in detail in this EA.

Park Operations and Management

Park operations and management would be affected by implementation of either the no-action alternative or the preferred alternative (alternative B). Either alternative would require repair, and maintenance activities on Scenic Drive. Therefore, park operations and management is an impact topic that is analyzed in detail in this EA.

Impact Topics Dismissed From Further Analysis

Archeological Resources

The proposed project currently bisects four archeological sites and is within 25 feet of

two other sites. Those six sites were recorded by an NPS archeologist, Ralph Hartley, in 1979-80 (NPS 1981) and filed with the North Dakota State Historic Preservation Office. The four sites that are bisected by the road would require mitigation measures in case there are inadvertent discoveries or site boundary changes discovered during the road construction.

Because the four bisected sites were previously disturbed during the original road construction, and there are no proposed roadway realignments in the four locations, there would be no impacts to the sites. Therefore, archeological resources are dismissed from additional analysis in this document.

Cultural Landscapes

According to the Director's Order # 28, "Cultural Resource Management Guideline," a cultural landscape is

> ". . . a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined by both physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values."

The NPS staff has not identified any cultural landscapes within the area of potential effect. Therefore, there is no effect on cultural landscapes, and this impact topic is dismissed from further analysis.

Ethnographic Resources

Ethnographic resources are defined in Director's Order #28 as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it."

The park's affiliated tribes have not identified any tribal ethnographic resources that would be adversely affected in the proposed project's area of potential effect. Therefore, there would be no effect on ethnographic resources, and this impact topic is dismissed from further analysis. The tribes will be provided with public review copies of this EA. This topic would be revisited if new information becomes available as a result of that review.

Museum Objects

The only additional museum objects that would be created during the proposed project are the final Environmental Assessment and the NEPA and Section 106 decision document. These two documents would be entered into the NPS Automated National Catalog System as archives. The impact to museum objects would be negligible, local, short and long-term. Therefore, museum objects are dismissed as an impact topic.

Soundscapes

In accordance with *Management Policies 2006* and *Director's Order 47 – Sound Preservation and Noise Management*, an important component of the National Park Service's mission is the preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in a park unit, together with the physical capacity for transmitting natural sounds.

Generally, ambient noise levels in the project vicinity are low and are dominated

by natural sounds. Natural sounds in the project area include the sounds of wind, running water, birds, and occasionally other animal sounds.

Vehicle traffic is the main source of human-caused noise in the project area. Although roadway speeds are low, visitor traffic intermittently increases noise levels, particularly during the summer months when traffic levels are higher. Noise is also produced during road maintenance activities. Summer is the busiest season for road maintenance. Because of weather limitations, part of the construction work for the proposed project would occur during the summer.

Actual ambient sound levels along Scenic Drive are not known, but as a frame of reference, the sound level on a totally quiet night in a desert would be around 30 decibels (dBA), while sound levels from light traffic on paved roads range from 45 to 50 dBA at a distance of 100 feet from the roadway.

Typical sound levels from road construction equipment such as trucks, front loaders, pavers, dozers, and graders can be in the range of 63 to 94 dBA at a distance of 100 feet from the sound source.

Noise levels decrease at a rate of approximately 6 dBA per doubling of distance from a noise source. The rate of decrease is also dependent upon topography and weather conditions.

With either alternative discussed in this EA human-caused noise would intrude upon the natural soundscape, caused by visitors and their vehicles, as well as by park maintenance activities. The preferred alternative would result in more construction noise than the no action alternative between the years 2008 and 2015. Due to extreme weather conditions in the winter months, the majority of construction noise would occur from April to October. Effects to the natural soundscape during daylight hours would be clearly detectable, localized, and periodic. Because elevated noise levels would be localized, would decrease with distance, and would occur only during daylight hours, the anticipated impact would be minor. The adverse impacts would be relatively short term. Therefore soundscapes is dismissed as an impact topic.

Air Quality

Air quality became a national concern in the mid-1960s, leading to the passage of the Air Quality Act in 1967. The Act (now referred to as the Clean Air Act) and subsequent amendments have established criteria and procedures for improving conditions, including a set of National Ambient Air Quality Standards. The U.S. Environmental Protection Agency is directed to set levels for pollutants in order to protect the public health. The National Ambient Air Quality Standards are adopted for six pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead. A system of monitoring stations is established across the country to measure progress in meeting these goals. If an area is found to have pollutants in excess of the allowable concentrations, local officials are required to develop a plan for achieving air quality that meets the standards.

Air quality in the vicinity of the park is very good. The North Dakota Department of Health, Division of Air Quality, maintains 10 continuous air quality monitoring sites in the western half of the state. There are two monitoring sites in McKenzie County: one in the North Unit of Theodore Roosevelt National Park, and one at the Bear Paw Energy natural gas

collection facility west of the park at the Montana state boundary. The *State/Industry Ambient Monitoring Network Air Quality Report, 2nd Quarter 2006*, prepared by the Division of Air Quality, reported no instances where state or federal air quality pollution standards were exceeded.

Should the preferred alternative be implemented, local air quality would be temporarily affected by dust and vehicle emissions associated with construction. Hauling material and operating equipment during the construction period would result in increased vehicle exhaust and emissions. However, hydrocarbon, nitrogen oxide, and sulfur dioxide emissions would be rapidly dissipated by air drainage.

Fugitive dust plumes from construction equipment would intermittently increase airborne particulates in the area near the project site, but loading rates are not expected to be appreciable. To reduce these effects, such activity would be coupled with water sprinkling to reduce dust.

It is not anticipated that vehicle traffic would increase as a result of either the no-action alternative or preferred alternative. Consequently, air quality in the general area would be unchanged in the long term.

Overall, there would be a negligible temporary degradation of local air quality due to dust generated from construction activities and emissions from construction equipment. These effects would last only as long as construction occurred. The area's air quality would not be expected to experience an increase in long term adverse effects because of the proposed project. Therefore, air quality is not analyzed in detail in this document.

Water Quality

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251 et seq.), is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; to enhance the quality of water resources; and to prevent, control, and abate water pollution. Section 401 of the Clean Water Act requires a permit for any activity which may result in any discharge into the navigable waters of the United States. Section 404 of the Clean Water Act requires a permit for any activity which may result in the discharge of dredged or fill material into navigable waters, including wetlands. NPS *Management Policies* provides direction for the preservation, use, and quality of water in national park units.

It is anticipated that the no-action alternative would have no impacts on ground water. Impacts to surface water quality from the no-action alternative would be long-term and minor, caused by continuation of erosion of the banks of Squaw Creek in the vicinity of the Juniper Campground, and in other areas of the roadside. Rain events and intermittent high flows would continue to wash soil into Squaw Creek and the Little Missouri River.

It is anticipated that the preferred alternative would have a short term minor adverse impact on the quality of subsurface flows along an 800-foot-long segment of Cedar Canyon. The road base in that area would be excavated and subsurface drains would be installed to collect seepage water that flows beneath the road. The construction work would temporarily increase the turbidity of water flowing from the roadway, but after drain installation was complete water quality

would return to its original level. There would be no long term impact to water quality, and there would be no short term impact to water quality beyond that 800-foot-long segment of Cedar Canyon.

It is anticipated that the preferred alternative would have short-term minor adverse impacts on surface water quality. If the preferred alternative were implemented, stone riprap or gabions would be placed in Squaw Creek and along its banks just upstream from the Juniper Campground. That would eliminate the erosion of those sections of stream bank and reduce adverse impacts to water quality. A Section 404 permit would be required if riprap or gabions were placed along the creek. Construction activities during placement of the riprap would briefly increase the turbidity of the water in the creek, but that short-term impact to water quality would be minor. With the implementation of erosion and sediment control measures, it is anticipated that impacts to water quality would be restricted to that segment of Scenic Drive.

Impacts to water quality from either alternative would be no greater than minor, and short term only. Therefore, water quality is not analyzed in detail in this EA.

Floodplains

Executive Order 11988, "Floodplain Management," requires an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. NPS *Management Policies 2006*, Director's Order #77-2, "Floodplain Management," and Director's Order #12, "Conservation Planning, Environmental Impact Analysis, and Decision-making," provide guidelines for proposals in floodplains. NPS *Management Policies 2006* provides direction for the preservation, use, and quality of water in national parks.

Impacts to floodplains from either alternative would be negligible. To protect the integrity of the Squaw Creek bridge, both the no action alternative and the preferred alternative would include repair of eroded stream banks at the bridge. With either alternative the eroded stream banks would be rebuilt with soil and armored with riprap or gabions. The stream banks would be reconstructed to original grade, and there would be very little if any change to the values and functions of the Squaw Creek floodplain or in the ability of that floodplain to convey floodwaters. Neither alternative would contribute to flooding from Squaw Creek.

The Little Missouri River flows to within approximately a quarter of a mile of Scenic Drive. Some culverts associated with Scenic Drive cross the Little Missouri River floodplain and discharge directly into the river. Erosion around some of those culverts would be repaired with soil from the surrounding area. There would be no change to the values and functions of the Little Missouri River floodplain or in the ability of the floodplain to convey floodwaters. Neither alternative would contribute to flooding from the river. Because there would be little or no impact to floodplains, preparation of a floodplain statement of findings will not be required for this project.

There are no floodplains other than Squaw Creek and the Little Missouri River within the project area. Because impacts from either alternative would be no greater than negligible, floodplains are not analyzed in detail in this EA.

Prime or Unique Farmland

In 1980, the Council on Environmental Quality directed federal agencies to assess the effects of their actions on farmland soils classified as prime or unique by the United States Department of Agriculture, Natural Resources Conservation Service. Prime farmland is defined as soil, which has the best combination of physical and chemical properties to produce general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts.

The state soil liaison for the Natural Resources Conservation Service (NRCS) in Bismarck, North Dakota, advised in a telephone conversation on January 23, 2007 that the proposed project would impact no more than 0.08 acre of land identified as prime farmland, and that the NRCS would consider such an impact to be no greater than negligible. Therefore, prime or unique farmland is not analyzed in detail in this EA.

Soils

NPS *Management Policies 2006* requires protection of park resources, including soils, to protect parks' scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them. The National Environmental Policy Act of 1969 calls for an examination of impacts on all components of affected ecosystems.

Under the preferred alternative, disturbances would occur through excavation, stockpiling, windrowing, and redistribution of soils along approximately 800 feet of Scenic Drive roadway through Cedar Canyon. The subgrade there would be excavated and replaced with new material, and a new drainage system would be installed.

Additionally, the existing trail from the River Bend overlook parking area would be re-graded to provide an accessible ADA route to the existing wayside platform. At the Oxbow overlook the parking area would be expanded to accommodate ADA parking and an ADA accessible route to the scenic overlook.

Under the preferred alternative the Cannonball Concretions, Long X Trail and Caprock Coulee Trail parking areas would be redesigned to accommodate ADA parking and new wayside exhibits.

Areas of disturbance would be relatively small. The total estimated area of disturbance is 23.5 acres. Of that, approximately 0.5 acre would have long term impacts and 23 acres would have short term impacts. Areas in which new pavement would be placed would be those with long term impacts. Areas that would be revegetated would experience short term impacts. Short term impacts would include the temporary stockpiling of topsoil and the potential for erosion.

Erosion control measures incorporated in the proposed action would include best management practices for drainage and sediment control. The proposed action includes the mitigation measures described below, to reduce impacts to soils.

- Keep disturbed areas as small as practical to minimize exposed soil and the potential for erosion.
- Locate waste and excess excavated materials outside of drainages to avoid sedimentation.
- Revegetate disturbed areas as soon as possible after construction is completed.
- Pull back topsoil removed during construction and stockpile it in windrows no more than 3 feet high

along the roadway, so that it can be pulled back when road paving is completed. That topsoil management would be supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area.

Mitigation measures would be relatively simple to implement, and remaining adverse impacts would be minor. In accordance with the North Dakota Pollutant Discharge Elimination System, a Storm Water Pollution Plan would be prepared for the proposed project. Because impacts would be no greater than minor, soils are not analyzed in detail in this EA.

Designated Critical Habitat, Ecologically Critical Areas, Wild and Scenic Rivers, and Other Unique Natural Areas

No areas within the project corridor are designated as critical habitat or ecologically critical. The section of the Little Missouri River flowing through the North Unit is eligible for listing as a wild and scenic river, though it is not listed at present. It is identified on the Nationwide Rivers Inventory prepared by the NPS because of its unaltered condition and outstanding scenic, historic, and recreational values, and because of its value as fish and wildlife habitat. Virtually all of the North Unit, outside of road corridors and aside from areas with buildings, is designated as wilderness.

Neither of the proposed alternatives would adversely affect the condition of the river or its resource values, or the wilderness areas of the park. Impacts would largely be confined to the road corridor. Therefore, designated critical habitat, ecologically critical areas, wild and scenic rivers, and other unique natural areas are not analyzed in detail in this EA.

Threatened and Endangered Species

The Endangered Species Act (1973), as amended, requires an examination of impacts on all federally-listed threatened or endangered species. National Park Service policy also requires examination of the impacts on federal candidate species, as well as threatened, endangered, candidate, rare, declining, and sensitive species that are listed by the state.

The NPS conferred with the U.S. Fish and Wildlife Service (USFWS) about potential adverse impacts on threatened and endangered species. A letter from the USFWS was received by the park on January 19, 2007. The letter indicated that the USFWS has no objection to the project as proposed, provided that NPS implements precautions to minimize impacts to native grasslands, woodlands, and aquatic resources. The USFWS letter is included with this EA in Appendix A.

The USFWS letter identified the whooping crane, the interior least tern, pallid sturgeon, black-footed ferret, gray wolf, bald eagle, and piping plover as threatened or endangered species found in McKenzie County. The proposed project would not impact the habitat preferred or required by the whooping crane, tern, sturgeon, ferret, or plover. The USFWS letter indicated that the wolf and bald eagle may occasionally visit or migrate through the area, but they are not known to inhabit the North Unit of the park.

Park staff reviewed the USFWS letter and indicated that the needed precautions would be implemented and that impacts to federally- listed species or state species of conservation priority would be no greater than negligible. Therefore, impacts to

threatened or endangered species will not be analyzed in detail in this EA.

Wildlife

The NPS Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the agency to mean that native animal life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise they are protected from harm by human activities. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of plants and animals.

Neither of the alternatives would impact the overall abundance, diversity, or ecological integrity of animals, nor inhibit the processes of park ecosystems. Approximately 6 acres of native wildlife habitat would be adversely affected throughout the 14-mile length of Scenic Drive. A 50 foot long trail would be built through native habitat at the Oxbow overlook, and an existing trail through native habitat at the River Bend overlook would be widened. Some parking areas would be expanded onto areas now supporting native habitat. Those impacts would be measurable, but they would not affect native species' populations or the natural processes sustaining them beyond their natural range of variability. Mitigation measures, such as replanting disturbed areas with native vegetation, would be in accordance with conventional best management practices, and would have a high likelihood of success. The long term adverse impact to wildlife would be minor. Therefore, impacts to wildlife are not analyzed in detail in this EA.

Environmental Justice

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. All communities and populations in the project area would be equally affected by the condition of Scenic Drive and by any repair or rehabilitation activities on that road. Neither one of the alternatives would have disproportionately high adverse health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's *Draft Environmental Justice Guidance* (July 1996). Therefore, environmental justice is not analyzed in detail in this EA.

Indian Trust Resources

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

None of the land in Theodore Roosevelt National Park is held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources are not analyzed in detail in this EA.

Socioeconomic Environment, including Land Use

The no-action alternative would have a continuing beneficial impact on the socioeconomic environment. The park would continue the current practice of periodically purchasing road repair services and materials as needed to maintain Scenic Drive.

The preferred alternative would have a beneficial short term impact on the economies of nearby counties and other municipalities. There would be limited increases in employment opportunities for the road construction work force and revenues for local businesses and government generated from construction activities and workers. Any increase would be beneficial locally, and short term in duration, lasting only as long as the construction period.

The alternatives considered would not change land use in the wider surrounding region, as the project would not appreciably alter the character or capacity of the road. Because the impact would be no greater than negligible, impacts on the socioeconomic environment, including land use, are not analyzed in detail in this environmental assessment.

CHAPTER 2: THE ALTERNATIVES

INTRODUCTION

This chapter describes two alternatives for Scenic Drive: the no-action alternative and the preferred alternative. The purpose of the no-action alternative is to provide a basis for comparing the actions and environmental consequences of the preferred alternative.

The no-action alternative would continue the existing maintenance practice of repairing road damage as necessary. The preferred alternative discussed in this EA is to repair and rehabilitate Scenic Drive throughout its 14-mile length. The entire route of Scenic Drive is depicted in Figure 2.

ALTERNATIVE A, THE NO-ACTION ALTERNATIVE: CONTINUE ONGOING MAINTENANCE AND REPAIRS

The no-action alternative consists of the park's ongoing routine of maintenance and repairs. It does not imply or direct discontinuing day-to-day maintenance and repairs. The park would continue to clear culverts, stabilize slopes, patch potholes, and complete other isolated repairs as the need arises. The road would continue to deteriorate, and repair costs would continue to escalate. Temporary road closures for repairs would become more frequent. Should the no-action alternative be selected, the NPS would respond to future needs and conditions without major actions or changes in the present course.

ALTERNATIVE B, THE PREFERRED ALTERNATIVE: REPAIR AND REHABILITATE SCENIC DRIVE

Scenic Drive would be rehabilitated and repaved throughout its 14-mile length. Cut and fill slope erosion and slumping alongside the roadway would be repaired as needed. Vegetated areas disturbed by construction activities would be revegetated with native plants and seeds. Existing wooden exhibits throughout the park would be replaced by NPS standard wayside panels and uprights

Damaged and deteriorating culverts (historic and non-historic) would be replaced, and new culverts would be installed where needed. Up to three stone masonry features would be rehabilitated, and twelve other stone culvert features would be rebuilt. All masonry stone rehabilitation would be in accordance with the *Secretary of the Interior's Standards for the Preservation of Historic Properties*. Stone riprap would be placed at culvert outlets as needed.

An 800-foot section of the roadway in Cedar Canyon would be excavated and underlain with drainage pipes before being repaved. The banks of Squaw Creek in the vicinity of the Juniper Campground would be armored with riprap rock or gabions.

In the vicinity of the River Bend overlook an 850-foot-long section of roadway would be stabilized to prevent slumping.

The visitor center parking area and parking areas and pullouts along Scenic Drive would be reconstructed where needed to meet ADA accessibility standards where feasible. Some improvements would be common to all of the pullouts along Scenic Drive: existing curbs and sidewalks, including accessible ramps, would be reconstructed using concrete of neutral earth tone color; parking spaces would meet ADA accessibility standards; and parking spaces would be designated using ADA standard pavement striping.

Several parking areas would require some additional expansion and reconfiguration. An ADA accessible ramp from the parking lot to the sidewalk in front of the visitor center would be relocated to meet incline grade requirements.

An ADA parking space would be added to the Cannonball Concretions parking lot, with no net loss in the current number of parking spaces. One RV/bus parking space would be added by reducing the striped island alongside the large vehicle parking spaces.

The Long X Trail parking area would be reconfigured to provide two entrance/exit routes rather than the existing single entrance/exit route; this would improve the sight distance for vehicles leaving and approaching the parking area and would also provide an adequate turning radius for RV/buses. A portion of the existing interior island would be paved and some of the existing paved areas would be reclaimed into an expanded vegetated island between the roadway and the parking area.

The Caprock Coulee Trail parking area would be expanded by approximately 20 feet, to provide an additional ADA parking space. Some re-grading would be done to ensure compliance with ADA requirements.

The River Bend Overlook parking area would be improved to provide ADA access to the viewing deck. The trail would remain within the existing footprint, with minor modifications to the overall profile grade. It would be surfaced with a material that meets ADA standards.

At the Man and Grass pullout and the Edge of Glacier pullout, the existing unpaved islands (approximately 5 feet wide and 120 feet long) between the roadway and the pullouts would be paved. The parking areas at both pullouts would be reconfigured to head-in parking. .

The Oxbow Overlook parking area would be improved to provide a parallel ADA parking space close to the existing trail to the overlook. The existing trail, including the overlook area, would be reconstructed to meet ADA standards.

Construction Management

Individual pullouts and sections of larger parking areas would be closed as needed during construction/rehabilitation work there.

To accommodate visitor needs, no construction work would be allowed during holidays.

During rehabilitation of most of the roadway a single lane would be closed through the construction zones. Signage and flaggers would direct traffic through the construction zones.

For the complete reconstruction of the segments of the roadway in Cedar Canyon and in the vicinity of the River Bend Overlook, the road would be completely closed west of the Caprock Coulee Trail pullout. Closure would be after the Labor Day weekend.

Staging Area

Construction staging areas for repairing and rehabilitating Scenic Drive would be located in the existing pullouts and another area referred to as the “mix pit.” The pullouts are well spaced along the length of Scenic Drive for staging equipment and materials.

The mix pit is approximately one mile south of Scenic Drive near milepost 2.7, and is accessed by a gravel road. Materials for park use are commonly stored there now. The area has been disturbed by park vehicles and

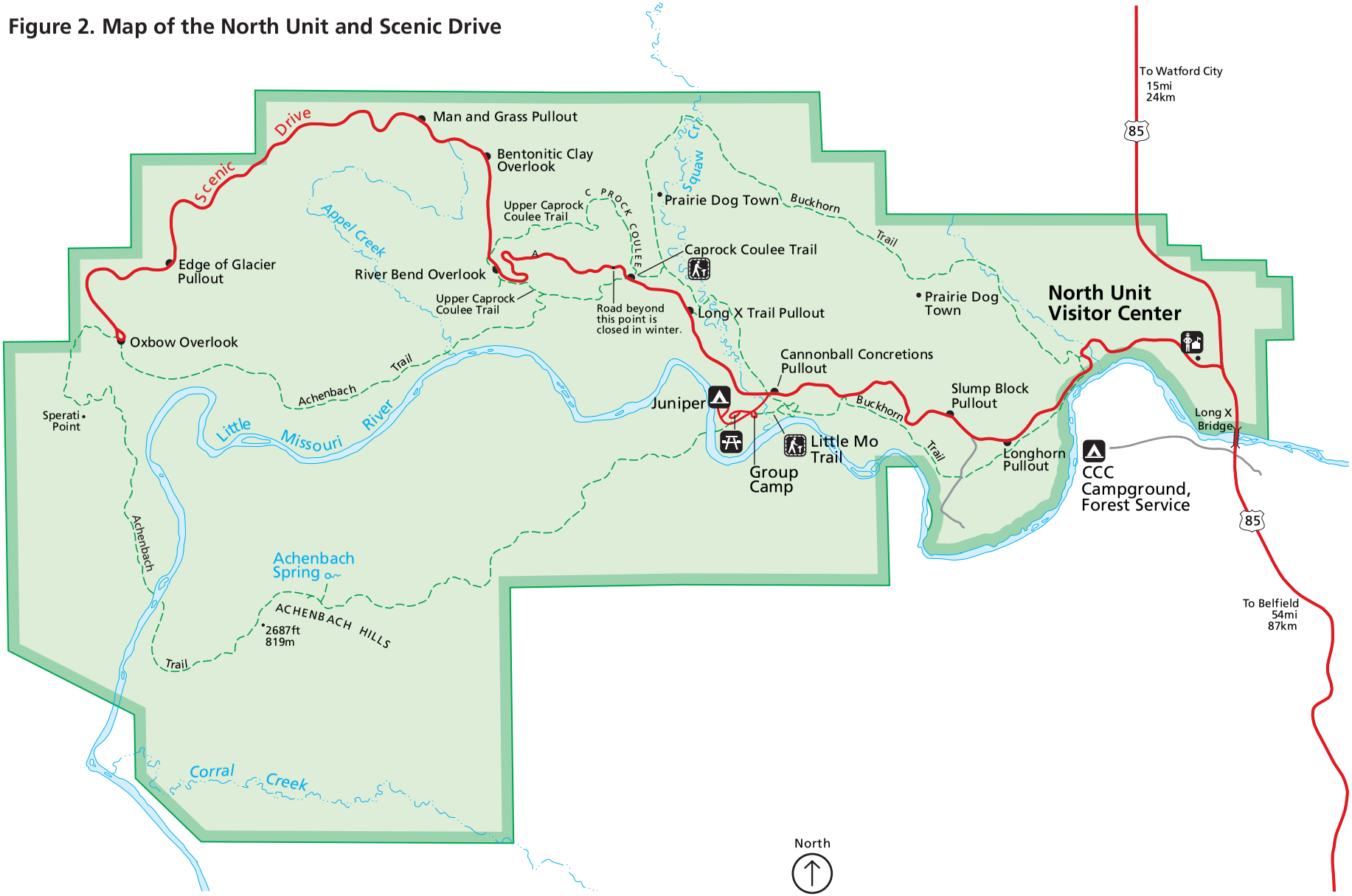
has been used as a construction staging area in the past.

General Construction Schedule and Costs

It is anticipated that the repair and rehabilitation of Scenic Drive would be accomplished in phases between 2008 and 2015, to accommodate funding allocations. The most urgent repair work, such as the rehabilitation and reconstruction of the damaged sections of roadway in Cedar Canyon and in the vicinity of River Bend Overlook, would be completed during the late summer and early fall of 2008. Construction work would occur during the summer and fall period.

It is anticipated that the total cost of the repair and rehabilitation of Scenic Drive would be approximately $16 million.

Figure 2. Map of the North Unit and Scenic Drive



Off-road driving is prohibited in both park units.

Unpaved road
Overlook or pullout
Trail
Ranger station
Picnic area
Campground
Private Campground
Self-guiding nature trail
Parking

Figure 2

North Unit and Scenic Drive

Theodore Roosevelt National Park

United States Department of the Interior
National Park Service

MITIGATION MEASURES OF THE PREFERRED ALTERNATIVE

Mitigation measures have been developed to reduce or eliminate the adverse effects of the preferred alternative. Table 1 explains the proposed mitigation measures.

Table 1. Mitigation Measures of the Preferred Alternative

Resource Area	Mitigation Measure
Air Quality	Fugitive dust would be controlled by periodic water sprinkling, by minimizing soil disturbance, and revegetating disturbed soil areas as soon as feasible following construction.
Soils	In accordance with North Dakota Pollutant Discharge Elimination System requirements, the Federal Highway Administration would prepare a storm water pollution prevention plan. The plan would include sustainable best management practices to control storm water runoff: Soil compaction and disturbance would be kept to a minimal amount of space needed for construction activities. Appropriate sediment and erosion control measures, such as silt fence and inlet protection, would be implemented to reduce soil erosion and runoff from the construction area. Disturbed soils would be revegetated and protected with weed free fiber mats or straw mulch.
	Topsoil removed from areas of construction would be stockpiled for later reclamation use. After construction in an area was complete, the topsoil would be spread in as near the original location as feasible in the construction zone and supplemented with scarification, mulching, seeding, and/or planting with species native to the park.
Vegetation (Including Invasive Exotic Plants)	A revegetation plan would be developed and implemented to restore disturbed areas. Revegetation success would be monitored by park staff for two years following construction. Remedial and control measures, such as replanting and herbicide treatments, would be implemented as needed. When construction area limits are delineated but prior to earth moving activities, park staff would temporarily transplant selected native plants. The plants would be replanted on site after construction, or used for restoration projects elsewhere in the park.
	Ground surface treatment would include grading to natural contours, topsoil replacement, seeding, and planting. This work would occur as soon after the completion of construction as practicable.

Resource Area	Mitigation Measure
	Any sources of imported fill, gravel, and topsoil would be identified, inspected, and approved prior to such material being transported into the park.
	All construction activities would be limited to designated areas. No activities, including vehicle and material use and storage, would be allowed outside predetermined marked construction areas.
	Staging and stockpile sites within the park would be inspected. Any weed species there would be destroyed.
	On a case-by-case basis, suitable materials such as the following may be used for any erosion control dams that may be necessary: certified weed-free rice straw, cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales. If those materials were not available, similar approved materials would be used. Construction equipment would be cleaned of debris and foreign vegetation before entering the park.
Wetlands	Sedimentation from construction activities would be mitigated with appropriate sediment and erosion control measures, such as silt fence and revegetation of disturbed soils. The hydrology of wetlands in the vicinity of construction activities would be protected by proper placement of road drainage facilities.
Cultural Resources	In the event that archeological resources are discovered during construction, work would be halted or redirected to another area of the project until the resources were documented, their significance assessed, and appropriate mitigation strategies developed in consultation with the North Dakota State Historic Preservation Officer or Native American tribe, if appropriate.
	In the unlikely event that human remains or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered, work would stop in the area of the discovery, and the appropriate provisions of the NAGPRA (43 CFR Part 10) would be implemented.
	All work would be conducted in a manner that is consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Structures and the Secretary of the Interior's Standards for the Treatment of Historic Properties*.
Visitor Use and Experience	A public information program to warn of construction related road closures, delays, and road hazards would be implemented. Vehicle traffic would be managed within the construction zone, to minimized disruptions in visitor traffic. A safety plan would be developed prior to construction, to ensure the safety of park visitors, workers, and park staff.

COMPARISON OF THE ALTERNATIVES

The following table compares and contrasts the alternatives, including the degree to which each alternative accomplishes the purpose or fulfills the need of the proposed project.

Table 2. Comparison of the Alternatives

Alternative A – No Action	Alternative B – Preferred Alternative
The no-action alternative would maintain the existing routine of continuing roadway maintenance and repairs. The park would continue to clear culverts, stabilize slopes, patch potholes, and complete other repairs as needed. Repair costs would increase as the roadway continued to deteriorate. The no-action alternative would not improve safety, visitor access, or drainage along Scenic Drive throughout its 14 mile length. Only localized repairs would be completed as needed. Meets Project Purpose and Need and Objectives? **No**	The preferred alternative would repave and rehabilitate Scenic Drive and roadside facilities throughout its 14 mile length, extending their useable life and improving visitor safety. Meets Project Purpose and Need and Objectives? **Yes**

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The following table summarizes the impacts of the proposed alternatives on park resources.

Table 3. Summary of Environmental Consequences

Impact Topic	Alternative A No-action Alternative	Alternative B Preferred Alternative
Invasive Exotic Plants	Alternative A would have no impact on invasive exotic plants. There would be no cumulative impacts. There would be no impairment of the park's resources or values.	Alternative B would have a short term, minor, adverse impact. Disturbance of soils and displacement of vegetation by construction activities would provide conditions favorable for invasive exotic plants. Alternative B would also have a long term beneficial impact on invasive exotic plants. Disturbed areas would be revegetated with native species, which would inhibit future establishment of exotic invasives and would help preserve the genetic integrity of native park plant communities. Cumulative impacts would be short term, minor, adverse, and long term beneficial. There would be no impairment of the park's resources or values.
Wetlands	Alternative A would have a long term minor adverse impact on wetlands. There would be no cumulative impacts. There would be no impairment of the park's resources or values.	Alternative B would have a short term minor adverse impact, a long term minor adverse impact, and a long term beneficial impact on wetlands. There would be no cumulative impacts. There would be no impairment of the park's resources or values.

Impact Topic	Alternative A No-action Alternative	Alternative B Preferred Alternative
Historic Structures	Under Alternative A there would be local, short-term and long-term, moderate adverse impacts due to ongoing deterioration from erosion, limited maintenance, and vegetation. There would be no cumulative impacts. There would be no impairment of park resources or values. Under Sec. 106 implementing the no-action alternative would have an ***adverse effect*** on a property that is eligible for listing in the national register.	Under alternative B, there would be local, long-term, minor adverse impacts and long-term beneficial impacts due to the rehabilitation of historic stone masonry features along Scenic Drive. There would be no cumulative impacts. There would be no impairment of park resources or values. Under Sec. 106, the NPS preferred alternative would have a ***no adverse effect*** on a property eligible for listing in the national register.
Visitor Use and Experience	Alternative A would have short-term and long-term, minor, adverse impacts, as well as moderate long-term adverse impacts on visitor use and experience. Cumulative impacts would be short-term and long-term minor, adverse, and long-term moderate adverse.	Alternative B would have short term minor adverse impacts, long term minor adverse impacts, and long term beneficial impacts on visitor use and experience. Cumulative impacts would be short and long term, minor, adverse, and long term beneficial.
Park Operations and Management	Alternative A would have long-term, moderate, adverse impacts on park operations and management. Cumulative impacts would be long-term, moderate, and adverse.	Alternative B would have short term and long term, minor, adverse impacts, as well as a long term beneficial impact on park operations and management. Cumulative impacts would be long term, minor, adverse, and long term beneficial.

THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with Director's Order #12, the NPS is required to identify the "environmentally preferred alternative" in all environmental documents, including EAs. According to CEQ guidelines, the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of NEPA, which considers:

1. fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assuring for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieving a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, section 101).

The no-action alternative is not the environmentally preferred alternative, because it does not fulfill criteria 1, 2, 3, 4, or 5, listed above, as well as the NPS preferred alternative. Specifically, the no-action alternative would not meet criterion 1 (to assure that Scenic Drive is maintained over time for each succeeding generation), because the roadway and drainage system would continue to deteriorate.

Criteria 2 and 3 also would not be completely met. The segment of roadway through Cedar Canyon would remain unpaved and its road base and subgrade would be subject to failure, diminishing the aesthetic appeal and the overall enjoyment of the drive through the park. Trail access would not be upgraded to meet ADA accessibility standards at the River Bend and the Oxbow overlooks. The roadway in the vicinity of the River Bend overlook would not be rehabilitated.

The no-action alternative would maintain the historic stone masonry headwalls and endwalls through periodic clearing of sediment and repairs to failing mortar joints as feasible. However, without rehabilitative reconstruction, some would continue to deteriorate, and the no-action alternative would not fully achieve criterion 4.

Rehabilitation would be necessary to best achieve criterion 5: a balance between the resources and the populations that use Scenic Drive to assure a high standard of living. The no-action alternative does not achieve that balance, because the roadway is not designed for the very large recreational and commercial touring vehicles that use it. Therefore, the no-action alternative would not meet criterion 5.

Alternative B, the preferred alternative, best fulfills all the criteria of the environmentally preferred alternative. The rehabilitation of Scenic Drive would fulfill the Park Service's responsibilities as a trustee of the environment (criterion 1) by rehabilitating certain elements of Scenic Drive essential to the long-term viability of the transportation infrastructure.

Alternative B would assure a safe and aesthetically pleasing environment for future

generations (criterion 2) through context-sensitive design and measures to minimize impacts to sensitive resources on the drive. Alternative B attains the widest ranges of beneficial uses without risk of safety (criterion 3). A primary purpose of the proposed project is to maintain the useful life of the roadway; through proper planning, the NPS would minimize the risk of other undesirable and unintended consequences.

Alternative B would preserve, to the extent practicable, important historic resources (criterion 4) through the rehabilitation and repair of the road surface, drainages, and a number of historic stone drainage structures, and by eliminating roadside erosion that threatens the integrity of the road.

Alternative B achieves a balance between park resources and the populations who use Scenic Drive to assure a high standard of living, and it enhances the quality of renewable resources (criteria 5 and 6). That balance is accomplished through repairing and upgrading the existing drainage system and implementing modern safety standards with minimal compromise to the park resources, such as wetlands, and visitor experience. It extends the useful life of the roadway and its associated drainage system. For these reasons, alternative B is the environmentally preferred alternative.

ALTERNATIVES CONSIDERED BUT DISMISSED

Field review and scoping by NPS and Federal Highway Administration staff determined that only two alternatives are feasible. The no action alternative would continue ongoing maintenance practices. The preferred alternative, as described in this EA, would rehabilitate and repair the entire length of Scenic Drive.

CHAPTER 3: THE AFFECTED ENVIRONMENT

INVASIVE EXOTIC PLANTS

A report, *USGS-NPS Vegetation Mapping Program, Theodore Roosevelt National Park, North Dakota,* published March 7, 2000 identifies the plant communities throughout the park, including invasive exotic plants (exotics). The following discussion of exotics in the park is primarily from the March 2000 Mapping Program report. A thorough list of plant species identified within the park is provided as Appendix N in that report.

Plant species are considered invasive if they demonstrate one or more of the following:

1. Alter ecosystem function (fire frequency/intensity and water consumption/transort)
2. Establish in undisturbed natural areas.
3. Out-compete natives after natural disturbance
4. Prevent or depress regeneration of native species.

Invasive exotic plant species are wide-spread in some areas of the park, including introduced grasses. Exotic grasses make up the introduced grassland herbaceous alliance and are dominant in several areas within the park, having spread from historic erosion control plantings along roadways, on sites seeded following disturbance due to construction, and possibly from range improvement seeding. As a result, large patches of Kentucky bluegrass (*Poa pratensis*), crested wheatgrass (*Agropyron cristatum*), and smooth brome (Bromus inermis) are present. These species produce large amounts of litter, which in the absence of grazing and fire, shades the ground and increases soil moisture, thus excluding most native grasses and forbs.

Only a few small patches of leafy spurge (*Euphorbia esula*) were observed in the North Unit, under sandbar willow shrubs on the first terrace of the Little Missouri River floodplain.

Pockets of Canada thistle (*Cirsium arense*) are also present, especially along the Scenic Drive roadway corridor. Park staff spray the roadway corridor and other affected areas to eradicate invasive plants, and map their treatment areas. A number of small Canada thistle patches were identified and coordinates recorded in 1997 during the observation work for the Mapping Program report and the accuracy assessment work in 1998. A large stand grows with silver sagebrush along Corral Creek in the southern portion of the North Unit.

Yellow sweetclover (*Melilotus officinalis*) is notable, particularly in the North Unit. Because of its height and density, it may however serve to "hide" signatures of other classes. This exotic biennial is more common in moist soils that usually support the western wheatgrass herbaceous alliance grasslands and hardwood draws. Exotic species have also invaded prairie dog towns, including field bindweed (*Convolvulus arvensis)*, yellow sweetclover, leafy spurge, and Canada thistle.

Appendix B of this EA includes lists of common plants in the park, North Dakota state listed noxious weeds, and North Dakota state plant species of concern. Appendix B also includes a summary of a revegetation plan for Scenic Drive.

WETLANDS

Wetlands include areas inundated or saturated by surface or groundwater for a sufficient length of time during the growing season to develop and support characteristic

soils and vegetation. NPS classifies wetlands based on the U.S. Fish and Wildlife Service (USFWS) Classification of Wetlands and Deepwater Habitats of the United States, commonly referred to as the Cowardin classification system (Cowardin et al. 1979).

Based on this classification system, a wetland must have one or more of the following attributes:

- the habitat at least periodically supports predominately hydrophytic vegetation (wetland vegetation);
- the substrate is predominately undrained hydric soil; or
- the substrate is non-soil and saturated with water, or covered by shallow water at some time during the growing season.

To be consistent with permitting requirements established under Section 404 of the Clean Water Act, the extent of wetlands occurring in the vicinity of Scenic Drive was determined based on criteria established in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), and included additional wetland habitats determined present based on the Cowardin classification system.

The field investigations conducted on January 16 and 17, 2007 documented five wetlands in the vicinity of the project proposed for the repair and rehabilitation of Scenic Drive. Two wetlands were identified in Cedar Canyon, near milepost 7.0. A palustrine forested slope wetland is located in a small gulch approximately 60 feet north of the roadway, at the base of the roadway embankment. That wetland is 0.03 acre in size. Hydrology for that wetland is driven by subsurface seepage from the adjacent slope to the south of Scenic Drive. The seepage flows in culverts under Scenic Drive and drains into the wetland. The wetland also receives seasonal surface water flowing into the gulch in which the wetland is situated.

A second palustrine forested slope wetland is on the south side of Scenic Drive at milepost 7.0. It is situated beside Scenic Drive at the base of the steep slope that rises from the south side of the road. It is 0.08 acre in size. Water for the wetland is from seepage from the slopes above it.

There are three wetlands north of Scenic Drive near the roadway bridge crossing Squaw Creek. A palustrine scrub-shrub riverine wetland 0.33 acre in size is located between the west bank of Squaw creek and the Scenic Drive roadway embankment.

A riverine wetland with components of palustrine emergent and palustrine scrub-shrub vegetation is located on the east bank of Squaw Creek. The wetland extends northward beyond the delineation boundary adopted for this survey and southward to the base of the roadway embankment. It is at least 0.95 acre in size.

A small palustrine emergent riverine fringe wetland, 0.01 acre in size, is situated on a silt deposit within the stream channel of Squaw Creek. It is approximately 200 feet north of Scenic Drive.

The wetland delineation maps and their associated photographs are included with this EA as Appendix C.

HISTORIC STRUCTURES

The significance of historic properties is generally judged against a property's ability to meet, at a minimum, one of the four criteria for inclusion on the National Register of Historic Places (36 CFR 60). Those criteria are as follows:

1. association with events that have made a significant contribution to the broad patterns of our history; or
2. association with the lives of persons significant in our past; or
3. properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
4. property that has yielded or may be likely to yield, information important in prehistory or history.

Properties may be eligible for the national register for contributions at the national, state, or local level. Ordinarily, properties achieving significance within the last 50 years are not considered eligible unless they are integral parts of historic districts or unless they are of exceptional importance. Additionally, in order for a structure or building to be listed in the national register, it must possess historic integrity of those features necessary to convey its significance (i.e., location, design, setting, workmanship, materials, feeling, and association see National Register Bulletin #15, "How to Apply the National Register Criteria for Evaluation" (NPS, 1990).
Authorized by the National Historic Preservation Act of 1966, the National Register of Historic Places is the nation's official list of districts, sites, buildings, structures, and objects in both public and private ownership that are significant in American history, architecture, archeology, engineering, and culture.

The park was originally established because of its association with Theodore Roosevelt and the open range cattle industry. All of the historic resources associated with Roosevelt and the open range are located in the South Unit of the park.

Figure 3. Feature 56, Stone Masonry Endwall

The other historic theme associated with the park is represented in the North unit and involves the federal relief programs and their projects during the 1930s and early 1940s. From 1934 to 1941 the Civilian Conservation Corps (CCC) built the following structures in the North Unit: the camp-tender cabin and two picnic shelters – one at the campground picnic area and the other at the River Bend Overlook. The North Unit loop road was built by the CCC in 1936.

The CCC also built numerous stone and mortar features associated with Scenic Drive. These features are typically drainage culvert headwalls and endwalls, or stone-lined arch culverts. The stone material came from a quarry in the north unit. In 1976 the NPS submitted the "North Unit CCC Structures" nomination for listing on the National Register of Historic Places. On August 1, 1978 the nomination was approved by North Dakota State Historic Preservation Officer James E. Sperry. In 1982, all the historic properties that had been listed were removed from the national register because of a U.S. Congressional Act

that changed the primacy of the park designation from a cultural resource emphasis to a natural resource emphasis. The park staff is in the process of re-nominating Scenic Drive. The CCC structures, including all the associated stone road features surveyed in 2006 by NPS staff from the Denver Service Center, will be included as contributing factors. There were fifteen stone features located, recorded, and identified as contributing to the national register nomination for the CCC structures.

All of the stone headwalls, endwalls, and arch culverts have been weathered by water erosion, freezing and thawing of the mortar and the stones, and encroachment by trees and brush. The trees and brush impede water flow through the culverts and contribute to the buildup of sediments. Moisture held in the sediments can accelerate the deterioration of the masonry mortar. The roots of the trees and brush grow into the stone structures and can loosen individual stones. The condition of the structures ranges from good to poor, with 90% to 30% of their historical integrity intact, respectively.

VISITOR USE AND EXPERIENCE

The North Unit of Theodore Roosevelt National Park had 51,119 visitors in 2005. Visitation levels have varied throughout the years. In 1998 the North Unit had 84,288 visitors. Visitation levels declined gradually until the year 2001, when 30,600 visitors came to the North Unit. Visitation has gradually increased again since then. In 2006 the number of visitors to the North Unit was 42,933.

The North Unit is open to visitors throughout the year, although the visitor center is closed on major winter holidays. The greatest numbers of visitors typically come in June, July, August, and September. The visitor center has a museum, a book store, and a theater that displays films about park features. Except during the winter, the Visitor Center is open throughout the week. During the winter it is open on weekdays only, as staffing permits.

The most common visitor activity is a motor trip along Scenic Drive, for wildlife viewing and to enjoy the varied scenery. Scenic Drive is a two-lane road, paved with asphalt. It has a posted speed limit of 25 miles per hour. The road extends from milepost 0.0, at the park entrance on the east side of the park to the Oxbow Overlook at milepost 14.0, near the western park boundary. Between the visitor center and the Oxbow Overlook there are eight scenic pull-outs and the Juniper Campground.

The road is curvy and hilly throughout most of its route, with no median barrier. During the winter the road is closed between the Caprock Coulee pullout, at approximately milepost 6.5, and the terminus at the Oxbow Overlook.

Approximately 850 feet of the paved road through Cedar Canyon near milepost 7.0 is surfaced with gravel. Damage caused by subsurface water seepage in that area has caused heaving and seriously damaged the pavement. In 2006 that segment of damaged pavement was covered with gravel to provide a smoother and safer surface. A section of the road near the River Bend Overlook has been damaged by slumping at the steep outside slope. Damage on and near Scenic Drive is depicted in figures 4 through 7.

Camping and picnicking sites with restroom facilities and potable water are available at the Juniper Campground. Campsites are available for tents, trailers, and recreational vehicles. A sanitary dump station is located near the entrance of Juniper Campground from May through September.

Campers often spend a single night in the park, stopping while en route to additional destinations. A permit must be obtained from the park for backcountry camping, or for camping anywhere other than in the Juniper Campground.

There are five trails maintained for hiking and horseback riding in the North Unit. Cross country skiing and snowshoeing also are allowed. Bicycles or other off-road vehicles are not allowed on the trails. All visitors' vehicles are limited to travel on established roads.

A great variety of wildlife can be seen throughout the park, along Scenic Drive and its pullouts, and from any of the backcountry trails. All of the park's animal life is wild and can be dangerous if visitors approach too closely.

Canoeing and kayaking can be enjoyed on the Little Missouri River, but those activities are generally limited to the spring season, when water levels are sufficient.

PARK OPERATIONS AND MANAGEMENT

The park has approximately 31 permanent employees, in the north unit and the south unit combined. It has an approximately equal number of additional seasonal employees in the summer months. Interns and volunteers augment the paid staff. Personnel resources are distributed among the resource management, maintenance, visitor and resource protection, administration, and interpretation functions. When invited, park personnel take part in search and rescue, fire suppression, and law enforcement activities in the surrounding area. Some of these activities are facilitated through a cooperative agreement with the county sheriff.

The park is divided into three separate units. The North Unit is in McKenzie County. The South Unit is approximately 50 miles south of the North Unit, in Billings County. Park operational facilities are concentrated in the headquarters and visitor center areas at the entrance of the South and North units of the park. The Elkhorn Ranch Unit, located approximately halfway between the North Unit and the South Unit, is also in Billings County. The Elkhorn Ranch Unit is undeveloped and is monitored during onsite visits by park personnel throughout the year.

There are 69 buildings in the park, including structures used for headquarters, resource management, visitor protection, maintenance and operations, and visitor services, as well as residences and comfort stations. The park has major equipment such as trucks, trailers, and construction equipment to support park operations.

The general park management objective is to protect and preserve the natural scene and cultural landscape, and to provide the opportunity for people to understand and appreciate the natural landscape, flora, and fauna.

For management purposes the park is divided into four zones: natural, cultural, development, and special use. The natural zone is managed to maintain the primitive character and natural processes of the park, and includes all of the park's designated wilderness.

In the cultural zone, management strategies focus on preservation, interpretation, and protection of historic and archeological resources.

The development zone provides the necessary space for visitor and management facilities and utilities. All construction activities identified under the preferred alternative discussed in this EA would occur with land classified as development zone.

The special use zone consists of land east of U.S. Highway 85 easements, and is subject to agricultural, recreational, and limited residential and visitor services uses, such as small-scale accommodations that are compatible with protection of scenic values. Industrial facilities are not compatible with the management direction for this zone.

Administrative staff are responsible for the budget, personnel, time, purchasing, training, oversight of policy guidance and procedures, safety, and overall program management. Planning staff are responsible for all program project planning.

Operations staff members are responsible for the work in the field. The work includes fire fighting, vehicle maintenance, weather station maintenance, safety, and upkeep for the buildings and grounds, as well as road maintenance.

Road maintenance includes activities such as filling potholes and depressions, repairing eroded shoulders, removing debris from roadway drains, sealing roadway cracks with a liquid asphalt sealant, and chip sealing the roadway as needed (typically every 3 to 5 years). Maintenance on Scenic Drive also includes grading and placing gravel on unpaved segments of the roadway.

Figure 4. Erosion near milepost 1.7 on Scenic Drive.

Such erosion would threaten the road bed over time. Realignment of an existing drain culvert would prevent further erosion.

Figure 5. The pavement ends near milepost 7.0.

Subsurface seepage weakened the subgrade, and over time destroyed the pavement on the 850 section of Scenic Drive in Cedar Canyon.

Figure 6. Subsurface drain placement

Subsurface drains would be placed within the road bed in an 850 foot long section of Scenic Drive in Cedar Canyon. Removing subsurface seepage would prevent deterioration of a paved surface through the canyon.

Figure 7. Slumping

A section of Scenic Drive near the River Bend Overlook is threatened by slumping of the steep outside slope.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section describes the environmental consequences associated with the alternatives. It is organized by impact topics. These discussions focus on the environmental consequences, and allow a standardized comparison between alternatives based on the most relevant topics. The National Environmental Policy Act (NEPA) requires the evaluation to include consideration of type, context, intensity and duration of impacts; direct and indirect impacts; cumulative impacts and measures to mitigate impacts. NPS policy also requires that "impairment" of resources be evaluated in NEPA documents.

GENERAL METHODOLGY

Overall, the NPS based these impact analyses and conclusions on the review of existing literature and park studies, information provided by experts within the park and other agencies, professional judgment and park staff insights, and public input.

Definitions

The following terms were used to define the nature of impacts associated with project alternatives:

Type: Impacts can be beneficial or adverse.

***Context*:** Context is the setting within which an impact would occur, such as local, park-wide, or regional.

Impact intensity: Impact intensity is defined individually for each impact topic. There may be no impact, or impacts may be negligible, minor, moderate, or major.

Duration: Duration of impact is analyzed independently for each resource because impact duration is dependent on the resource being analyzed. Depending on the resource, impacts may last as long as construction takes place, or a single year or growing season, or longer. For purposes of analysis, impact duration is described as short-term or long-term.

Direct and Indirect Impacts

Effects can be direct, indirect, or cumulative. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later or farther away, but are still reasonably foreseeable.

Direct and indirect impacts are considered in the analysis but not specified in the narratives.

Cumulative Effects

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for all alternatives, including the no-action alternative.

Cumulative impacts were determined by combining the impacts of the alternatives

with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Theodore Roosevelt National Park and, if applicable, the surrounding region.

To determine potential cumulative impacts, projects in the area surrounding the proposed project were identified. The area included the park and roadways in the vicinity of the park. Projects were identified in consultation with park staff and in a telephone conversation with W. Peterson, the district engineer of the North Dakota Department of Transportation., on November 15, 2006. Potential projects identified as cumulative actions included any planning or development activity that was implemented in the recent past, that is currently being implemented, or that would be implemented in the reasonably foreseeable future.

These cumulative actions are evaluated in the cumulative impact analysis in conjunction with the impacts of each alternative to determine if they would have any additive effects on a particular resource. Because some of these cumulative actions are in the early planning stages, the evaluation of cumulative effects is qualitative and based on a general description of the project.

Past Actions. In 2002 the North Dakota Department of Transportation (NDDOT) repaired damage from a rock and soil slide along Highway 85, approximately two miles south of the North Unit entrance. About three quarters of a mile of the roadway was rebuilt, with a small alignment change. Traffic was allowed to move through the construction area during repairs, with lane changes as needed. The repairs took five months to complete.

In 2002 approximately 150 feet of Scenic Drive just downhill from the River Bend Overlook were repaired when the steep outside slope failed and slumped. The shoulder and roadway were rebuilt and the roadway was repaved. In 2006 the outside slope slumped again, and approximately 50 feet of roadway were repaired. That section of repaired roadway segment was surfaced with gravel instead of asphalt pavement, and that segment of roadway remains unpaved to date.

In 2006 a segment of Scenic Drive, approximately 850 feet long, in Cedar Canyon was repaired because of subgrade failure. Subsurface seepage weakens and damages the road bed through that area, and has created the need for repeated repairs throughout past years. The asphalt pavement in that segment of roadway was overlaid with gravel, to cover the potholes and rutting caused by a saturated subgrade.

Current and Future Actions. There are no current actions inside or outside the park that would contribute cumulative impacts to the proposed project.

A future action could contribute to cumulative effects. In 2009 NDDOT plans to grade and repave six miles of Highway 85. Work will begin approximately one-half mile south of the North Unit entrance and extend southward for six miles. Traffic flow will be maintained during construction, routed through the construction area during the work.

IMPAIRMENT OF PARK RESOURCES OR VALUES

In addition to determining the environmental consequences of the alternatives, the 2001 NPS *Management Policie*s and Director's Order #12 require analysis of potential effects to determine if actions would impair park resources.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park/preserve resources and values. National Park Service managers must always seek ways to avoid or minimize to the greatest degree practicable adverse impacts on resources and values of NPS park units.

However, the laws do give NPS management discretion to allow impacts to park unit resources and values when necessary and appropriate to fulfill the purposes of a park unit, as long as the impact does not constitute impairment of the affected resources and values.

Although Congress has given NPS management discretion to allow certain impacts within park units, that discretion is limited by statutory requirements that the NPS must leave park unit resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park unit resources or values, including harming opportunities that otherwise would be present for the enjoyment of those resources or values.

An impact to any park unit resource or value may constitute impairment; however, an impact would more likely constitute impairment to the extent it affects a resource or value whose conservation is one of the following:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park unit;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park unit; or
- identified as a goal in the park unit's Master Plan or General Management Plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park unit, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park unit. In this "Environmental Consequences" chapter, a determination on impairment is made in the conclusion statement of each alternative. The NPS does not analyze recreational values/visitor experience (unless impacts are resource based), socioeconomic environment, or park unit operations for impairment.

ASSESSING IMPACTS TO CULTURAL RESOURCES

In this environmental assessment impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). These impact analyses are intended, however, to comply with the requirements of both NEPA and §106 of the National Historic Preservation Act (NHPA).

In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impacts to cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected, National Register eligible or listed cultural resources; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations a determination of either adverse effect or no adverse effect must also be made for affected National Register listed or eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register, e.g. diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance or be cumulative (36 CFR 800.5, Assessment of Adverse Effects). A determination of no adverse effect means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the National Park Service's "Conservation Planning, Environmental Impact Analysis and Decision Making"(Director's Order #12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by §106 is similarly reduced. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under §106 may be mitigated, the effect remains adverse.

A §106 summary is included in the impact analysis of historic structures in the Environmental Consequences chapter of this EA. The §106 summary is an assessment of the effect of the undertaking (implementation of the alternative) on National Register eligible or listed cultural resources only, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

IMPACTS OF INVASIVE EXOTIC PLANTS

The planning team based the impact analysis and the conclusions for possible impacts of invasive exotic plants on the on-site inspection of sites within the proposed project area, and on the report, *USGS-NPS Vegetation Mapping Program, Theodore Roosevelt National Park, North Dakota,* prepared March 7, 2000, information provided by experts in the National Park Service, and park staff insights and professional judgment. Where possible, color aerial photographs were compared with locations of proposed rehabilitation and modifications of the existing roadway. Predictions about short- and long-term site impacts were based on previous studies of impacts of invasive exotic plants from similar projects. The thresholds of change for the intensity of an impact are defined in the following table.

Table 4. Thresholds of Change for Invasive Exotic Plants

Negligible	Minor	Moderate	Major
The change in the numbers of invasive species would be observable, but there would be no effect on populations of native species. The effects would be on a small scale and no species of special concern would be affected.	The change in percentage of invasive species in comparison to other species would be observable, and would affect a relatively small portion of the native vegetation communities. The change would be relatively small in terms of area.	The change in percentage of invasive species in comparison to other species would be readily apparent, and would affect a relatively large portion of the native vegetation communities over a relatively small area.	The change in percentage of invasive species in comparison to other species would be readily apparent, and would affect a relatively large portion of the native vegetation communities over a relatively large area in and/or out of the park.

Short-term – Recovers in less than 3 years
Long-term – Takes more than 3 years to recover

Effects of Alternative A

Alternative A would not change the levels of invasive exotic plant populations in the North Unit. The park would continue its ongoing routine of maintenance and repairs and its ongoing program for control of invasive plants. The road and associated features would continue to deteriorate, and repairs would be completed as necessary. Soils disturbed and vegetation displaced by

such routine maintenance and repairs would provide conditions favorable for the establishment of invasive exotic plants, but such impacts would be mitigated by existing control measures.

Because levels of invasive exotic plants would be the same as those managed and anticipated under the existing maintenance and management regimen, alternative A would have no impact on invasive exotic plants.

Cumulative Effects

Alternative A would have no impact on invasive exotic plants. Therefore, there would be no cumulative effects.

Conclusion

Alternative A would have no impact on invasive exotic plants. There would be no cumulative impacts. There would be no impairment of the park's resources or values.

Effects of Alternative B

Alternative B would have a short term minor adverse impact and a long term beneficial impact on invasive exotic plants.

Soil and vegetation disturbances from work on the roadway shoulders and embankments would have short term, minor, adverse impacts on invasive exotic plants. Disturbance of soils and displacement of vegetation by construction activities would provide conditions favorable for the establishment of invasive exotic plants, but the impacts would be mitigated by control measures, such as a revegetation plan, restricting construction activities to specified areas, and other measures identified in Table 1 of this EA. A summary of a revegetation plan for Scenic Drive is included in Appendix B of this EA.

The impacts would be minor, because the areas where conditions would be favorable for invasion by exotic plants would be relatively small, approximately 23 acres. Those areas would include the road shoulders, as well as roadside slopes in Cedar Canyon, at the Squaw Creek bridge, and in the vicinity of the River Bend overlook. The impacts would be short term because those areas would be revegetated with native species.

The long term impacts would be beneficial. Disturbed areas would be revegetated with native species. Propagation of native species would inhibit future establishment of exotic invasives and would help preserve the genetic integrity of native park plant communities. A summary of the revegetation plan that would be implemented is included in appendix B of this EA.

Cumulative Effects

Other past or reasonably foreseeable future actions created or have the potential for impacts on invasive exotic plants. Those actions include NDDOT repairs of Highway 85 near the park boundary, the emergency repairs to Scenic Drive in Cedar Canyon and downhill from the River Bend Overlook, and NDDOT plans to grade and repave six miles of Highway 85 near the park boundary.

Construction activities during repairs to Highway 85 and segments of Scenic Drive have had or would have a minor short term adverse impact. Roadside areas with soils and vegetation disturbed during construction provide conditions favorable to the spread of exotic plants. The disturbance in such instances is limited to the vicinity of the road project, and disturbed areas are revegetated with native species.

The long term impact of those road repairs is beneficial. Propagation of native species inhibits future establishment of invasive

exotic plants and helps preserve the genetic integrity of native plant communities.

Those impacts, in combination with the short term minor adverse impacts and long term beneficial impacts from alternative B, would result in short term, minor, adverse, and long term beneficial cumulative impacts on visitor use and experience.

Conclusion

Alternative B would have a short term, minor, adverse impact and a long term beneficial impact on invasive exotic plants. Cumulative impacts would be short term, minor, adverse, and long term beneficial. There would be no impairment of the park's resources or values.

IMPACTS TO WETLANDS

The planning team based the impact analysis and the conclusions for possible impacts to wetlands on the on-site inspection of known and potential jurisdictional wetlands within the park, review of existing literature and studies, information provided by experts in the National Park Service and other agencies, and park staff insights and professional judgment. Where possible, map locations of wetlands were compared with locations of proposed developments and modifications of existing facilities. Predictions about short- and long-term site impacts were based on previous studies of impacts to wetlands from similar projects and recent scientific data. The thresholds of change for the intensity of an impact are defined in the following table.

Table 5. Thresholds of Change for Wetlands

Negligible	Minor	Moderate	Major
The effects would be detectable, but would be at the lower levels of detection.	The effects to wetlands would be detectable and relatively small in terms of area and the nature of the change. The action would affect a limited number of individuals of plant or wildlife species within the wetland.	The effects to wetlands would be readily apparent over a relatively small area but the impact could be mitigated by restoring previously degraded wetlands. The action would have a measur-able effect on plant or wildlife species within the wetland, but all species would remain indefinitely viable.	The effects to wetlands would be readily apparent over a relatively large area. The action would have measurable consequences for the wetland area that could not be mitigated. Wetland species dynamics would be upset, and plant and/or animal species would be at risk of extirpation from the area.

Short-term – Recovers in less than 3 years
Long-term – Takes more than 3 years to recover

Effects of Alternative A

Alternative A would have a long term minor adverse impact on wetlands. Precipitation and high stream flows would continue to erode soil from the stream banks into Squaw Creek near the Juniper Campground.

Work on the roadway and on the Squaw Creek stream banks would occur at irregular intervals, as repairs become necessary. Stream bank erosion adjacent the bridge over Squaw Creek would be backfilled when necessary, to protect the integrity of the bridge and roadway. Some soil from those repairs would temporarily increase the turbidity of the creek flows, although best management practices would be implemented to control erosion and sedimentation.

The effect would be detectable intermittent increases in the turbidity of the water, but the areas affected would be small. Some plants or animals would be adversely impacted by deposition of sediments and by the decreased water quality, but the species' populations would remain viable.

In Cedar Canyon, precipitation would continue to erode soil from the graveled roadway and the road embankment, and intermittent roadway repairs there would deposit loose soils and gravels on the road embankments. However, the dense growth of shrubs, trees, and grasses between the wetland below the roadway would protect that wetland from sedimentation, so there would be no impact to it. The wetland at milepost 7.0 in Cedar Canyon is on the upslope side, and would not be impacted by sediments eroded from the roadway.

Cumulative Effects

None of the past or future actions considered in this EA have impacted or will impact wetlands in the area. Therefore, the implementation of alternative A would create no cumulative impacts.

Conclusion

Alternative A would have a long term minor adverse impact on wetlands. There would be no cumulative impacts. There would be no impairment of the park's resources or values.

Effects of Alternative B

Alternative B would have a short term minor adverse impact, a long term minor adverse impact, and a long term beneficial impact on wetlands.

Work on the roadway embankments at the Squaw Creek bridge would create a short term minor adverse impact on the wetlands there. The eroded embankments would be repaired with soil fill and armored with stone riprap or gabions. Some sedimentation would occur because of those activities.

The impact from potential sedimentation would be minor, because the affected areas would be small, (approximately 0.25 acre) limited to the wetlands and the stream in close proximity to the bridge. Some plants or animals within the wetlands would be adversely impacted by deposition of sediments and by increased water turbidity, but the species' populations would remain viable.

A long term minor adverse impact would be created by placement of riprap or gabions on the stream banks and within the stream in the vicinity of the bridge. Riprap or gabion armor would cover approximately 0.03 acre of embankment, with the toe of the armor within the streambed at the northwest corner of the bridge. Because a relatively small area would be covered, and a limited number of plants and wildlife would be affected, the impact would be minor.

The long term impact to the wetlands adjacent the bridge would be beneficial. The stone riprap or gabions would prevent future erosion and would decrease sedimentation in the wetlands.

In Cedar Canyon, excavation of the roadway for subgrade improvements and installation of subsurface drains would deposit some loose soils and gravels on the road embankments. However, sedimentation control measures such as silt fencing, combined with the dense growth of shrubs, trees, and grasses between the roadway and the wetland at the base of the roadway slope would protect that wetland from sedimentation, so there would be no impact to it. The wetland at milepost 7.0 in Cedar Canyon is on the upslope side, and would not be impacted by sediments eroded from the roadway.

Because the hydrology of the downslope wetland would be protected by leaving in place the culverts that direct water into it, work on roadway drainage improvements would not impact that wetland.

The sources of water for the upslope wetland are seepage and flows from the slope above it. Roadway rehabilitation activities there would not impact the hydrology of that wetland.

Director's Order 77-1, Wetland Protection, subsection 4.2 Excepted Actions, advises that maintenance, repair, or renovation of currently serviceable facilities or structures are actions that are excepted from the requirement to prepare a wetland statement of findings. This exception allows for a total deviation of 0.1 acre or less in the structure's configuration or fill footprint. Because the repairs to the embankments at the Squaw Creek bridge would impact less than 0.1 acre of wetland, a statement of findings will not be required for this proposed project.

Cumulative Effects

None of the past or future actions considered in this EA have impacted or will impact wetlands in the area. Therefore, the implementation of alternative B would create no cumulative impacts.

Conclusion

Alternative B would have a short term minor adverse impact, a long term minor adverse impact, and a long term beneficial impact on wetlands. There would be no cumulative impacts. There would be no impairment of the park's resources or values.

IMPACTS TO HISTORIC STRUCTURES

In order for a structure or building to be listed on the National Register of Historic Places, it must be associated with an important historic context, i.e., possess significance—the meaning or values ascribed to the structure or building—and have integrity of those features necessary to convey its significance, i.e., location, design, setting, workmanship, materials, feeling, and association (see National Register Bulletin #15, "How to Apply the National Register Criteria for Evaluation"). For purposes of analyzing potential impacts to historic structures, the thresholds of change for the intensity of an impact are defined in table 6.

Table 6. Thresholds of Change for Historic Structures

Impact Intensity	Impact Description
Negligible	Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for Section 106 would be *no adverse effect*.
Minor	Adverse impact – alteration of a feature(s) would not diminish the overall integrity of the resource. The determination of effect for Section 106 would be *no adverse effect*.
Moderate	Alteration of a feature(s) would diminish the overall integrity of the resource to the point where the resource may no longer be eligible for listing on the National Register of Historic Places. The determination of effect for Section 106 would be *adverse effect*. A Programmatic Agreement (PA) is executed among the National Park Service and applicable state or tribal historic preservation officers and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the PA to minimize or mitigate adverse impacts would have a high degree of success.
Major	Alteration of a feature(s) would diminish the overall integrity of the resource to the point where the resource would no longer be eligible for listing on the National Register of Historic Places. The determination of effect for Section 106 would be *adverse effect*. A Programmatic Agreement (PA) is executed among the National Park Service and applicable state or tribal historic preservation officers and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b).

Short-term – occurs only during the construction period.
Long-term – continues after the construction period

Examples of beneficial effects: stabilization/ preservation of character defining features, rehabilitation of a structure or building, restoration of a structure or building in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Effects of Alternative A

Under Alternative A, the NPS would continue management actions that would include minor repairs of the stone masonry headwalls, endwalls, and any other historic stone feature within the project area. The stone masonry features would continue to be impacted by limited maintenance, vegetation, and erosion. The overall integrity of the stone drainage structures has been adversely impacted by previous weathering, and continuing the current routine of maintenance and repairs would result in further loss of integrity. Therefore, there would be short term and long term, moderate, adverse impacts to historic structures.

Cumulative Effects

There are no past, present, or future actions that would contribute cumulative impacts. Past and future repairs to nearby Highway 85 have not and will not add cumulative impacts, and past repairs to Scenic Drive have not impacted the stone masonry features along the roadway. Therefore, alternative A would have no cumulative effects on historic structures.

Conclusion

Under Alternative A there would be local, short term and long term, moderate adverse impacts due to ongoing deterioration from erosion, limited maintenance, and vegetation. There would be no cumulative impacts. Because there would be no major adverse impacts, there would be no impairment of park resources and values.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the NPS proposes that implementing the Alternative A would have an adverse effect on a property that is eligible for listing in the National Register.

Effects of Alternative B

Under alternative B the impacts to historic structures would be long-term, local, minor and adverse, as well as beneficial. The adverse impacts would be minor because historic stones would be re-used when the stones structural integrity is intact, feature locations would not change, and the character defining elements of each feature would remain the same, such as, using similar colored mortar, recessing mortar the same depth as the historic mortar and any new stones would match the color and texture as the original stones. The impact would be beneficial because several of the stone culverts have cracks 0.75 inch to 1.25 inch wide, and their structural integrity is compromised, as exhibited by the 6 inch to 10 inch bowing of some of the structures. Under alternative B, the cracks would be re-mortared and the road behind the structures would be stabilized, so there would be no more bowing.

Cumulative Effects

There are no past, present, or future actions that would contribute cumulative impacts. Past and future repairs to nearby Highway 85 have not and will not add cumulative impacts, and past repairs to Scenic Drive have not impacted the stone masonry features along the roadway. Therefore, alternative B would have no cumulative effects on historic structures.

Conclusion

Under alternative B, there would be local, long term, minor adverse impacts and long term beneficial impacts due to the rehabilitation of historic stone masonry features along Scenic Drive. There would be no cumulative impacts. Because there would be no major adverse impacts there would be no impairment of park resources and values.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the NPS proposes that implementing the NPS Preferred Alternative would have a no adverse effect on a property eligible for listing in the National Register.

IMPACTS TO VISITOR USE AND EXPERIENCE

NPS *Management Policies 2006* state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks.

Part of the purpose of Theodore Roosevelt National Park is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, one of the park's management goals is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities.

Public scoping input and observation of visitation patterns combined with assessment of what is available to visitors under current management were used to estimate the effects of the actions in the various alternatives in this document. The impact on the ability of the visitor to experience a full range of park resources was analyzed by examining resources and objectives presented in the park significance statement. The potential for change in visitor use and experience proposed by the alternatives was evaluated by identifying visitor uses, and determining whether or how these projected changes would affect the desired visitor experience and to what degree and for how long. For purposes of analyzing potential impacts to visitor use and experience, the thresholds of change for the intensity of an impact are defined in table 7.

Table 7. Thresholds of Change for Visitor Experience

Negligible	Minor	Moderate	Major
Changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.	Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.	Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.	Changes in visitor use and/or experience would be readily apparent and severely adverse. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

Short-term – occurs only during the treatment action
Long-term – occurs after the treatment action

Effects of Alternative A

Alternative A would have short term and long term minor adverse impacts from dust generation, noise, reduced visual quality during intermittent road repairs and maintenance. Alternative A would also have long term moderate adverse impacts if the road surface continues to deteriorate.

Periodic road maintenance or emergency road repairs, as well as embankment repairs at locations such as the bridge over Squaw Creek, would result in minor short term adverse impacts from noise, delays, and diminished visual quality. Some repairs of eroded slopes near the roadway would include placement of stone riprap, introducing a new and unnatural element to the visual experience. Impacts would affect visitors in adjacent wilderness areas as well as those on the roadway.

Road noise and associated activities during maintenance and repair would likely cause wildlife to avoid the construction areas, reducing visitors' opportunities for wildlife viewing in proximity to the road. Those effects would be noticed by visitors, but the effects would be slight.

Alternative A would have long term minor adverse impacts from dust generation in segments of the road that are surfaced with gravel rather than asphalt pavement. Dust would accumulate on adjacent vegetation, reducing the visual quality in the area. Dust is also an irritant to drivers and passengers and to bikers or hikers in close proximity to those road segments. Those effects would be noticed by visitors, but their effects would be slight.

However, in the long term, as more of the road surface continues to deteriorate, there would be a moderate adverse effect on visitor use and experience. Visitors would need to focus more on driving, thus limiting their ability to experience the park's scenery and wildlife. The continued deterioration and increased frequency of maintenance and repairs would convey the impression that the park is poorly maintained, thus diminishing the overall park experience. Visitors would be aware of the effects associated with the deteriorating roadway and would be likely to express an opinion about the conditions.

Cumulative Effects

Other past or reasonably foreseeable future actions created or have the potential for impacts on visitor use and experience. Those actions include NDDOT repairs of Highway 85 near the park boundary, the emergency repairs to Scenic Drive in Cedar Canyon and downhill from the River Bend Overlook, and NDDOT plans to regrade and repave six miles of Highway 85 near the park boundary .

Visitors experienced or will experience short term, minor, adverse impacts caused by delays and other inconveniences during repairs to Highway 85 and segments of Scenic Drive. The long term impact of those road repairs is beneficial, providing visitor access to and from the park, and throughout the length of Scenic Drive.

Those impacts, in combination with the short and long term minor adverse impacts, and long term moderate adverse impacts from alternative A, would result in short and long term, minor, adverse cumulative impacts, and long term, moderate, adverse cumulative impacts on visitor use and experience.

Conclusion

Alternative A would have short term and long term, minor, adverse impacts, as well as moderate long term adverse impacts on visitor use and experience. Cumulative impacts would be short term and long term minor, adverse, and long term moderate adverse.

Effects of Alternative B

Alternative B would have short term minor adverse impacts on visitor use and experience during construction, because of road repair and rehabilitation activities, and it would have long term minor adverse impacts associated with maintenance activities. However, repair and rehabilitation of Scenic Drive, and construction of ADA compliant trail segments, would have long term beneficial impacts on visitor use and experience.

Most of the adverse impacts to visitor use would occur due to construction, and would be limited to the construction period. Construction along the roadway would result in minor adverse impacts on visitor use by causing increased levels of noise and dust, diminished visual quality, and delays in traveling the length of the road.

Construction of the ADA compliant trails at the River Bend Overlook and at the Oxbow Overlook would also create noise and dust, and would temporarily diminish the visual experience in those areas.

Noise and other associated activities would likely cause wildlife to avoid the construction areas, reducing visitors' opportunities for wildlife viewing in proximity to the road. During construction, visitors would also be denied access to some of the wayside exhibit pullouts, diminishing their ability to learn more about some park resources. Construction would also adversely impact noise levels and the visual experience in nearby wilderness areas. Those short term adverse impacts would be noticeable to visitors, but their effect would be slight.

Following construction, visitor experience would be improved and would benefit from alternative B. Access throughout the length of Scenic Drive would be improved, because it would be fully paved with asphalt pavement. With subgrade improvements in place, the segment of road through Cedar Canyon would no longer require frequent repairs. Visitors would be able to drive comfortably on the newly surfaced roadway, with increased opportunities to view scenery and wildlife with less need to focus on road conditions.

Road maintenance would continue to impact visitor use and experience with noise, delays, and diminished visual quality, but maintenance needs and frequencies would be reduced. Use of stone riprap or gabions to prevent erosion near the roadway would create a long term, negligible, adverse impact to visual quality, by introducing a new and unnatural visual element. The combination of intermittent road maintenance activities, combined with the addition of stone riprap in some road embankments would create a minor long term adverse impact to visitor use and experience.

Cumulative Effects

Other past or reasonably foreseeable future actions created or have the potential for impacts on visitor use and experience. Those actions include NDDOT repairs of Highway 85 near the park boundary, the emergency repairs to Scenic Drive in Cedar Canyon and downhill from the River Bend Overlook, and NDDOT plans to regrade and repave six miles of Highway 85 near the park boundary.

Visitors experienced or will experience short term, minor, adverse impacts caused by delays and other inconveniences during repairs to Highway 85 and segments of Scenic Drive. The long term impact of those road repairs is beneficial, providing visitor access to and from the park, and throughout the length of Scenic Drive.

Those impacts, in combination with the short term minor adverse impacts, long term minor adverse impacts, and long term beneficial impacts from alternative B, would result in short and long term, minor, adverse, and long term beneficial cumulative impacts on visitor use and experience.

Conclusion

Alternative B would have short term minor adverse impacts, long term minor adverse impacts, and long term beneficial impacts on visitor use and experience. Cumulative impacts would be short and long term, minor, adverse, and long term beneficial.

IMPACTS ON PARK OPERATIONS AND MANAGEMENT

The analysis of impacts on park operations was based on the judgments of park staff members of the team that evaluated the impacts of each alternative. The thresholds for the impact intensities for park operations are identified in table 8.

Table 8. Thresholds of Change for Park Operations

Negligible	Minor	Moderate	Major
The effects would be at low levels of detection and would not have an appreciable effect on park operations and management.	The effect would be detectable and would be of a magnitude that would not have an appreciable effect on park operations and management. If mitigation was needed to offset adverse effects, it would be simple and likely successful.	The effects would be readily apparent and would have an effect on park operations and management that would be noticeable to staff and the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.	The effects would be readily apparent, would have a substantial effect on park operations and management in a manner noticeable to staff and the pubic, and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, extensive, and success could not be guaranteed.

Duration
Short-term - Effects lasting for the duration of construction
Long-term - Effects lasting longer than the duration of construction

Effects of Alternative A

Alternative A would have a long term moderate adverse impact on park operations and management. The alternative would maintain the existing situation in which park staff would continue to clear culverts, stabilize slopes, patch potholes, and complete other isolated repairs as the need arises. Subsurface flows would continue to adversely affect the road subgrade in Cedar Canyon. The road would continue to deteriorate, and repair costs would continue to escalate. The repair efforts needed to offset those adverse effects would likely be

successful, but the frequency of those efforts would increase. Intermittent repairs to separate sections of the roadway would contribute to differences in work quality, as such work would be completed by different contractor crews. Temporary road closures for repairs would become more frequent. Staff time required for roadway maintenance of culverts, shoulders, and other road features would increase.

The effects of the continuing and increasing operational and maintenance demands would be readily apparent and would have a substantial effect on park operations and management in a manner noticeable to staff and the public.

Cumulative Effects

Previous emergency repairs to Scenic Drive in Cedar Canyon and downhill from the River Bend Overlook impacted park operations and management. The efficiency of travel on Scenic Drive, and thus, the ability of staff to respond to park operation and management needs, has been beneficially impacted by the emergency roadway repairs.

The segments of unpaved roadway also create a long term minor adverse impact on park operations and maintenance. The road surface there requires periodic grading and resurfacing because of traffic wear and minor erosion from surface runoff. The effect is detectable, but does not have an appreciable effect on park operations and management.

That impact, in combination with the moderate, long term, adverse impacts of the no-action alternative, would result in long term, moderate, adverse, cumulative impacts on park operations. Alternative A would add a noticeable contribution to the overall cumulative effect.

Conclusion

Alternative A would have long term, moderate, adverse impacts on park operations and management. Cumulative impacts would be long term, moderate, and adverse.

Effects of Alternative B

Alternative B would have a short term, minor, adverse impact and a long term, minor, adverse impact, as well as a long term beneficial impact on park operations and management.

The process of planning for and assisting in the completion of the repair and rehabilitation of Scenic Drive would require time and attention from park staff, which would add to their workload. Travel on Scenic Drive would be impeded during road construction activities. Those impacts would end when construction was finished. The short term impacts would be detectable, but would not have an appreciable effect on park operations and management.

Because the ability to meet park operations and management needs is based upon funding, selecting this alternative would effectively mean that many other lower priority but important repairs would not be completed. That long term impact would be detectable, but would be of a magnitude that would not have an appreciable effect on park operations and management.

If the repairs and rehabilitation of Scenic Drive proposed in alternative B were completed, maintenance workloads and costs would decrease, creating a long term beneficial impact. A newly paved roadway would require fewer periodic repairs; there would be no unpaved segments of roadway to maintain; damage caused by subsurface seepage in the roadway subgrade would be eliminated.

Cumulative Effects

Previous emergency repairs to Scenic Drive in Cedar Canyon and downhill from the River Bend Overlook have impacted park operations and management. The efficiency of travel on Scenic Drive, and thus, the ability of staff to respond to park operation and management needs, has been beneficially impacted by the emergency roadway repairs.

The segments of unpaved roadway in Cedar Canyon and near the River Bend Overlook have also created a long term minor adverse impact on park operations and maintenance. Unpaved road surfaces require periodic grading and resurfacing because of traffic wear and minor erosion from surface runoff. The effect of such maintenance needs is detectable, but does not have an appreciable effect on park operations and management.

Those impacts, in combination with the short term and long term, minor, adverse impacts, as well as a long term beneficial impact from Alternative B, would result in long term, minor, adverse, cumulative impacts on park operations. Alternative B would add a noticeable contribution to the overall cumulative effect.

Conclusion

Alternative B would have short term and long term, minor, adverse impacts, as well as a long term beneficial impact on park operations and management. Cumulative impacts would be long term, minor, adverse, and long term beneficial.

CONSULTATION AND COORDINATION

The following organizations and agencies were contacted for information, or assisted in identifying important issues or analyzing impacts.

FEDERAL AGENCIES

United States Department of the Interior – Fish and Wildlife Service

United States Department of the Interior – National Park Service

United States Department of Agriculture – Natural Resources Conservation Service

NORTH DAKOTA STATE AGENCIES

North Dakota Historical Commission

North Dakota Department of Transportation

LOCAL AGENCIES/MUNICIPALITIES

McKenzie County Tourism Bureau

McKenzie County Engineer

LIST OF PREPARERS AND CONTRIBUTORS

PREPARERS

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Steven Hoffman	Natural Resource Specialist, National Park Service, Denver Service Center

CONTRIBUTORS

Valerie Naylor	Superintendent, Theodore Roosevelt National Park
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Lynn Heiser	Chief of Facility Management, Theodore Roosevelt National Park
Laurie Richardson	Botanist, Theodore Roosevelt National Park
Mark Meng	Project Manager, Central Federal Lands Highway Division, Federal Highway Administration
Jill Mathewson	Highway Design Engineer, Central Federal Lands Highway Division, Federal Highway Administration
Tony Galardi	Highway Design Engineer, Central Federal Lands Highway Division, Federal Highway Administration

REFERENCES

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2002 *Standard Specifications for Road and Bridge Construction, Volume 1 of 2.*

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APPENDIX A: AGENCY CONSULTATION AND COORDINATION LETTERS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

JAN 19 2017

Mr. William Whitworth
Theodore Roosevelt National Park
P.O. Box 7
Medora, North Dakota 58645

Dear Mr. Whitworth:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter of January 4, 2007, concerning the National Park Service's plans to repair and rehabilitate Scenic Drive in the North Unit of Theodore Roosevelt National Park, McKenzie County, North Dakota. The proposed work consists of resurfacing the 14 mile long scenic route; installing, replacing or relining culverts where necessary; cleaning roadside ditches; and installing guardrail as needed. Other related highway construction activities will be completed as part of this project to improve the quality and safety of Scenic Drive. We offer the following comments to assist with the project planning process in accordance with the provisions of the Endangered Species Act (16 U.S.C. 1531 et seq.) and Executive Order 11990 concerning the protection of wetland resources.

As you are aware, the North Unit of Theodore Roosevelt National Park provides high quality wildlife habitat for a wide array of resident species and migratory birds. We recommend that precautions be taken to minimize impacts to native grasslands, woodlands, and aquatic resources by maintaining existing drainage patterns and culvert elevations. If the project results in impacts to aquatic resources that cannot be avoided, a mitigation plan to offset project losses will need to be developed. Wetland losses should be replaced by restoring or creating an equal or greater acreage of similar wetland habitat. Please provide this office with a copy of the project's mitigation plan if construction will result in unavoidable losses of wetland habitat.

To maintain environmental quality within the project area, the Service recommends implementing the following precautions during construction:

1. Develop and implement a project erosion control plan if upland areas will be disturbed during construction. Silt fences should be installed and maintained at appropriate locations to prevent sediment from accumulating in creek channels and associated riparian areas.

2. Promptly reseed all upland areas that are disturbed during construction with a native grass mixture. On steep slopes, coconut matting or other effective matting material should be

installed to help ensure initial seeding becomes established, thus avoiding the time and effort associated with reseeding.

3. Replace unavoidable losses of trees on a 2:1 basis by planting species native to the area.

A list of federally endangered, threatened, and candidate species that have been documented in McKenzie County is enclosed. This list fulfills requirements of the Fish and Wildlife Service under Section 7 of the Endangered Species Act.

If a Federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its delegated agent, is required to evaluate whether the proposed action "may affect" listed species. If the Federal agency determines the action "may affect" a listed species, then the responsible Federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "no effect" situation on the listed species, further consultation is not necessary. No legal requirement exists to protect candidate species; however, it is within the spirit of the Endangered Species Act to consider these species as having significant value and worth protecting. At this time, we are not aware that any federally listed threatened or endangered species occur in the project area.

A 404 permit may be required if fill material will be placed in aquatic sites, including some wetlands. We suggest you contact Mr. Dan Cimarosti, Regulatory Office, Corps of Engineers, 1513 South 12th Street, Bismarck, North Dakota 58504, (701-255-0015), to determine their permit requirements. If a 404 permit is required, the Service will provide recommendations on this project to the Corps of Engineers.

The Service has no objection to the project as proposed provided recommendations included in this letter are incorporated into the project plan. Thank you for the opportunity to provide comments on the National Park Service's plans to improve Scenic Drive. If further information is required, please contact Bill Bicknell of my staff at 250-4481.

Sincerely,

Jeffrey K. Towner

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosure

cc: COE, Regulatory Office, Bismarck
(Attn: Dan Cimarosti)
Director, ND Game and Fish Dept., Bismarck
(Attn: Mike McKenna)

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

February 14, 2007

Valerie J. Naylor
Superintendent
Theodore Roosevelt National Park
PO Box 7
Medora, ND 58645

NDSHPO REF. : 07-0221 NPS North Unit Scenic Drive Route 10(3), THRO H4217 (THRO)

Dear Valerie:

We have received your recent letter correspondence on : "**07-0221 NPS** North Unit Scenic Drive Route 10(3), THRO."

We look forward to further consultation for this project as it develops and to review of the environmental assessment when completed.

If you have questions please contact either Susan Quinnell at (701) 328-3576 or Paul Picha at (701) 328-3574.

Sincerely,

for Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota

APPENDIX B

Plants Common in Theodore Roosevelt National Park

North Dakota State Listed Noxious Weeds

North Dakota State Plant Species of Concern

Revegetation Project Summary

PLANTS COMMON IN THEODORE ROOSEVELT NATIONAL PARK

Common Grasses in Theodore Roosevelt National Park			
Common Name	**Scientific Name**	**Family**	**Habitat**
Big sandgrass	Calamovilfa longifolia	Grass	Sandy setting
Blue grama	Bouteloua	Grass	Prairie
Buffalo grass	Buchloe dactyloides	Grass	Uplands
Canada wild rye	Elymus canadensis	Grass	Riverbottom/channels
Crested wheatgrass	Agropyron cristatum	Grass	Roadsides
Foxtail barley	Hordeum jubatum	Grass	Alkaline settings
Green needlegrass	Stipa viridula	Grass	Prairie
Junegrass	Koeleria pyramidata	Grass	Prairie
Kentucky bluegrass	Poa pratensis	Grass	Campground
Little bluestem	Andropogon scoparius	Grass	Ridge slopes
Needle-and-thread	Stipa comata	Grass	Prairie
Threadleaf sedge	Carex filifolia	Sedge	Prairie uplands
Saltgrass	Distichlis spicata stricta	Grass	Alkaline settings
Sideoats grama	Bouteloua curtipendula	Grass	Ridge slopes
Smooth brome	Bromus inermis	Grass	Roadsides
Western wheatgrass	Agropyron smithii	Grass	Uplands

Common Shrubs in Theodore Roosevelt National Park				
Common Name	**Scientific Name**	**Family**	**Flowering Time**	**Flower Color**
Big sage/ Three-toothed sage	Artemisia tridentata	Aster		
Buckbrush/Wolfberry	Symphoricarpos occidentalis	Honeysuckle	June-July	White
Buffaloberry/Bullberry	Shepherdia argentea	Oleaster		
Choke cherry	Prunus virginiana	Rose	May-June	White
Common/Shrub juniper/ cedar	Juniperus communis	Cypress		
Creeping juniper/cedar	Juniperus horizontalis	Cypress		
Skunkbush/Fragrant sumac	Rhus aromatica	Cashew	May-June	Yellow
Golden/Buffalo currant	Ribes odoratum	Currant	May	Yellow
Greasewood	Sarcobatus vermiculatus	Goosefoot		
Juneberry/Saskatoon	Amelanchier alnifolia	Rose		
Poison ivy	Toxicodendron rydbergii	Cashew		
Prairie rose (state flower)	Rosa arkansana	Rose	June-July	Pink
Rabbitbrush	Chrysothamnus nauseosus	Aster	Aug-Sept	Yellow
Sandbar willow	Salix interior	Willow		
Shrubby cinquefoil/ Potentilla	Potentilla fruiticosa	Rose	June-Aug	Yellow
Silver sage	Artemisia cana	Aster		
Spiny saltbush	Atriplex confertiflora	Goosefoot		
Wild plum	Prunus americana	Rose	May	White
Winterfat	Ceratoides lanata	Goosefoot		
Wood's rose	Rosa woodsii	Rose	June	Pink

PLANTS COMMON IN THEODORE ROOSEVELT NATIONAL PARK

Common Trees in Theodore Roosevelt National Park			
Common Name	**Scientific Name**	**Family**	**Habitat**
American elm	Ulmus americana	Elm	Riverbottom, draws
Box elder	Acer negundo	Maple	Riverbottom
Cottonwood	Populus deltoides	Willow	Riverbottom
Green ash	Fraxinus pennsylvanica	Olive	Draws, riverbottom
Rocky Mountain juniper/cedar	Juniperus scopulorum	Cypress	North-facing slopes

Common Herbs in Theodore Roosevelt National Park				
Common Name	**Scientific Name**	**Family**	**Flowering Date**	**Flower Color**
Aromatic aster	Aster oblongifolius	Aster	Aug-Sept	Purple
Bastard toadflax	Comandra umbellata	Sandalwood	May-June	White
Bergamot/Beebalm	Monarda fistulosa	Mint	July-Aug	Pink
Blazing star/ Dotted gayfeather	Liatris aspera	Aster	Aug-Sept	Purple
Blue wild lettuce	Lactuca oblongifolia	Aster	June-Sept	Purple
Snakeweed	Gutierrezia sarothrae	Aster	Aug-Sept	Yellow
Butte candle	Cryptantha celosioides	Borage	June	White
Common sunflower	Helianthus annuus	Aster	July-Sept	Yellow
Crested beardtongue	Penstemon eriantherus	Figwort	June	Purple
Curlycup gumweed	Grindelia squarrosa	Aster	July-Sept	Yellow
False Solomon's seal	Smilacina stellata	Lily	June	White
Fetid marigold	Dyssodia papposa	Aster	June-Aug	Yellow
Field bindweed	Convolvulus sepium	Morning Glory	June-July	White
Fringed sage	Artemisia frigida	Aster	Aug-Sept	Yellowish
Goat's beard/ Western salsify	Tragopogon dubius	Aster	June-Aug	Yellow
Golden aster	Chrysopsis villosa	Aster	July-Sept	Yellow
Golden pea	Thermopsis rhombifolia	Pea	May-June	Yellow
Goldenrod	Solidago spp.	Aster	Aug-Sept	Yellow
Ground plum	Astragalus crassicarpus	Bean	May-June	Pink
Gumbo lily	Oenothera caespitosa	Primrose	June	White
Harebell	Campanula rotundifolia	Bellflower	June-July	Purple
Henbane	Hyoscamus niger	Potato	June	Greenish
Indian breadroot/ Tipsin	Psoralea esculenta	Pea	May-June	Purple
Indian paintbrush	Castilleja sessiliflora	Figwort	May-July	Yellow
Large-flowered dock	Rumex venosus	Buckwheat	May-June	Pink
Leafy spurge	Euphorbia esula	Spurge	June-July	Greenish
Leopard lily	Fritillaria atropurpurea	Lily	May	Purple
Moss phlox	Phlox hoodii	Phlox	May-June	White
Northern bedstraw	Galium boreale	Madder	June-July	White
Pincushion cactus	Coryphantha vivipara	Cactus	June	Red
Prickly pear cactus	Opuntia polyacantha	Cactus	June	Yellow
Prince's plume	Stanleya pinnata	Mustard	June	Yellow
Purple coneflower	Echinacea augustifolia	Aster	June-July	Purple
Purple locoweed	Oxytropis lambertii	Pea	May-July	Purple
Purple prairie clover	Dalea purpurea	Pea	July	Purple
Pussytoes	Antennaria spp.	Aster	June	White
Scarlet/ Red globe mallow	Sphaeralcea coccinea	Mallow	June-Sept	Red
Rocky Mountain bee plant	Cleome serrulata	Caper	June-Sept	Pink

PLANTS COMMON IN THEODORE ROOSEVELT NATIONAL PARK

Common Herbs in Theodore Roosevelt National Park				
Common Name	**Scientific Name**	**Family**	**Flowering Time**	**Flower Color**
Scoria lily/ Evening star	Mentzelia decapetala	Stickleaf	July-Aug	White
Sago/Mariposa lily	Calochortus nuttallii	Lily	June-July	White
Scarlet gaura	Gaura coccinea	Primrose	May-Aug	White/red
Showy milkweed	Asclepias speciosa	Milkweed	June-Aug	Pink
Silver-leaf scurf pea	Psoralea argophylla	Pea	June-Sept	Purple
Skeletonweed	Lygodesmia juncea	Aster	June-Sept	Pink
Spreading dogbane	Apocynum androsaemifolium	Dogbane	June-July	White
Stiff sunflower	Helianthus rigidus	Aster	Aug-Sept	Yellow
Tumbling mustard	Sisymbrium altissimum	Mustard	June-Aug	Yellow
Wavy-leaf thistle	Circium undulatum	Aster	June-July	Purple
Western virgin's bower	Clematis ligusticifolia	Buttercup	July-Aug	White
Western wallflower	Erysimum asperum	Mustard	May-July	Yellow
White beardtongue/ penstemon	Penstemon albidus	Figwort	June-July	White
White sage	Artemisia ludoviciana	Aster		
White sweet clover	Melilotus alba	Pea	June-July	White
White wild onion/Prairie onion	Allium textile	Lily	May-June	White
Whorled milkweed	Asclepias verticillata	Milkweed	July-Aug	White
Crocus/Pasque flower	Anemone patens	Buttercup	April-June	Purple
Wild licorice	Glycyrrhiza lepidota	Pea	June	Yell/white
Wooly plantain	Plantago patagonica	Plaintain	June	
Yarrow	Achillea millefolium	Aster	June-July	White
Yellow buckwheat/ umbrella plant	Eriogonum flavum	Buckwheat	May-July	Yellow

NORTH DAKOTA DEPARTMENT OF AGRICULTURE NOXIOUS WEEDS

Common Name	Species	Scientific Name	Habitat	Status	Plant Type
Absinth wormwood	Absinth wormwood	Artemisia absinthium	Upland	Noxious Weeds	Forb
American wormwood	Absinth wormwood	Artemisia absinthium	Upland	Noxious Weeds	Forb
Austrian brome	Smooth brome	Bromus inermis	Upland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Awnless brome	Smooth brome	Bromus inermis	Upland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Beggar's lice	Houndstongue	Cynoglossum officinale	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Forb
Big-head knapweed	Big-headed knapweed	Centaurea macrocephala	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Black henbane	Black henbane	Hyoscyamus niger	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Black medic	Black medic	Medicago lupulina	Upland	Invasive Plants to Ecological Locations	Forb
Brazilian elodea	Brazilian elodea	Egeria densa	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
Buckthorn	Buckthorn	Rhamnus cathartica	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Trees or Shrub
Bull thistle	Bull thistle	Cirsium vulgare	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Bullhead	Puncture vine	Tribulus terrestris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Butter-and-eggs	Yellow toadflax	Linaria vulgaris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
California thistle	Canada thistle	Cirsium arvense	Upland, Wetland	Noxious Weeds	Forb
Canada thistle	Canada thistle	Cirsium arvense	Upland, Wetland	Noxious Weeds	Forb
Caragana	Caragana	Caragana arborescens	Upland	Invasive Plants to Ecological Locations	Trees or Shrub
Cheatgrass	Cheatgrass	Bromus tectorum	Upland	Invasive Plants to Agricultural & Ecological Locations	Grass or Grasslike Species
Common buckthorn	Buckthorn	Rhamnus cathartica	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Trees or Shrub

NORTH DAKOTA DEPARTMENT OF AGRICULTURE NOXIOUS WEEDS

Common Name	Species	Scientific Name	Habitat	Status	Plant Type
Common henbane	Black henbane	Hyoscyamus niger	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Common linaria	Yellow toadflax	Linaria vulgaris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Common toadflax	Yellow toadflax	Linaria vulgaris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Common wormwood	Absinth wormwood	Artemisia absinthium	Upland	Noxious Weeds	Forb
Corn chamomile	Scentless chamomile	Anthemis arvensis	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Corn sowthistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Cotton thistle	Scotch thistle	Onopordum acanthium	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Couch grass	Quackgrass	Elytrigia repens	Upland	Invasive Plants to Agricultural & Ecological Locations	Grass or Grasslike Species
Creeping jenny	Field bindweed	Convolvulus arvensis	Upland	Noxious Weeds	Forb
Creeping sowthistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Creeping thistle	Canada thistle	Cirsium arvense	Upland, Wetland	Noxious Weeds	Forb
Crested wheatgrass	Crested wheatgrass	Agropyron cristatum	Upland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Curled pondweed	Curly-leaf pondweed	Potamogeton crispus	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
Curly leaf pondweed	Curly-leaf pondweed	Potamogeton crispus	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
Curly pondweed	Curly-leaf pondweed	Potamogeton crispus	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
Dalmatian toadflax	Dalmatian toadflax	Linaria genistifolia	Upland	Noxious Weeds	Forb
Devil's paintbrush	Orange hawkweed	Hieracium aurantiacum	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Diffuse knapweed	Diffuse knapweed	Centaurea diffusa	Upland	Noxious Weeds	Forb

NORTH DAKOTA DEPARTMENT OF AGRICULTURE NOXIOUS WEEDS

Common Name	Species	Scientific Name	Habitat	Status	Plant Type
Dindle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Dog bur	Houndstongue	Cynoglossum officinale	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Forb
Dog's tongue	Houndstongue	Cynoglossum officinale	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Forb
Downy brome	Cheatgrass	Bromus tectorum	Upland	Invasive Plants to Agricultural & Ecological Locations	Grass or Grasslike Species
Eurasian water milfoil	Eurasian water milfoil	Myriophyllum spicatum	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
European buckthorn	Buckthorn	Rhamnus cathartica	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Trees or Shrub
Fair dale daisy	Scentless chamomile	Anthemis arvensis	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
False chamomile	Scentless chamomile	Anthemis arvensis	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Field bindweed	Field bindweed	Convolvulus arvensis	Upland	Noxious Weeds	Forb
Field milk thistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Field sowthistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Fleeceflower	Japanese knotweed	Polygonum cuspidatum	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Fuller's thistle	Bull thistle	Cirsium vulgare	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Garlic mustard	Garlic mustard	Alliaria petiolata	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Giant knotweed	Giant knotweed	Polygonum sachalinense	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Glovewort	Houndstongue	Cynoglossum officinale	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Forb
Goathead	Puncture vine	Tribulus terrestris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb

NORTH DAKOTA DEPARTMENT OF AGRICULTURE NOXIOUS WEEDS

Common Name	Species	Scientific Name	Habitat	Status	Plant Type
Gutweed	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Heart-podded hoary cress	Hoary cress	Cardaria draba	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Hedge garlic	Garlic mustard	Alliaria petiolata	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Hoary cress	Hoary cress	Cardaria draba	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Hogbane	Black henbane	Hyoscyamus niger	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Hogbean	Black henbane	Hyoscyamus niger	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Houndstongue	Houndstongue	Cynoglossum officinale	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Forb
Hungarian brome	Smooth brome	Bromus inermis	Upland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Hybrid cattail	Hybrid cattail	Typha glauca	Wetland	Invasive Plants to Agricultural & Ecological Locations	Grass or Grasslike Species
Insane root	Black henbane	Hyoscyamus niger	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Jacob's ladder	Yellow toadflax	Linaria vulgaris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Japanese bamboo	Japanese knotweed	Polygonum cuspidatum	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Japanese brome	Japanese brome	Bromus japonicus	Upland	Invasive Plants to Agricultural & Ecological Locations	Grass or Grasslike Species
Japanese knotweed	Japanese knotweed	Polygonum cuspidatum	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Kentucky bluegrass	Kentucky bluegrass	Poa pratensis	Upland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Lance-leafed thistle	Bull thistle	Cirsium vulgare	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Leafy spurge	Leafy spurge	Euphorbia esula	Upland	Noxious Weeds	Forb
Madder wort	Absinth wormwood	Artemisia absinthium	Upland	Noxious Weeds	Forb

NORTH DAKOTA DEPARTMENT OF AGRICULTURE NOXIOUS WEEDS

Common Name	Species	Scientific Name	Habitat	Status	Plant Type
Meadow hawkweed	Meadow hawkweed	Hieracium pratense	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Meadow knapweed	Meadow knapweed	Centaurea debeauxii	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Mexican sandbur	Puncture vine	Tribulus terrestris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Milk thistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Mugwort	Absinth wormwood	Artemisia absinthium	Upland	Noxious Weeds	Forb
Musk thistle	Musk thistle	Carduus nutans	Upland	Noxious Weeds	Forb
Narrow-leaved cattail	Narrowleaved cattail	Typha angustifolia	Wetland	Invasive Plants to Agricultural & Ecological Locations	Grass or Grasslike Species
Nodding thistle	Musk thistle	Carduus nutans	Upland	Noxious Weeds	Forb
Oleaster	Russian olive	Elaeagnus angustifolia	Upland, Wetland, Woodland	Invasive Plants to Ecological Locations	Trees or Shrub
Orange hawkweed	Orange hawkweed	Hieracium aurantiacum	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Orange paintbrush	Orange hawkweed	Hieracium aurantiacum	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Perennial morningglory	Field bindweed	Convolvulus arvensis	Upland	Noxious Weeds	Forb
Perennial pepper-grass	Hoary cress	Cardaria draba	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Perennial sowthistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Plumeless thistle	Plumeless thistle	Carduus acanthoides	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Puncturevine	Puncture vine	Tribulus terrestris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Purple loosestrife	Purple loosestrife	Lythrum salicaria	Wetland	Noxious Weeds	Forb
Purple lythrum	Purple loosestrife	Lythrum salicaria	Wetland	Noxious Weeds	Forb
Quackgrass	Quackgrass	Elytrigia repens	Upland	Invasive Plants to Agricultural & Ecological Locations	Grass or Grasslike Species

NORTH DAKOTA DEPARTMENT OF AGRICULTURE NOXIOUS WEEDS

Common Name	Species	Scientific Name	Habitat	Status	Plant Type
Reed canarygrass	Reed canarygrass	Phalaris arundinacea	Wetland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Russian brome	Smooth brome	Bromus inermis	Upland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Russian knapweed	Russian knapweed	Acroptilon repens	Upland	Noxious Weeds	Forb
Russian olive	Russian olive	Elaeagnus angustifolia	Upland, Wetland, Woodland	Invasive Plants to Ecological Locations	Trees or Shrub
Saltcedar	Saltcedar	Tamarix chinensis, T. parviflora, T. ramosissima	Upland, Wetland, Woodland	Noxious Weeds	Trees or Shrub
Scentless chamomile	Scentless chamomile	Anthemis arvensis	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Scentless mayweed	Scentless chamomile	Anthemis arvensis	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Scotch thistle	Scotch thistle	Onopordum acanthium	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Sheep's lice	Houndstongue	Cynoglossum officinale	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Forb
Siberian elm	Siberian elm	Ulmus pumila	Upland	Invasive Plants to Ecological Locations	Trees or Shrub
Siberian peashrub	Caragana	Caragana arborescens	Upland	Invasive Plants to Ecological Locations	Trees or Shrub
Silver berry	Russian olive	Elaeagnus angustifolia	Upland, Wetland, Woodland	Invasive Plants to Ecological Locations	Trees or Shrub
Smooth brome	Smooth brome	Bromus inermis	Upland	Invasive Plants to Ecological Locations	Grass or Grasslike Species
Sowthistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Spear thistle	Bull thistle	Cirsium vulgare	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Spotted knapweed	Spotted knapweed	Centaurea maculosa	Upland	Noxious Weeds	Forb
Swine-thistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Tackweed	Puncture vine	Tribulus terrestris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Tamarisk	Saltcedar	Tamarix chinensis, T. parviflora, T. ramosissima	Upland, Wetland, Woodland	Noxious Weeds	Trees or Shrub

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Common Name	Species	Scientific Name	Habitat	Status	Plant Type
Texas sandbur	Puncture vine	Tribulus terrestris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Toadflax	Yellow toadflax	Linaria vulgaris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Tree sowthistle	Sowthistle	Sonchus arvensis	Upland, Wetland	Invasive Plants to Agricultural & Ecological Locations	Forb
Twoleaf watermilfoil	Twoleaf watermilfoil	Myriophyllum heterophyllum	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
Variable-leaf milfoil	Twoleaf watermilfoil	Myriophyllum heterophyllum	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
Water milfoil	Twoleaf watermilfoil	Myriophyllum heterophyllum	Aquatic	Invasive Plants to Agricultural & Ecological Locations	Forb
Whitetop	Hoary cress	Cardaria draba	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Wild morningglory	Field bindweed	Convolvulus arvensis	Upland	Noxious Weeds	Forb
Wild olive	Russian olive	Elaeagnus angustifolia	Upland, Wetland, Woodland	Invasive Plants to Ecological Locations	Trees or Shrub
Wild snapdragon	Yellow toadflax	Linaria vulgaris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Woolly thistle	Scotch thistle	Onopordum acanthium	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb
Woolmat	Houndstongue	Cynoglossum officinale	Upland, Woodland	Invasive Plants to Agricultural & Ecological Locations	Forb
Wormwood Sage	Absinth wormwood	Artemisia absinthium	Upland	Noxious Weeds	Forb
Yellow starthistle	Yellow starthistle	Centaurea solstitialis	Upland	Noxious Weeds	Forb
Yellow sweetclover	Yellow sweetclover	Melitotus officinalis	Upland	Invasive Plants to Ecological Locations	Forb
Yellow toadflax	Yellow toadflax	Linaria vulgaris	Upland	Invasive Plants to Agricultural & Ecological Locations	Forb

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Acorus americanus	Sweetflag	S3	G5	Bott, McHe, Rans	Peatlands, fens, and seeps.
Allium canadense L.	Meadow onion	S1	G5	Sarg	Prairies, open woods.
Allium tricoccum Ait.	Wild garlic	SU	G5	Rich	Rich undisturbed woods.
Apios americana Medik.	American groundnut	SH	G5	Rans	Moist woods, thickets, banks.
Arabis canadensis L.	Sicklepod	S1	G5	Sarg	Mesic woodlands.
Arnica cordifolia Hook.	Heart-leaved arnica	SH	G5	Loga	Open woodlands.
Asclepias lanuginosa	Wooly milkweed	S1	G4?	Dunn, Grnt, McHe, Star, Stut	Sandy or rocky calcareous prairie.
Asclepias sullivantii Engelm. ex Gray	Sullivant's milkweed	SH	G5	Cass, Rich	Mesic tallgrass prairies.
Astragalus drummondii Dougl. ex Hook.	Drummond's milkvetch	S1	G5	Gfor, Will	Open or wooded hillsides, ravines.
Astragalus neglectus (Torr. and Gray) Sheldon	Cooper's milkvetch	S1	G4	Pemb	Sandy, gravelly shores, mesic gravelly prairies.
Astragalus vexilliflexus Sheldon	Bent-flowered milkvetch	S3	G4	Dunn, Slop, Star	Barren badland slopes and buttes.
Athyrium filix-femina Roth	Northern lady-fern	S3	G5	Cava, Gfor, Pemb, Rans, Rich	Moist woods, thickets, bogs, along streams.
Boisduvalia glabella (Nutt.) Walp.	Smooth-spike primrose	S1S2	G5	Bill, Hett	Along streams and early-drying vernal pools.

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Botrychium campestre W.H. Wagner & Farrar ex. W.H. & F.Wagner	Prairie grapefern	S1	G3G4	McHe	Dry, gravelly or sandy prairie.
Botrychium matricariifolium (A. Braun ex Dowell)A. Braun ex Koch	Chamomile grapefern	S1S2	G5	McHe, Ward	Moist woodlands.
Botrychium minganense Victorin	Moonwort	S1	G4	Bott, Burk, Cava, Rans	Wooded, often north-facing slopes, meadows.
Botrychium multifidum (Gmel.) Trev.	Leathery grapefern	S1	G5	Cava	Wet meadows, rich woodlands.
Botrychium simplex E. Hitchc.	Least grapefern	SU	G5	Rans	Meadows, barrens, and woods; subacid soils.
Bromus kalmii Gray	Kalm's brome	SU	G5	Cava, Pemb	Open oak woods, sandy soils.
Calla palustris L.	Water arum	S2	G5	Pemb, Role	Northern marshes and swamps.
Campanula aparinoides Pursh	Marsh bellflower	S2S3	G5	Pemb, Rans, Rich	Wetland thickets, seepage peatlands.
Cardamine bulbosa (Schreb. ex Muhl.) B.S.P.	Spring cress	S1	G5	Rans	Wet meadows and woods, springs.
Carex alopecoidea Tuckerman	Foxtail sedge	S2	G5	Barn, Bott, Pemb, Rans Rich, Role	Damp, rich, wooded areas.
Carex athrostachya Olney	Jointed-spike sedge	S3	G5	Bens, Divi, Moun, Will	Low prairie, marsh margins.
Carex backii Boott	Back's sedge	S2S3	G4	Bott, Burk, Cava	Damp, wooded areas.

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Carex brunnescens (Pers.) Poir.	Brown sedge	S1	G5	McHe	Fens, wet wooded areas.
Carex buxbaumii Wahlenb.	Buxbaum's sedge	S1S2	G5	Barn, Stut	Wet meadows, fens.
Carex capillaris L.	Hair-like sedge	S1S2	G5	Bott, McHe	Wet meadows, fens.
Carex chordorrhiza Ehrh. ex L. F.	Creeping sedge	S1	G5	Bott	Sphagnum bogs, poor fens.
Carex convoluta Mackenzie	Spiral sedge	S1	G5	Sarg	Rich, deciduous woodlands.
Carex diandra Schrank	Lesser-panicled sedge	S2S3	G5	Bott, Burk, Gfor, Role	Swamps, meadows, shores.
Carex echinata ssp echinata	Spiny sedge	S1	G5T5	Bott	Sphagnum bogs.
Carex festucacea Schkuhr ex Willd.	Fescue sedge	SU	G5	Cass	Wooded area.
Carex foenea Willd.	Dry-spiked sedge	S1S2	G5	Bott, Dunn	Aspen woods, ravines.
Carex formosa Dewey	Handsome sedge	S1	G4	Rich	Low, moist, eastern woodlands.
Carex garberi Fern.	Elk sedge	S1S2	G5	Bens, Burk, McHe	Fens, swamps, pond margins.
Carex gracillima Schwein.	Graceful sedge	S1	G5	Pemb	Moist swampy woods.
Carex gynocrates Wormskj. ex Drej.	Pistillate sedge	S1	G5	McHe	Peaty fens.
Carex haydenii Dewey	Hayden's sedge	S1	G5	Dunn	Wet meadows, sloughs.

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Carex lasiocarpa Ehrh.	Wiregrass sedge	S3	G5	Bott, Gfor, McHe, Rans, Rich	Sphagnum bogs, seepage-fed peatlands, lake borders.
Carex leptalea Wahlenb.	Delicate sedge	S2S3	G5	Cava, McHe, Pemb, Rans, Rich	Shrubby peatland fens, swampy woods and thickets.
Carex limosa L.	Mud sedge	S2	G5	Bott, Mche	Sphagnum bogs, fens.
Carex nebrascensis Dewey	Nebraska sedge	S2	G5	Emmo, Lamo, Slop	Wet meadows, stream margins.
Carex pedunculata Muhl. ex Willd.	Peduncled sedge	S1S2	G5	Cava	Moist oak or birch woodlands.
Carex richardsonii R. Br.	Richardson's sedge	S1	G4	Cass, McHe, Rich	Low, usually sandy, prairie.
Carex scirpoidea Michx.	Spikerush sedge	S1S2	G5	Dunn, McHe, Role	Rocky slopes, wet meadows.
Carex scoparia Schkuhr ex Willd.	Pointed broom sedge	SH	G5	Bens, Gfor, Stut, Wals	Damp woods, low prairie, lakeshores.
Carex simulata Mackenzie	Copycat sedge	S2	G5	Burk, Divi, McHe	Calcareous fens, wet meadow.
Carex sterilis Willd.	Sterile sedge	S1S2	G4	McHe	Seepage peatland fens, wet meadows.
Caulophyllum thalictroides (L.) Michx.	Blue cohosh	S1	G4G5	Cass, Rans Rich, Role	Moist rich woods.
Chaenactis douglasii (Hook.) Hook. & Arn.	Douglas' dusty-maiden	S2	G5	Bill, Gold	Scoria slopes and buttes.
Cheilanthes feei T. Moore	Slender lip fern	S1	G5	Dunn	Dry rocky slopes, on sandstone or limestone.

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Chenopodium subglabrum (S. Wats.) A. Nels.	Smooth goosefoot	S1	G3G4	Bill, Slop	Sandy river banks and terraces.
Clematis columbiana var tenuiloba (Gray) J. Pringle	Slender-lobed clematis	S1	G5?T4?	Dunn	Rocky slopes, limestone soil.
Collinsia parviflora Lindl.	Blue lips	S2	G5	Bill, Dunn, Slop	Mesic slopes of buttes.
Crataegus mollis Scheele	Downy hawthorn	S1	G5	Cass, Gfor, Rans	Open mesic woods.
Cryptantha torreyana (Gray) Greene	Torrey's cryptantha	S1	G5	Bill, Bowm	Butte slopes, on scoria.
Cyperus bipartitus Torr.	Brook flatsedge	S1S2	G5	Cass, Rans, Rich, Stut	Cool, spring-fed streams.
Cyperus diandrus Torr.	Low flatsedge	S2S3	G5	Rans, Rich	Sandy or muddy shores, stream margins.
Cypripedium candidum Muhl. ex Willd.	White lady's-slipper	S2S3	G4	Bens, Cass, Eddy, Gfor, Grig, Nels, Rans Rich, Role, Sarg, Wals	Low prairie, wet meadows.
Cypripedium parviflorum Salisb.	Small yellow lady's- slipper orchid	S2S3	G5	Bens, Bott, Cava, Dunn, Gfor, McHe, Pemb, Rans, Role, Sarg, Wals	Damp woods, fens, stream banks.
Cypripedium planipetalum (Fern.) Morris & Eames	Large yellow lady's- slipper orchid	S2	G2Q	Bens, Eddy, Rans, Role	Boggy areas, wet prairies.
Cypripedium reginae Walt.	Showy lady's-slipper	S2S3	G4	Bens, Cava, Eddy, Pemb, Rans, Rich	Swampy woodlands and thickets, fens.

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Dalea enneandra Nutt.	Nine-anthered dalea	S2S3	G5	Bill, Grnt, Merc, Mort, Siou	Sandy or gravelly slopes, dry mixed grass prairie.
Desmanthus illinoensis (Michx.) Macm. ex B. L. Robins. & Fern	Prairie mimosa	S1	G5	Emmo, Sarg	Prairies with rocky or sandy soil.
Dicentra cucullaria (L.) Bernh.	Dutchman's breeches	S1	G5	Gfor, Rans, Sarg	Rich eastern woodlands.
Diervilla lonicera P. Mill.	Dwarf honeysuckle	S1	G5	Cava	Shady woods, usually aspen.
Dirca palustris L.	Leatherwood	S1	G4	Cava	Shady, damp woodland slopes.
Drosera rotundifolia L.	Round-leaved sundew	S1	G5	Bott	Acid bogs, swamps.
Dryopteris carthusiana (Vill.) H.P. Fuchs	Spinulose woodfern	S3	G5	Cava, Pemb, Rans, Rich	Rich, moist woods, ravines, boggy areas, alder thickets.
Dryopteris cristata (L.) Gray	Crested woodfern	S3	G5	Bott, Cass, Cava, Pemb, Rans, Rich	Swampy woods and thickets, seeps.
Eleocharis parvula (Roemer & J.A. Schultes) Link ex Bluff., Nees & Schauer	Dwarf spikerush	S1S2	G5	Burl, Gfor, Nels, Sarg	Brackish or alkaline shores.
Eleocharis pauciflora (Lightf.) Link	Few-flowered spikerush	S2S3	G5	Bens, Burk, Kidd, McHe, Role, Stut, Well	Calcareous fens and seeps.
Eleocharis wolfii (Gray) Gray ex Britt.	Wolf's spikerush	SH	G3?	Cass	Shores, low, wet prairie.

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Elymus glaucus Buckl.	Blue wildrye	S1	G5	Bott, McHe	Open woods, prairie slopes.
Epilobium coloratum Biehler	Purple-leaved willowherb	SU	G5	Rans, Rich, Stut	Marshes, seeps, shores.
Equisetum palustre L.	Marsh horsetail	S2	G5	Rans, Rich	Willow or alder thickets, swampy woods, stream banks.
Equisetum pratense Ehrh.	Meadow horsetail	S2	G5	Barn, Cass, Pemb, Rans, Rich	Moist boggy woods, shady river banks and shores.
Equisetum sylvaticum L.	Wood horsetail	S2	G5	Bens, Cava, Pemb	Moist aspen or lowland woods, seeps.
Equisetum variegatum Schleich. ex F. Weber & D.M.H. Mohr	Variegated horsetail	S1	G5	McHe	Marl pools of calcareous fens.
Erigeron divergens Torr. & Gray	Spreading fleabane	S1	G5	Gold, Nels	Dry, open rocky or sandy sites, buttes.
Erigeron radicatus Hook.	Cushion fleabane	S1	G3	Dunn	Dry, exposed hillsides, buttes at higher elevations.
Eriogonum cernuum Nutt.	Nodding buckwheat	S1	G5	Dunn, Slop	Buttes on scoria or limestone.
Eriogonum visheri A. Nels.	Dakota buckwheat	S2S3	G3	Bill, Gold, Grnt, McKe, Moun, Siou, Slop	Clayey badland buttes and slopes, sandy-clay outwash areas.
Eriophorum chamissonis C.A. Mey.	Chamisson's cottongrass	S1	G5	Barn, Bott, Lamo, McHe, Role	Bogs, marshes, peaty fens.
Eriophorum gracile W.D.J. Koth	Slender cottongrass	S1	G5	Rans	Seepage fens.

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Eriophorum viridicarinatum (Engelm.) Fern.	Green keeled cottongrass	S1	G5	Bott, Pemb, Rans	Sphagnum bogs, peaty fens.
Euonymus atropurpureus Jacq.	Wahoo	S2	G5	Rans, Rich	Rich deciduous woods, woodland edges, river banks.
Euphorbia robusta (Engelm.)	Rocky mountain spurge	S1	G5	Bill	Dry, sandy or gravelly prairie slopes.
Fraxinus nigra Marsh.	Black ash	S2	G5	Cava, Pemb	Swampy or wet lowland woods.
Fritillaria pudica (Pursh) Spreng.	Yellow fritillary	SH	G5	Bill, Mort	Ephemerally moist areas of buttes.
Galium labradoricum (Wieg.) Wieg.	Bog bedstraw	S3	G5	Bott, McHe, Rans, Rich	Wetland thickets, fens, swampy woods.
Gentianopsis crinita (Froel.) Ma	Fringed gentian	S1	G5	Burk, Eddy, Kidd, Pemb, Town	Low wet prairies, stream banks.
Geranium maculatum L.	Wild geramium	SH	G5	Cass	Rich, eastern, deciduous woods.
Geum rivale L	Water avens	SH	G5	Pemb	Marshes, wet meadows, river banks.
Gymnocarpium dryopteris (L.) Newman	Oakfern	S1	G5	Cava, Rans	North-facing or shady wooded slopes.
Halenia deflexa (Sm.) Griseb.	Spurred gentian	S2S3	G5	Cava, Pemb	Wetland thickets, damp shady woods.
Helianthemum bicknellii Fern.	Bicknell's sunrose	S1	G5	Pemb, Rans	Open woods, prairies, usually dry sandy soil.
Hudsonia tomentosa Nutt.	Wooly beach-heather	S1	G5	Rans	Sand prairies and dunes.

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Iris missouriensis Nutt.	Rocky mountain iris	S2	G5	Burl, Emmo, Kidd, Loga	Mesic areas within mixed grass prairie.
Juncus brevicaudatus (Engelm.) Fern.	Short-tailed rush	S2	G5	Bott, McHe	Wet meadows, fens, marshes.
Juncus vaseyi Engelm.	Vasey's rush	SH	G5?	Bott	Wet meadows, shores.
Lappula cenchrusoides	Stickseed	S1	G4	Bill, Dunn, McKe, Siou, Slop, Will	Dry soils in the open.
Lechea stricta Leggett ex Gray	Upright pinweed	S1	G4?	Bowm, Rans, Rich	Dry, sandy woods and prairie.
Leersia verginica Eilld.	Whitegrass	SU	G5	Rich	Moist woods, stream banks.
Leucocrimum montanum Nutt. ex Gray	Sand lily	S2	G5	Bill, Bowm, Gold, Slop	Dry prairie, sandy or clay soils.
Linnaea borealis L.	Twinflower	S4	G5	Bott, Cava, Dunn	Moist, wooded, (north-facing) slopes.
Liparis loeselii (L.) L. C. Rich.	Loesel's twayblade	S2	G5	Bens, Kidd, Pemb, Rans, Stut	Damp woods, prairie swales, fens.
Lipocarpha micrantha (Vahl) G. Tucker	Small-flowered lipocarpha	S1?	G5	Cass	Wet sandy areas, sandbars.
Mehonia repens (Lindl.) G. D	Creeping barberry	S2	G5	Bill, Bowm	Coulees, slopes of high plains.
Mentzelia pumila Nutt. ex Torr. & Gray	Dwarf mentzelia	S1	G4	Slop	Dry sandy or clayey soils.
Menyanthes trifoliata L.	Buckbean	S3	G5	Bott, McHe, Rans	Sphagnum bogs, fen peatlands.

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Mimulus guttatus DC.	Yellow monkeyflower	S1	G5	Gfor	Marshes, along streams and lake shores.
Minuartia dawsonensis (Britt.) House	Stiff sandwort	S1	G5	Cava	Open rocky or gravelly areas, on shale.
Mitella nuda L.	Naked mitrewort	S3	G5	Cava, Pemb, Role	Swampy lowland woods and thickets.
Monotropa uniflora L.	Indianpipe	S3	G5	Bott, Cava, Dunn, Rans, Role	Rich shady woods.
Muhlenbergia filiformis (Thurb. ex S.Wats.) Rydb.	Pull-up muhly	S1	G5	Burk	Marl pools of calcareous fens.
Myosurus aristatus Benth	Sedge mousetail	S1	G5	Slop, Ward, Will	Moist areas, vernal wetlands of mixed grass prairies.
Myriophyllum pinnatum (Walt.) B.S.P.	Cutleaf watermilfoil	S2S3	G5	Barn, Lamo, Loga, Stut	Shallows of marshes and shores.
Najas guadalupensis (Spreng.) Magnus	Southern naiad	S1	G5	Emmo	Lakes or streams.
Najas marina L.	Spiny naiad	S1	G5	Emmo, Rich	Alkaline lakes, ponds.
Oenothera rhombipetala Nut. ex Torr. & Gray	Rhombic evening-primrose	SA	G4G5	Gfor, Rich	Sandy prairies.
Onoclea sensibilis L.	Sensitive fern	S2S3	G5	Pemb, Rans, Rich, Sarg	Wetland thickets, fen peatlands, damp, shady woodlands.
Ophioglossum pusillum Raf.	Adder's-tongue fern	S2	G5	Rans, Rich	Low prairie swales.

NORTH DAKOTA PLANT SPECIES OF CONCERN 2006
North Dakota Natural Heritage Inventory

Scientific Name	Common Name	State Rank	Heritage Global Rank	NDNHI Occurrence Distribution	Habitat
Orobanche uniflora L.	One-flowered broom-rape	SH	G5	Cass	Damp woods and thickets.
Oryzopsis pungens (Torr. ex Spreng.) A.S. Hitchc.	Slender mountain-ricegrass	S1	G5	Cava	Xeric slopes, usually shale.
Oxytropis deflexa (Pallas) DC	Drooping locoweed	S1S2	G5	Bott, Cava, Pemb, Role	Sandy lake shores, low meadows, aspen woodland clearings.
Oxytropis sericea Nutt.	White locoweed	S1	G5	Bens, Bill, Slop	Mixed grass prairie on slopes or buttes.
Parnassia palustris var. parviflora (DC) Boivin	Small-flowered grass-of-Parnassus	SH	G4	Bott	Calcareous fens or bogs.
Pellaea glabella Mett. ex Kuhn	Smooth cliffbrake	S4	G5	Adam, Bowm, Dunn, Gold, Grnt, Hett, McKe, Mort, Oliv	Sandstone caprock of buttes and ledges.
Penstemon procerus Dougl. ex Graham	Small-flowered penstemon	S1	G5	Burk	Northern prairie slopes.
Petasites frigidus (L.) Fries	Sweet coltsfoot	S2	G5	Bott, Cava	Damp meadows and woods.
Phlox alyssifolia Greene	Alyssum-leaved phlox	S1S2	G5	Bill, Gold, Will	Sandy, gravelly, or clayey slopes and ridges, buttes.
Phlox pilosa L.	Downy phlox	SH	G5	Cass, Rich	Mesic prairies of open woods.
Pinus flexilis James	Limber pine	S1	G5	Bill, Slop	Exposed scoria ridge.
Platanthera clavellata (Michx.) Luer	Green woodland orchid	SH	G5	Gfor	Swampy woods, bogs.

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Platanthera praeclara Sheviak & Bowles	Western prairie fringed orchid	S2	G2	Rans, Rich	Moist prairie swales of sandhills.
Pogonia ophioglossoides (L.) Ker-Gawl	Rose pogonia	SH	G5	Gfor	Bogs, swampy woods.
Polygonum hydropiperoides Michx.	Swamp smartweed	S1	G5	Pemb	Rooted in or near water.
Polygonum leptocarpum B. L. Robins.	Thin-fruited knotweed	S1	G2G4Q	Grnt	Damp or dry soils, on clay.
Polygonum punctatum Ell.	Dotted smartweed	S2S3	G5	Cava, Emmo, Gfor, Rich	Swampy thickets, river banks, wet meadows.
Polygonum sagittatum L.	Arrow-leaved tearthumb	SH	G5	Bott	Marshes, wet meadows.
Populus x acuminata Rydb.	Lanceleaf cottonwood	S2	HYB	Bill, Slop	Riparian areas, slopes.
Potamogeton diversifolius Raf.	Water-thread pondweed	S2S3	G5	Bill, Emmo, Slop, Stut	Shallow ponds, marshes.
Potamogeton filiformis Pers.	Slender pondweed	S2S3	G5	Barn, Divi, Rams	Shallow lakes, ponds, and streams.
Potamogeton natans L.	Floating pondweed	S2	G5	Bott, Bruk, Role	Cold, shallow to deep lakes and streams.
Potamogeton praelongus Wulfen	White-stemmed pondweed	S1	G5	Bott, Ward	Usually cool, deep water of lakes.
Potamogeton strictifolius Benn.	Narrow-leaved pondweed	S1	G5	Bott, McHe	Shallow lakes, streams.
Potamogeton vaginatus Turcz.	Sheathed pondweed	S3	G5	Bott, Gfor, Kidd, Oliv, Role, Stut	Usually deep cold lakes, ponds.
Potentilla diversifolia Lehm.	Mountain meadow cinquefoil	S1	G5	Bill, Slop, Star	Along drainages, meadows.

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Scientific Name	Common Name	State Rank	Heritage Global Rank	NDNHI Occurrence Distribution	Habitat
Potentilla palustris (L.) Scop.	Purple cinquefoil	S2	G5	Bott, Gfor, McHe	Fens, wet meadows, bogs.
Potentilla tridentata Ait.	Three-toothed cinquefoil	S1	G5	Bill, Cava	Open dry, outcrops, on shale or scoria.
Primula incana M. E. Jones	American primrose	S1S2	G4G5	Burk, Divi, Moun	Alkali wet meadows, fens.
Psoralea tenuiflora Pursh	Slim-flowered scurfpea	SH	G5	Bowm	Dry prairie, high plains.
Ranunculus cardiophyllus Hook.	Heart-leaved buttercup	S1	G4G5	McKe, Will	Wet meadows, seeps.
Ranunculus flammula L.	Acrid spearwort	S1	G5	Burk	Marshes, damp shores.
Ranunculus recurvatus Poir.	Hooked crowfoot	S1	G5	Gfor, Rich	Wooded ravines, swampy woods.
Rhynchospora capillacea Torr.	Hair beakrush	S2	G4G5	Bens, Bott, McHe, Stut, Well	Calcareous fens, seeps.
Ribes cynosbati L.	Prickly gooseberry	S3	G5	Barn, Cass, Gfor, Rans, Rich	Moist rich woods.
Rorippa calycina (Engelm.) Rydb.	Hayden's yellowcress	SH	G3	McKe	Riverbanks, shores.
Salix maccalliana Rowlee	Swamp willow	S1	G5?	Bott	Bogs, swamps.
Salix pedicellaris Pursh	Bog willow	S3	G5	Bens, Bott, McHe, Rans, Role	Sphagnum bogs, fens.
Sanicula gregaria Bickn.	Cluster sanicle	SH	G4Q	Rich	Rich, moist woodlands.
Scheuchzeria palustris L.	Scheuchzeria	S1	G5	Bott	Sphagnum bogs.

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Scientific Name	Common Name	State Rank	Heritage Global Rank	NDNHI Occurrence Distribution	Habitat
Selaginella rupestris (L.) Spring	Ledge spike-moss	S1	G5	Pemb	Sandy soils, near oak woods.
Senecio eremophilus Richards.	Northern ragwort	S2	G5	Bott, Role	Open sites in aspen woodlands.
Smilax ecirrhata (Engelm. S. Wats. ex Kunth)	Upright greenbrier	S1S2	G5?	Bott, Gold	Rich woods, thickets.
Solidago flexicaulis L	Zigzag goldenrod	S1S2	G5	Cass, Rans, Rich, Sarg	Rich deciduous woods.
Solidago riddellii Frank ex Riddell	Riddell's goldenrod	SH	G5	Rich	Low prairies, wet meadows.
Spiranthes cernua (L.) L.C. Rich.	Nodding ladies'-tresses	S1	G5	Bens, McHe, Rich, Stut	Fens, low prairies.
Spiranthes romanzoffiana Cham.	Hooded ladies'-tresses	S1	G5	Bens, Burk, McHe	Fens, wet meadows.
Sporobolus airoides (Torr.) Torr.	Alkaki sacaton	S2	G5	Bill, Bowm, Gfor, Slop	Moist or drying soil, alkali seeps.
Stephanomeria tenuifolia (Raf.) Hall	Narrow-leaved wirelettuce	SU	G5	Bill, Slop	Dry, clay outcrops.
Talinum parviflorum Nutt.	Prairie fameflower	S2	G5	Grnt, Mort, Siou, Slop	Sandy outcrops, butte slopes.
Thelesperma subnudum var. marginatum (Rydb.) T.E. Melchert ex Cronq.	Greenthread	S2S3	G5T5	Divi, Will	Sandy prairie, open plains.
Thelypteris palustris Schott	Marsh fern	S3	G5	Kidd, McHe, Pemb, Rans, Rich	Wetland thickets, shrubby fens.
Tofieldia glutinosa (Michx.) Pers.	Sticky false-asphodel	S1	G5	Bens	Fens, wet meadows.

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Scientific Name	Common Name	State Rank	Heritage Global Rank	NDNHI Occurrence Distribution	Habitat
Townsendia hookeri Beaman	Hooker's townsendia	S1	G5	Bill	Butte summits.
Triplasis purpurpea (Walt.) Chapman	Purple sandgrass	S1	G4G5	Rans, Rich	Sandy prairies, blowouts.
Utricularia intermedia Hayne	Flat-leaved bladderwort	S2	G5	Bott, McHe, Pemb	Calcareous fens, seepage peatlands.
Utricularia minor L.	Lesser bladderwort	S2S3	G5	Bens, Burk, Eddy, Kidd, McHe, Pemb, Stut	Calcareous fens, seeps.
Uvularia sessilifolia L.	Sessile-leaved bellwort	S1	G5	Cass, Cava	Rich deciduous woods.
Veronicastrum virginicum (L.) Farw.	Culver's-root	SH	G4	Pemb	Low prairie, rich woods.
Viola conspersa Reichenb.	Bog violet	S2S3	G5	Bill, Cass, Dunn, Gfor, Rans, Rich	Moist woods, stream banks.
Viola incognita Brainerd	Large-leaved white violet	SH	G4G5	Pemb	Moist woods.
Wolffia columbiana Karst.	Southern watermeal	S2	G5	Cava, Pemb, Rich, Ward	Aquatic in quiet water.

REVEGETATION PROJECT SUMMARY

North Unit Road Project

Park:	Theodore Roosevelt National Park
Package Title:	Rehabilitate Scenic Drive-NU
PMIS Number:	63939
FWY Number:	
Prepared by:	Laurie Richardson, THRO, Russ Haas DSC-NRCS
Construction Date:	FY11-15

Description/Objective:
The project consists of rehabilitating the North Unit Scenic Drive of Theodore Roosevelt National Park. The rehabilitation will include recycling the existing 14 miles of asphalt roadway, resurfacing roadway with an asphalt overlay, replacing/relining culverts as required, cleaning roadside ditches and replacing or installing guardrail as required and/or needed.

Plant Materials Methods:
Revegetating areas disturbed by construction of this project will be accomplished by a combination of seeding of selected native grass species and regeneration from salvaged and re-spread topsoil. The native grass seed will consist of sideoats grama, blue grama, green needlegrass, prairie junegrass and western wheatgrass.

Special Considerations:
It is imperative that the genetic integrity be preserved and protected, therefore, it is required that pre- and post-construction vegetation monitoring be completed. Areas disturbed by the proposed road construction will be revegetated with native seed indigenous to the Park. This will be accomplished by hand collection of seed of selected native grass species within park boundaries by park staff. The collected seed will be propagated and increased to a sufficient quantity by the NRCS Plant Materials Program and returned to the park for establishment after completion of construction.

Some exotic and other invasive plant species occur along the existing road corridor. Canada thistle is the most prevalent noxious weed inhabiting the proposed construction area, while some pockets of leafy spurge may also exist. Other invasive plant species that can be found growing in the road corridor include crested wheatgrass and smooth brome. An intense preconstruction weed control program, consisting of timely herbicide applications, will be initiated in the spring 2007 and continued throughout the construction period.

Due to the harsh weather and soil conditions existing at THRO, hydroseeding will be the preferred method of revegetating the native seed and will require supplemental watering to ensure seed germination and plant establishment. It is imperative that the grass cover is well established to provide erosion control that will stabilize the highly erosive soils.

Any sources of imported fill, gravel, and topsoil will need to be located, inspected and approved prior to import into the park.

In-park staging and stockpile sites will be inspected. If weed species are present, these will need to be treated or removed.

Construction, seeding equipment (hydroseeder tanks and hoses) and hauling trucks will be power washed prior to entrance into the park.

All areas of disturbance will be rehabilitated.

All construction will be limited to designated area required to complete work. All activity, including vehicle and material use and storage, will not be allowed outside predetermined marked construction staging areas.

APPENDIX C: WETLAND DELINEATION MAPS AND ASSOCIATED PHOTOGRAPHS, WETLAND DELINEATION COMPLETED IN JANUARY 2007, THEODORE ROOSEVELT NATIONAL PARK

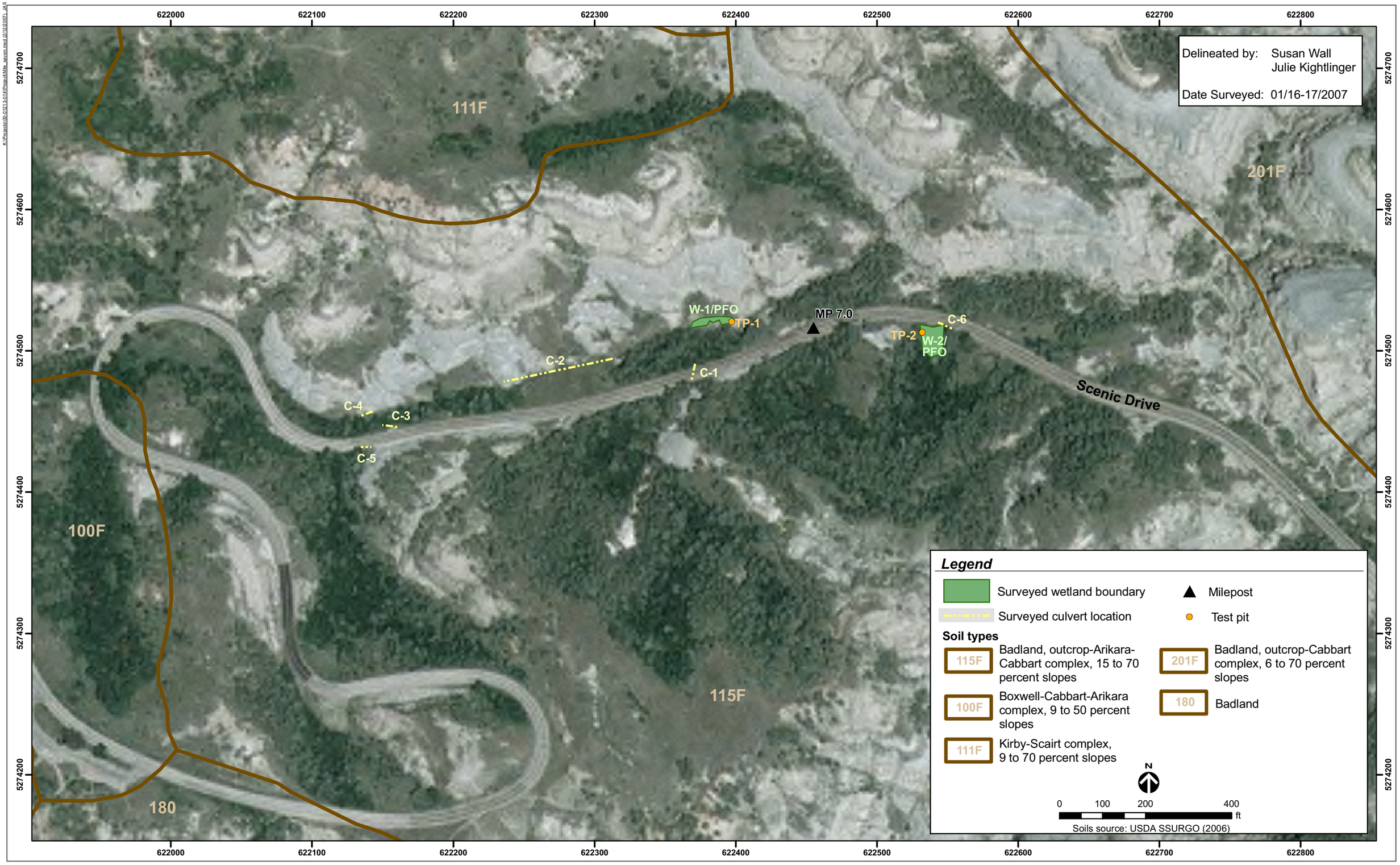

Figure 3. Surveyed wetlands, culverts, and soil types along Scenic Drive in Theodore Roosevelt National Park, McKenzie County, North Dakota.

K:\Projects\00-01213-0-14\Project\Squaw_creek.mxd (2/5/2007) JAS

Delineated by: Susan Wall
Julie Kightlinger

Date Surveyed: 01/16-17/2007

110B
115F
114
114
201F
109
106
408B
W
406
105

Little Missouri River
Squaw Creek
W-5/PEM
TP4
W-4/PSS
TP3
W-3/PSS

624500 624600 624700 624800 624900 625000 625100 625200 625300 625400

5273100 5273000 5272900 5272800 5272700 5272600

Legend

Surveyed wetland boundary

Test pit

Soil types

- 115F — Badland, outcrop-Arikara-Cabbart complex, 15 to 70 percent slopes
- 110B — Maltese-Gerda complex, 0 to 6 percent slopes
- 114 — Glendive and havre soils, channeled, 0 to 3 percent slopes
- 408B — Hanly fine sandy loam, wooded, 0 to 6 percent slopes
- 201F — Badland, outcrop-Cabbart complex, 6 to 70 percent slopes
- W — Water
- 109 — Havre silt loam, wooded, 0 to 1 percent slopes
- 106 — Glendive fine sandy loam, 0 to 3 percent slopes
- 406 — Glendive fine sandy loam, wooded, 0 to 3 pecent slopes
- 206 — Glendive fine sandy loam, 0 to 3 percent slopes, rarely flooded

N

0 100 200 400 ft

Soils source: USDA SSURGO (2006)

Figure 4. Surveyed wetlands, culverts, and soil types near Squaw Creek in Theodore Roosevelt National Park, McKenzie County, North Dakota.

THEODORE ROOSEVELT NATIONAL PARK, NORTH UNIT
WETLAND DELINEATION
PHOTOGRAPHIC LOG

Photo Number	Photo Description
1	Wetland W-1 facing west from within the wetland
2	Stone headwall at the outlet of Culvert C-1, facing south
3	Wetland W-2, facing south from the road
4	Wetland W-3, facing north from within the west end of the wetland showing standing water (ice)
5	Wetland W-4, facing east from within the Squaw Creek channel, showing the forested section
6	Wetland W-4, facing east from the east portion of the breached beaver dam
7	Beaver dam with Wetland W-5 in the background, facing northwest
8	Eroded area behind the breached beaver dam, facing northeast from the west side of the bridge


1


2


3


4


5


6


7


8

As the nations 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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