CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This chapter of the EA forms the scientific and analytic basis for comparisons of alternatives as required by 40 CFR 1502.14. This discussion of impacts (effects) is organized in parallel with Chapter 3 (The Affected Environment) and is organized by impact topic (or resource area), as follows:

- Physical resources: ecological and watershed settings, soil and water resources, and air quality (including noise)
- Biological resources: vegetation; wildlife and fisheries; and threatened, endangered, and sensitive species
- Heritage and cultural resources
- Social resources: wilderness, scenery resources, transportation and roads, and recreation.

The no action alternative and the proposed action are discussed within each resource area. To the extent possible, the direct, indirect, short-term, long-term, beneficial, and adverse impacts of each alternative are described for each resource area. Cumulative impacts are discussed in the context of the definition given in 40 CFR 1508.7.

Intensity, Duration, and Type of Impact — Evaluation of alternatives takes into account intensity, duration, and types of impacts on the resources in the project area and region. Intensity of impacts is generally defined as being negligible, minor, moderate, or major (with negligible meaning no change, minor being barely detectable, moderate being clearly detectable, and major being a substantial alteration of current conditions). Duration of impacts is evaluated based on the short-term or long-term nature of alternative-associated changes on existing conditions. Type of impact refers to the beneficial or adverse consequences of implementing a given alternative. Methodologies were identified to define the change in resources that would occur with implementation of the alternatives. Thresholds were established for each impact topic to help understand the severity and magnitude of changes in resource conditions, both adverse and beneficial, of the various management alternatives. More exact interpretations and definitions of intensity, duration, and type of impact are presented for each resource area examined in the following sections. However, since the full engineering design of the proposed tower and facility has not been completed, analysis is largely qualitative. Professional judgment is used to reach reasonable conclusions as to the intensity and duration of potential impacts.

Cumulative Impacts — The CEQ regulations, which implement NEPA, 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 reasonable foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7).

Cumulative impacts are considered for both the no action and proposed action alternatives. Cumulative impacts were determined by combining the impacts of action alternatives with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or foreseeable future projects within TRNP and DPG and, if necessary, the surrounding region. Other actions and plans that were considered during the analysis of cumulative impacts were presented in Section 1.3, Relationship to Other Environmental and Planning Documents.

Impairment Analyses –- NPS regulations and guidance require an analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, as established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values. However, the laws do give the NPS the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within a park system unit, that discretion is limited by the statutory requirement that the agency must leave park 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 resources or values.

An impact on any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- Key to the natural or cultural integrity of the park
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park; visitor activities; or activities undertaken by concessionaires, contractors, and others operating in the park.

The following process was used to determine whether the alternatives had the potential to impair park resources and values:

1. The park's enabling legislation, the General Management Plan, the Strategic Plan, and other relevant background were reviewed with regard to the unit's purpose and significance, resource values, and resource management goals or desired future conditions.
2. Management objectives specific to resource protection goals at the park were identified.
3. Thresholds were established for each resource of concern to determine the context, intensity, and duration of impacts, as defined above.
4. An analysis was conducted to determine if the magnitude of impact reached the level of "impairment," as defined by NPS Management Policies.

The impact analysis includes any findings of impairment to park resources and values for each of the management alternatives.

4.1 PHYSICAL RESOURCES

This section provides information regarding potential impacts on the ecological and watershed settings, soil resources, water resources, and air quality of the TRNP and DPG area.

4.1.1 Ecological Setting

Methodology — Impact analysis focuses on the effects of the no action alternative and proposed action on the ecological setting (macro-environment), including topography, underlying bedrock, soil types, regional hydrology, and regional climate. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — No change on regional topography, underlying bedrock, soil types, regional hydrology, and regional climate. The action would not affect the existing natural environment because any change would be too small or localized to exert a measurable or perceptible effect on the natural system function.

- Minor — Very limited change on regional topography, underlying bedrock, soil types, regional hydrology, and regional climate. The action would affect the existing natural environment, but its measurement would require considerable scientific effort, it would be very localized in area, and its effect on the natural system function would be barely perceptible.

- Moderate — Disturbance on regional topography, underlying bedrock, soil types, regional hydrology, and regional climate. The action would cause measurable effects on a large area of the natural environment, and natural system functions could deviate from normal levels under existing conditions.

- Major — Severe disturbance on regional topography, underlying bedrock, soil types, regional hydrology, and regional climate. The action would have drastic consequences on the existing natural environment. The change would be readily apparent in the region. Natural system functions would be permanently altered from normal levels under existing conditions.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

No Action Alternative

Analysis — The no action alternative would leave the project area unchanged in terms of topography, underlying bedrock, soil types, regional hydrology, and regional climate.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact the ecological setting.

Conclusion — The no action alternative would have negligible long-term impacts on the ecological setting of the project and CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the ecological setting of the project or CE areas.

Proposed Action

Analysis — The proposed action would leave the project area unchanged in terms of topography, underlying bedrock, soil types, regional hydrology, and regional climate.

***Cumulative Impacts* —** No present, ongoing, or reasonably foreseeable future actions are planned for the project or CE areas that would impact the ecological setting.

***Conclusion* —** The proposed action would have negligible long-term impacts on the ecological setting of the project and CE areas through natural ecological processes.

***Impairment* —** The proposed action would not impair the ecological setting of the project or CE areas.

4.1.2 Watershed Setting

Methodology — Impact analysis focuses on the effects of the no action alternative and proposed action on the watershed setting, including the designation of watersheds and sub-watersheds (as defined by regional topography) and potential changes in land use. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — No change to designation of watersheds and sub-watersheds, or to land use.
- Minor — Very limited change to designation of watersheds and sub-watersheds, or to land use.
- Moderate — Disturbance on a watershed scale, changes to designation of watersheds and sub-watersheds, or changes to land use.
- Major — Severe disturbance on a watershed scale, severe changes to designation of watersheds and sub-watershed, or severe changes to land use.
- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

No Action Alternative

***Analysis* —** The no action alternative would leave the project area unchanged in terms of designation of watersheds or sub-watersheds, and land use. No disturbance on a watershed scale would result from the no action alternative.

***Cumulative Impacts* —** No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact the watershed setting.

***Conclusion* —** The no action alternative would have negligible long-term impacts on the watershed setting of the project and CE areas through natural ecological processes.

***Impairment* —** The no action alternative would not impair the watershed setting of the project or CE areas.

Proposed Action

***Analysis* —** The proposed action would leave the project area unchanged in terms of designation of watersheds or sub-watersheds, and land use. No disturbance on a watershed scale would result from the proposed action.

***Cumulative Impacts* —** No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact the watershed setting.

***Conclusion* —** The proposed action would have negligible long-term impacts on the watershed setting of the project and CE areas through natural ecological processes.

***Impairment* —** The proposed action would not impair the watershed setting of the project or CE areas.

4.1.3 Soil Resources

Methodology — Impact analysis focuses on the effects of the no action alternative and proposed action on soil resources, including the effects and interaction of existing soil conditions in the project and CE areas, groundwater depth, drainage, erosion potential, and slope. Impacts of construction activities as well as subsequent operations of the proposed facilities are discussed based on the soil types present in the project area. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — No change in drainage capacity or moisture absorbency of existing soils, or in erosion potential during or after construction; no potential changes to groundwater quality or flow. Soils would not be affected, or the effects on soils would be below or at the lower levels of detection. Any effects on soil productivity or fertility would be slight, and no long-term effects on soils would occur.

- Minor — Very limited soil disturbance (involving an area less than 5 acres) having some possible short-term and localized effects related to increased erosion potential, but no long-term changes in soil drainage capacity, moisture absorbency, or groundwater resources. The effects on soils would be detectable. Effects on soil productivity or fertility would be small. If mitigation is needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

- Moderate — Disturbance of 5 acres or more of soil requiring an erosion control plan with mitigation to address measurable, long-term changes in soil drainage and moisture absorbency characteristics, and possible small-scale indirect impacts on groundwater resources. The effect on soil productivity or fertility would be readily apparent, likely long-term, and result in a change to the soil character over a relatively wide area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

- Major — Disturbance of 5 acres or more of soil requiring an erosion control plan with mitigation to address measurable, long-term changes in soil drainage and moisture absorbency characteristics, and direct and indirect impacts on local groundwater flow and/or quality. The effect on soil productivity or fertility would be readily apparent and long-term; the character of the soils over a large area would change substantially. Mitigation measures to offset adverse effects would be needed; they would be extensive with success not guaranteed.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

The FS Internet-based interface to the Water Erosion Prediction Project (FSWEPP) model was used to predict erosion from the roadbed. "Road WEPP" was used to predict soil erosion for the construction phase and the future road condition (Elliot, Hall, and Scheele 2000). "Disturbed WEPP" was used to estimate the amount of soil erosion from the tower site (Elliot, Hall, and Scheele 2000). The FSWEPP

model provided an approximation of erosion and sedimentation. "At best, any predicted runoff or erosion value, by any model, would be within only plus or minus 50 percent of the true value. Erosion rates are highly variable, and most models can predict only a single value" (Elliot, Hall, and Scheele 2000). Replicated research has shown that observed values vary widely for identical plots, or the same plot from year to year (Elliot, Page-Dumroese, and Robichaud 1996).

No Action Alternative

Analysis — Direct and indirect effects of the no action alternative would be soil disturbance and erosion. Dakota Prairie Grassland Land and Resource Management Plan standards and guidelines (S&G) for soil resources must be followed regardless of which alternative is selected for implementation. The S&Gs for soil resources are summarized in Table 4-1.

The predicted erosion rate for the tower site in its current condition is 1.3 tons/acre/yr. Soil would be expected to erode at the same rate in the future. No change in drainage capacity or moisture absorbency of existing soils, or changes to groundwater quality or flow, would be expected from implementation of the no action alternative.

TABLE 4-1
STANDARDS AND GUIDELINES FOR SOIL RESOURCES

Guidelines	Keep ground disturbances to a minimum when constructing roads and other facilities. Ensure road length and road width fit the purpose of construction and are compatible with local topography.
	Prohibit soil disturbing activities (e.g., road construction, well pad construction) on slopes greater than 40 percent and on soils susceptible to mass failure, unless the alternative causes more environmental damage.
Standards	Stabilize and maintain roads and other facilities' sites during and after construction to minimize erosion.
	Reclaim roads and other disturbed sites when use ends to prevent resource damage. Restoring stable grades, stable drainage, and ground cover are critical to closing out disturbances and protecting soil productivity and stream health.
	Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate.
	Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands.

Source: FS. 2001a. *Dakota Prairie Grasslands Land and Resource Management Plan*. Dakota Prairie Grasslands. May.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact soil resources.

Conclusion — The no action alternative would have negligible, site-specific, long-term impacts on the soil resources of the project and CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the soil resources of the project or CE areas.

Proposed Action

Analysis — Direct and indirect effects of the proposed action would be soil disturbance and erosion. Dakota Prairie Grassland Land and Resource Management Plan S&Gs for soil resources must be followed regardless of which alternative is selected for implementation. The S&Gs for soil resources are summarized in Table 4-1.

The area of disturbance for the roadbed is estimated to occupy approximately 3 acres, which is the same as the existing condition. FSWEPP predicts erosion rates of 1.3 tons/acre/yr for short grass prairie lands at 5-percent slope and 40-percent soil cover. Typical erosion rates for a Western watershed rangeland are between 0.1 and 1.8 tons/acre/yr (Dissmeyer 2000). A typical erosion rate for sparse grassland in Alberta is approximately 7.7 tons/acre/yr (Dunne and Leopold 1978). Thus, FSWEPP predicts erosion quantities within the range reported in the literature.

Predicted erosion rates during construction and future road use are presented in Table 4-2. Cut and fill slopes were not included in these predictions. These areas would erode because their cut and fill slopes along the road would erode at approximately background erosion rates following re-vegetation.

TABLE 4-2
ESTIMATED EROSION AND SEDIMENTATION FROM THE ROAD RECONSTRUCTION

Phase or Condition	Predicted Erosion (tons/year)	Percent Retained within 100 feet	Percent Retained within 420 feet	Percent Retained within 840 feet
Construction Phase	29.8	65	95	99
Future Condition	8.5	54	89	97

Source: Tetra Tech. 2005a. Results of FSWEPP analysis for conditions of Replacement of a communications tower on the TRNP and Reconstruction of an access road on the DPG. Unpublished data summary. FS Administrative Record.

The predicted erosion rate for the tower site in its current condition is 1.3 tons/acre/yr. The tower location is not changing and would be expected to erode at the same rate in the future. During construction, erosion modeling indicates a potential increase of erosion to 12.8 tons/acre/yr. The predicted erosion for the future condition of the road is 3.6 tons/acre/yr. Direct effects of the proposed action and no action alternative are approximately the same and would be site-specific, long-term, and minor. The area of soil disturbance would not be substantially changed. Road reconstruction and installation of the tower would occur approximately within the footprint of the existing facilities. Indirect effects on erosion would be an expected decrease in roadbed erosion from implementing the proposed action. Gullies along the existing road would be restored and stabilized.

Erosion could be mitigated through use of Best Management Practices (BMP) that are mandatory on all construction projects disturbing more than 1 acre (NDDoH 2001). *A Guide to Temporary Erosion-Control Measures for Contractors, Designers and Inspectors* provides BMPs to reduce erosion (ND DoH 2001). Temporary Erosion-Control Measures (TECM) would reduce erosion below predicted quantities during construction phase and re-vegetation of cut and fills along the road. Erosion also could be mitigated by following the S&Gs presented in Table 4-1.

No change in drainage capacity or moisture absorbency of existing soils, or changes to groundwater quality or flow, would be expected from implementation of the proposed action.

***Cumulative Impacts* —** No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact soil resources.

***Conclusion* —** The proposed action would have minor, site-specific, and short- and long-term impacts on the soil resources of the project and CE areas.

***Impairment* —** The proposed action would not impair the soil resources of the project or CE areas.

4.1.4 Water Resources

Methodology — The potential impacts of the alternatives on water resources were evaluated by comparing their locations to the location of the project area. Available information on water resources of the region was reviewed to determine proximity of water resources to the project area. The nearest mapped stream is approximately 840 feet northwest of NFSR #730A-2; no mapped streams cross the existing project area; no mapped wetlands are located within the project area; and the nearest mapped wetland in the CE area is more than 840 feet away. Therefore, analyses on water resources focus on potential runoff and soil erosion that could occur after storm events, causing increased sedimentation into streams. Analyses also focus on any potential encroachment into streams and riparian areas. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — Neither water quality nor hydrology would be measurably changed from current conditions. Chemical, physical, or biological changes to water quality would not be detectable and would be well below water quality standards or criteria, and would be within historical or desired water quality conditions. No measurable change would be evident in potential levels of runoff or erosion, or sedimentation into streams; no encroachment into streams and riparian areas would occur. No measurable change to riparian vegetation, habitat, or function would be detectable.

- Minor — Chemical, physical, or biological changes in water quality or hydrology would be measurable, would be below water quality standards or criteria, and would be within historical or desired water quality conditions. Changes would likely be small, localized, and short-term.

- Moderate — Chemical, physical, or biological changes in water quality or hydrology would be measurable and would be at or below water quality standards or criteria. However, historical baseline or desired water quality conditions would be altered on a short-term basis. Mitigation measures would be necessary and would be effective.

- Major — Chemical, physical, or biological changes in water quality or hydrology would be measurable, and water quality standards or criteria would be slightly and singularly exceeded on a short-term basis. Also, historical baseline or desired water quality conditions would be altered on a long-term basis. Mitigation measures would be necessary, with success not guaranteed.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

Eroded soil may be retained within filter strips that separate the soil disturbance area from surface water features. A filter strip distance of 100 feet was used to predict the amount of eroded soil that would be

retained in close proximity to the road. The filter strips were extended to 840 feet (the distance from the nearest mapped stream to NFSR #730A-2) and 420 feet (half the distance to the nearest mapped stream as an estimate of the proximity of unmapped streams to the road)—values used to obtain an approximation of the percentage of eroded soil that may become sediment in streams possibly occurring within the CE area.

No Action Alternative

***Analysis* —** Direct and indirect effects of the no action alternative would be continued sedimentation into streams because of erosion and any potential encroachment into streams and riparian areas. Erosion would be expected to continue at current rates, and no direct encroachment would occur into stream corridors and riparian areas due to the no action alternative. The no action alternative would not affect water quality or hydrology; not cause exceedance of water quality standards and criteria; and not change any riparian vegetation, habitat, or function. Dakota Prairie Grassland Land and Resource Management Plan S&Gs for water resources must be followed regardless of which alternative is selected for implementation. The S&Gs for water resources are summarized in Table 4-3.

TABLE 4-3
STANDARDS AND GUIDELINES FOR WATER RESOURCES

Standards	Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands (pertains to soils).
	Allow only those actions next to perennial and intermittent streams, seeps, springs, lakes, and wetlands that maintain or improve long-term proper functioning of riparian ecosystem conditions.
	Design activities to protect and manage the riparian ecosystem. Maintain the integrity of the ecosystem, including quantity and quality of surface water and groundwater.
	Maintain and protect hydrologic regime that supplies groundwater to the wetlands so as to support species and habitats depending on the existing water table and its natural variations.
Guidelines	Do not deposit waste material (silt, sand, gravel, soil, slash, debris, chemicals, or other material) below high water lines, in riparian areas, in areas immediately adjacent to riparian areas, or in natural drainageways (draws, land surface depressions, or other areas where overland flow concentrates and flows directly into streams or lakes). In addition: · Do not deposit foreign material or agricultural waste in natural drainageways. · Locate the lower edge of disturbed or deposited soil banks outside the active floodplain. · Prohibit stockpiling of topsoil or any other disturbed soil in the active floodplain. · Locate drilling mud pits outside of riparian areas, wetlands, and floodplains. If location is unavoidable in these areas: · Seal and dike all pits to prevent leakage. · Do not allow new roads to parallel streams when road location must occur in riparian areas except where absolutely necessary. Locate all crossings at points of low bank slope and firm surfaces.

Source: FS. 2001a. *Dakota Prairie Grasslands Land and Resource Management Plan*. Dakota Prairie Grasslands. May.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact water resources.

Conclusion — The no action alternative would have negligible long-term impacts on the water resources of the project and CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the water resources of the project or CE areas.

Proposed Action

Analysis — Direct and indirect effects of the proposed action would be sedimentation into streams because of erosion and any potential encroachment into streams and riparian areas. No direct encroachment would occur into stream corridors and riparian areas due to the proposed action. The no action alternative would not affect water quality or hydrology; not cause exceedance of water quality standards and criteria; and not change any riparian vegetation, habitat, or function. However, the proposed action would increase erosion and sedimentation into streams.

Fifty-four to 65 percent of potential soil erosion is predicted to be retained within 100 feet of the road travel surface during construction and future operations (Tetra Tech 2005a). Less than 1 percent of predicted eroded soil would likely reach mapped ephemeral streams during the construction phase and less than 5 percent would reach the assumed potential location of unmapped ephemeral steams (Table 4-2) (Tetra Tech 2005a). After construction activities, the predicted percentage of eroded soil that may reach streams is 3 percent and 11 percent for mapped and unmapped ephemeral streams, respectively.

Extrapolated predictions of unmitigated erosion quantities of sediment delivery, using the FSWEPP model, indicate an unmitigated sediment delivery to mapped streams of 0.4 and 0.3 tons per year during construction and operation of the road, respectively. Assumption is that reconstruction of the road would solve current gully erosion along the existing road and reduce erosion from the road in the future.

Extrapolated filter strip retention for the road to the tower location is less than 0.1 ton of eroded soil predicted to reach mapped ephemeral streams during construction and future management. Less than 0.2 ton per year would reach the location of mapped streams. These are predictions without mitigations and are nonetheless site-specific, long-term, and minor. Sediment delivery to streams can be reduced by following the S&Gs presented in Table 4-3, and by implementing routine road construction BMPs and implementing NDDoH TECM, as identified in the soils section.

Dakota Prairie Grassland Land and Resource Management Plan S&Gs for water resources must be followed regardless of which alternative is selected for implementation. The S&Gs for water resources are summarized in Table 4-3 (FS 2001a).

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact water resources.

Conclusion — The proposed action would have minor, short- and long-term impacts on the water resources of the project and CE areas due to an increase in erosion and sedimentation.

Impairment — The proposed action would not impair the water resources of the project or CE areas.

4.1.5 Air Quality and Noise

Methodology — Impact analysis focuses on the effects of the no action alternative and proposed action on the air quality and noise, including assessment for attainment with the NAAQS, air quality designations of the region, visibility impairment based on personal observations and photographs, and ambient noise levels based on personal observations. Historical and current data from air monitoring stations in the region were examined. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — No changes would occur, or changes in air quality would be below or at the level of detection, and, if detected, would have effects considered slight and short-term. No measurable change in levels of criteria pollutants under the NAAQS would occur. Noise level change would be at or below the lowest level of human perception (3 decibels or less), with no measurable consequences, either adverse or beneficial. Natural sounds would be dominant.

- Minor — Changes in air quality would be measurable, although the changes would be small and short-term with localized effects. No air quality mitigation measures would be necessary. Measurable change in levels of criteria pollutants under the NAAQS could occur, but no attainment changes would be necessary for any pollutants. Noise level change would be barely to slightly perceptible (3 to 5 decibels) but with little consequence to visitors' experience. Natural sounds would be dominant, but other noise could occasionally occur at infrequent or low levels.

- Moderate — Changes in air quality would be measurable and would have consequences, although the effects would be relatively local. Air quality mitigation measures would be necessary and the measures would likely be successful. Measurable change in levels of criteria pollutants under the NAAQS would be evident, and one attainment status change would be necessary for one criteria pollutant. Noise level change would be perceptible (5 to 10 decibels) with noticeable consequences to visitors' experience. Natural sounds would be dominant, but other noise could occasionally occur at low or moderate levels.

- Major — Changes in air quality would be measurable, would have substantial consequences, and would be noticed regionally. Air quality mitigation measures would be necessary with success not guaranteed. Measurable change in levels of criteria pollutants under the NAAQS would be evident, and more than one attainment status change would be necessary for more than one criteria pollutant. Noise level change would be readily perceptible (10 decibels or more) with substantive consequences to visitors' experience. Natural sounds would be obscured by other noise frequently or for extended periods of time.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period, or recovery within seven days or less.
    - Long-Term — Takes longer than seven days to recover, or essentially a permanent post-construction impact.

No Action Alternative

Analysis — The no action alternative would leave the project area unchanged in terms of attainment with the NAAQS, air quality designations of the region, visibility impairment, and ambient noise levels. Noise levels would not change and natural sounds would be dominant.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact air quality or noise.

Conclusion — The no action alternative would have negligible long-term impacts on the air quality and soundscape of the project and CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the air quality or soundscape of the project or CE areas.

Proposed Action

Analysis — The proposed construction would cause direct site-specific, short-term, minor impacts on air quality in the areas immediately adjacent to the proposed site. During construction, exhaust and dust dispersed by construction vehicles would impact the air quality temporarily in the immediate areas of the proposed site. Those impacts would affect the site only during construction. Air quality would not be permanently degraded, and the temporary impacts would not affect the status of the region as an attainment area under the NAAQS because the impacts would affect only the immediate vicinity of each site. Visibility would not be impacted. Therefore, the impacts on air quality would not be significant.

Noise related to the proposed construction would cause direct site-specific, short-term, moderate impacts on the areas in the immediate vicinity of the proposed site. Use of construction machinery and increase in vehicle traffic at the site would cause an increase in noise to a level above the current ambient level of noise at the site. The impacts would affect the site only during construction. Heavy machinery could produce noise between 70 and 98 decibels at a distance of approximately 50 feet. However, the impacts related to noise would not be significant due to the localized and temporary status of the noise, and the fact that the nearest residences are located approximately 1 mile from the proposed site. Also, all equipment used on the site would meet applicable fire and safety codes, which include use of properly maintained mufflers.

Cumulative Impacts — Operation of the proposed wireless facility would not include any discharges of any substance into the air of the region. Maintenance of the proposed wireless telecommunication facility would have no cumulative impacts on air quality because maintenance visits would be relatively infrequent (once per month by a single vehicle). Because maintenance visits would be relatively infrequent, operation of the proposed wireless telecommunication facilities would have negligible impacts on noise levels at the proposed site. The proposed action would conform to the applicable state and federal implementation plans for attainment of air quality goals for the region.

Conclusion — The proposed action would have minor short-term and negligible long-term impacts on the air quality and soundscape of the project and CE areas.

Impairment — The proposed action would not impair the air quality or soundscape of the project or CE areas.

4.2 BIOLOGICAL RESOURCES

This section provides information on the potential impacts on the vegetation; wildlife and fisheries; and threatened, endangered, and sensitive species of the TRNP and DPG area.

4.2.1 Vegetation

Methodology — Impact analyses focus on the amount of disturbance to existing terrestrial vegetation communities in the project area. Important factors include the quality of natural vegetation, the amount of site clearing necessary for implementation of the proposed action, the role of the project area in terms of unique habitat, and importance in connectivity of the ecological landscape. Potential for site restoration also is a factor in evaluation of impacts on vegetation. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — Impacts would result in no measurable or perceptible changes in plant community size, integrity, or continuity. No native terrestrial plant communities would be disturbed, and no direct or indirect impacts on native vegetation would occur.

- Minor — Impacts would be measurable or perceptible but localized within a relatively small area. The plant community's overall viability would not be affected and, if left alone, would recover.

- Moderate — Impacts would cause a change in the plant community (for example, abundance, distribution, quantity, or quality); however, the impact would remain localized.

- Major — Impacts on the plant community would be substantial, highly noticeable, and permanent.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Complete disturbance recovery in less than three years.
    - Long-Term — Disturbance recovery requiring more than three years to return to pre-disturbance levels.

No Action Alternative

Analysis — The no action alternative would leave the project area unchanged in terms of the quality of natural vegetation; unique habitat; connectivity of the ecological landscape; and plant community size, integrity, and continuity.

Cumulative Impacts — No reasonably foreseeable future projects are planned for the project area or CE area that would impact vegetation. However, many present and ongoing activities (multiple uses) in the TRNP and on FS lands would potentially impact the project and CE area, including grazing by livestock; various recreation activities (as described in other sections of this EA); and oil, gas, and other commercial development. Additionally, natural expansion of noxious and invasive weeds would possibly impact the project and CE areas.

Conclusion — The no action alternative would have negligible long-term impacts on the vegetation of the project and CE areas through natural ecological processes and ongoing activities.

Impairment — The no action alternative would not impair the vegetation of the project or CE areas.

Proposed Action

Analysis — The proposed construction would cause direct site-specific, long-term, minor impacts on the vegetation of the proposed site because some vegetation would be removed from both the proposed location of the tower and the proposed improvements to the existing access road. These impacts would be minor because of the small size of the site and the localized activities. These impacts would be adverse

because some of the vegetation would be permanently removed and some would be temporarily removed, increasing the potential for short- and long-term increases in soil erosion. These impacts would not be significant to the vegetation communities as a whole because of the small size of the site and mitigation of any impacts resulting from soil erosion through use of soil erosion barriers and BMPs, and re-vegetation efforts. Native seed mixes would be required for all re-vegetation efforts, and the site-specific seed mixture would be specified by the FS in the Private Road Special Use Permit. The amount of vegetation removed would be minimized to reduce the potential of associated soil erosion and to maintain as much natural vegetation on the site as possible. Lastly, mitigation measures to reduce the spread of noxious weeds would be implemented, including pressure spraying vehicles with water before entering and leaving the project area. Also, the area of road reconstruction would need to be spot sprayed, as needed, before reconstruction activity begins. The FS sent letters of concurrence with this assessment (FS 2005d and FS 2005e).

Cumulative Impacts — Operation of the proposed facilities would cause direct site-specific, long-term, minor impacts on the vegetation of the proposed site because managing the vegetation would be necessary to minimize possible damage to the facilities. Management activities would include periodic removal and destruction of vegetation, as well as spraying of herbicides, as approved by the FS, for road maintenance.

Conclusion — The proposed action would have minor, site-specific, short- and long-term impacts on the vegetation of the project and CE areas from localized vegetation removal.

Impairment — The proposed action would not impair the vegetation of the project or CE areas.

4.2.2 Wildlife and Fisheries

Methodology — Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise, they are protected from harvest, harassment, or harm by human activities. Management goals for wildlife include maintaining components and processes of naturally evolving ecosystems, including natural abundance, diversity, and the ecological integrity of wildlife and fisheries. For the impact analyses, overall footprint, configuration, and edge-effect of the proposed activities were examined in the context of the project and CE areas. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — No observable or measurable impacts on native species, their habitats, or the natural processes sustaining them would occur. Impacts would be of short duration and would be well within natural fluctuations.

- Minor — Wildlife and fisheries would be affected by localized disturbance and/or unnaturally elevated predation levels. Few species would be affected, with potential for localized reduction in reproductive success and/or decline in size of small subcolonies. Impacts would be detectable but not outside the natural range of variability. Impacts would not result in any long-term effects on native species, their habitats, or the natural processes sustaining them.

- Moderate — Wildlife and fisheries would be affected by disturbance and/or unnaturally elevated predation levels over a broader area. More species would be potentially affected, with potential for long-term abandonment of small subcolonies and moderate reduction in population size (less than 25 percent). Impacts would be detectable and outside the natural range of variability in some cases. Impacts would result in some long-term effects on native species, their habitats, or the natural processes sustaining them.

- Major — Many wildlife and fisheries species would be affected by continuous, prolonged disturbance and/or unnaturally elevated predation levels. There would be potential for long-term subcolony with significant reduction in population size (more than 25 percent). Impacts would be detectable and outside the natural range of variability. Impacts would result in long-term effects on native species, their habitats, or the natural processes sustaining them.

- Duration — Duration can be defined as either short-term or long-term, as follows:
  - Short-Term — Lasting only during the construction period or no longer than one year.
  - Long-Term — Essentially a permanent or post-construction impact.

No Action Alternative

Analysis — The no action alternative would leave the project area unchanged in terms of the natural abundance, diversity, and ecological integrity of wildlife and fisheries in the project and CE areas.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact wildlife or fisheries.

Conclusion — The no action alternative would have negligible long-term impacts on the wildlife and fisheries of the project and CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the wildlife or fisheries of the project or CE areas.

Proposed Action

Analysis — The proposed action would result in permanent removal of some wildlife habitat immediately around the proposed road reconstruction. However, because of the small size of the lost habitat and the abundance of other wildlife habitat in the area, this impact would be minor. Further, the noise generated by construction and maintenance activities would temporarily displace wildlife in the area. This displacement would be temporary because, when the construction activities cease, wildlife would return to the vicinity of the site.

Despite these minor impacts, no change would occur to the overall natural abundance, diversity, and ecological integrity of wildlife and fisheries in the project and CE areas. The proposed project also would not increase fragmentation because:

- The overall footprint of the project area would be the same as the existing footprint.
- No increase in edge-effect would result within the project area.
- The resulting topography and vegetation would allow animal movement through the project area.
- An existing road would receive minimal improvements and would be used infrequently.
- The replacement tower would be the same height as the existing tower.
- The proposed equipment structure would be constructed in an existing fenced footprint.

Implementing the proposed action would improve access to the site and surrounding area, which might increase the likelihood of wildlife poaching in the area. No evidence of previous wildlife poaching in the project area has been noted. If the proposed action is implemented, the NPS would increase patrol of the road to minimize any potential poaching in the project area.

Finally, although negligible loss of migratory bird habitat would result, these species pose a special wildlife concern related to projects such as the proposed action, in accordance with the provisions of the Migratory Bird Treaty Act.

Because of the properties and height of the structure, migratory birds in the area could collide with the tower. Absence of wetlands or bodies of water, and scarcity of forested habitats on the site would reduce the possibility of collisions, because bodies of water and forested habitats usually attract migratory birds; with fewer migratory birds on the site, the potential number of collisions would be small. The impacts on migratory birds would be the same as those now exerted by the existing tower. Long-term use of the wireless telecommunication tower would have negligible impacts on migratory birds.

Verizon Wireless personnel would inspect the tower location regularly, in coordination with NPS and USFWS. If bird strikes were discovered, Verizon Wireless personnel would consult with the appropriate federal and state agencies.

The FS sent letters of concurrence with this assessment (FS 2005d and FS 2005e).

***Cumulative Impacts* —** No reasonably foreseeable future projects are planned for the project area or CE area that would impact wildlife. However, many present and ongoing activities (multiple uses) in the TRNP and on FS lands would potentially impact the project and CE area, including grazing by livestock; various recreation activities (as described in other sections of this EA); and oil, gas, and other commercial development.

***Conclusion* —** The proposed action would have minor, site-specific and local, short- and long-term impacts on the wildlife of the project and CE areas through habitat loss and temporary displacement during construction.

***Impairment* —** The no action alternative would not impair the wildlife or fisheries of the project or CE areas.

4.2.3 Threatened, Endangered, and Sensitive Species

Methodology — A list of threatened and endangered species that could occur in the Little Missouri National Grassland was obtained from the USFWS, and a list of sensitive species and raptor species of concern was obtained from the FS (October 28, 2004). The USFWS and the North Dakota Game and Fish Department (NDGF) were consulted for known and potential occurrences of species of concern in the project areas. Current information from raptor nests was obtained from the field survey (conducted May 20-21, 2005) and historical information (Earthworks 2005). A biological assessment/evaluation was completed, which contains the list and description of threatened, endangered, and sensitive species (see the Project File; Earthworks 2005).

The Endangered Species Act defines the thresholds of change for intensity of impacts and the duration of impacts, as follows:

- No effect — An action would not affect a listed species or designated critical habitat.
- May affect / not likely to adversely affect — May impact individuals or habitat, but effects on special status species are discountable (for example, extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated), or are completely beneficial. Any effects would not likely contribute to a trend towards Federal listing or loss of viability to the population or the species.

- May affect / likely to adversely affect — An adverse effect to a listed species may occur as a direct or indirect result of proposed actions, and the effect either is not discountable or is completely beneficial.

- Is likely to jeopardize proposed species / adversely modify proposed critical habitat (impairment) — The NPS or USFWS identifies situations in which the proposal could jeopardize the continued existence of a proposed species or adversely modify critical habitat to a species.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

Assessments for threatened and endangered species and proposed threatened and endangered species are conducted by evaluating past and present occurrences of the species, and by determining if potential habitat exists within the project area. Based on these two criteria, a determination is made about the project's direct and cumulative effects on each species. Measures to avoid or mitigate potential future effects are provided unless a "no effect" determination occurs.

No Action Alternative

Analysis **—** The no action alternative would leave the project area unchanged in terms of the potential presence of threatened, endangered, or sensitive species or habitat supporting such species. No effect on a listed species or designated critical habitat would occur.

Cumulative Impacts **—** No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact threatened, endangered, or sensitive species, or critical habitat.

Conclusion **—** The no action alternative would have negligible long-term impacts on the threatened, endangered, or sensitive species that may migrate into the project and CE areas through natural ecological processes.

Impairment **—** The no action alternative would not impair the threatened, endangered, or sensitive species, or critical habitat, that may occur in the project or CE areas.

Proposed Action

Analysis **—** The analysis of effects of the proposed action is presented by species, below. The project area contains possible habitat for raptor species of concern; therefore, the overall timing stipulation for activities occurring between February 1 and August 15 for active raptor nests would apply to the proposed activities. If the proposed action is implemented, completion of activities would be required prior to February 1, at which time raptors could return to the Little Missouri National Grassland. If construction of the project is delayed or continues into the spring or summer of future breeding seasons, an aerial raptor survey is recommended to search for new nests and ensure that no raptors of concern would be disturbed by the proposed activities. The FS sent letters of concurrence with this assessment (FS 2005d and FS 2005e).

Threatened and Endangered Species

Whooping Crane
Potential roost habitat does not exist in the project area. Therefore, the proposed action would have no effect on the whooping crane.

Black-footed Ferret
Black-footed ferrets were historically found in North Dakota, mostly in the southwest portion of the State. They rely almost exclusively on prairie dogs for food and den sites. The Black-footed Ferret Recovery Plan lists the need to reintroduce ferrets into suitable habitat — large prairie dog towns or complexes of towns in close proximity to each other. The proposed area of reintroduction is not near the project area, nor does the project area offer suitable habitat for this species. Therefore, the proposed action would have no effect on the black-footed ferret.

Bald Eagle
No known bald eagle nest sites, no habitat for breeding pairs, and no communal winter roost sites are within the proposed project area or immediately adjacent to the project site. However, individual specimens could migrate into the project and CE areas during the fall and winter. The proposed action may affect individual specimens during the fall or winter, if construction activities occurred during those seasons, but would not likely contribute to loss of population or species viability. Impacts would include displacement from the immediate project area; therefore, the impacts would be minor and short-term.

Sensitive Species

Baird's Sparrow
The project area provides small inclusions of suitable gently rolling, upland, mixed-grass prairie. The proposed action may affect individuals or habitat inclusions but would not likely contribute to a trend towards federal listing or loss of population or species viability (Earthworks 2005).

Burrowing Owl
Burrowing owls are closely associated with black-tailed prairie dog habitat. No prairie dog towns occur in the project area. Historical sightings of burrowing owls have not occurred within the project area. Therefore, the proposed action would have no effect on the burrowing owl.

Sprague's Pipit
The project area provides inclusions of suitable gently rolling, upland mixed-grass prairie. The proposed action may affect individuals or habitat inclusions but would not likely contribute to a trend towards federal listing or loss of population or species viability.

Greater Sage Grouse
Sage grouse are closely associated with big sagebrush (*Artemisia tridentata*) habitat. No extensive big sagebrush sites are in the project area. Also, there are no sage grouse leks in the project area. Therefore, the proposed action would have no effect on the greater sage grouse.

Loggerhead Shrike
Habitat of open native prairie with scattered thickets does occur in the area. The proposed action may affect individuals or habitat inclusions but would not likely contribute to a trend towards federal listing or loss of population or species viability.

Long-billed Curlew
Large areas of gently rolling prairie well suited for the long-billed curlew do not occur in the area. The general area has a rough topography. Therefore, the proposed action would have no effect on the long-billed curlew.

Peregrine Falcon
Based on the historical records and aerial survey, no active or inactive peregrine falcon nests occur within or near the project area. Peregrine falcons historically nested in North Dakota in badlands habitat. The last known breeding pair in western North Dakota was recorded in 1954 near Bullion Butte in Billings County (Earthworks 2005). Current habitat use in the badlands is by migratory individuals only. Therefore, the proposed action would have no effect on the peregrine falcon.

Black-tailed Prairie Dog
No black-tailed prairie dog towns are within the project area. Therefore, the proposed action would have no effect on the black-tailed prairie dog.

California Bighorn Sheep
The proposed site is located approximately 2 miles north of the Chateau DeMores California bighorn sheep herd. Although sheep could migrate into the project area, this would be unlikely due to the distance between the herd and the project area. Therefore, the proposed action would have no effect on the California bighorn sheep.

Dakota Skipper
The proposed project area provides potential habitat inclusions of undisturbed mixed grass-prairie (tall grass and mid-grass prairie) suitable for Dakota Skipper Butterfly. The proposed action may affect individuals or habitat inclusions but would not likely contribute to a trend towards federal listing or loss of population or species viability (Earthworks 2005).

Tawny Crescent Butterfly
The proposed project area provides potential habitat inclusions of green ash (*Fraxinus pennsylvanica*) draws suitable for the tawny crescent butterfly. The proposed action may affect individuals or habitat inclusions but would not likely contribute to a trend towards federal listing or loss of population or species viability (Earthworks 2005).

Ottoe Skipper
The proposed project area provides potential habitat inclusions of undisturbed mixed grass-prairie (ungrazed prairie where purple coneflower [*Echinacea spp.*] bloom) suitable for the Ottoe Skipper Butterfly. The proposed action may affect individuals or habitat inclusions but would not likely contribute to a trend towards federal listing or loss of population or species viability (Earthworks 2005).

Regal Fritillary Butterfly
The project area does not provide the violet (*Viola* spp.) habitat component and other necessary habitat components to support regal fritillary butterflies. Therefore, the proposed action would have no effect on the regal fritillary butterfly.

Northern Redbelly Dace
No suitable habitat for this species exists within the project area. Therefore, the proposed action would have no effect on the northern redbelly dace.

Sturgeon Chub
No suitable habitat for this species exists within the project area. Therefore, the proposed action would have no effect on the sturgeon chub.

Raptors of Concern

Ferruginous Hawk
Based on the historical records, aerial survey, and field survey, no known active or inactive ferruginous hawk nests occur in the project area. Therefore, the proposed action would have no effect on the ferruginous hawk.

Prairie Falcon
Based on the historical records and field survey, no prairie falcon nests are within 1 mile of the project area. No whitewash areas or falcons were observed during the survey. Therefore, the proposed action would have no effect on the prairie falcon.

Golden Eagle
Based on the historical records and field survey, no known golden eagle nests are within 1 mile of the project area; the nearest documented nest is 1 mile away from the project area. Given the relative proximity of the documented nest, the proposed action would have no effect on the golden eagle.

Merlin
Based on the historical records and field survey, no known active or inactive merlin nests are in the area. Therefore, the proposed action would have no effect on the merlin.

Sensitive Plant Species

Slimleaf Goosefoot
Habitat suitable for slimleaf goosefoot (i.e., sandy river terraces) does not occur within the project area. Therefore, the proposed action would have no effect on the slimleaf goosefoot.

Blue Lip's
Due to weedy and aggressive introduced species, habitat otherwise suitable for blue lip's has been degraded to the point that it is no longer suitable. Therefore, the proposed action would have no effect on blue lip's.

Torrey's Cryptantha
Inclusions of habitat suitable for Torrey's cryptantha occur on dry plains. The proposed project area includes dry plains habitat. Therefore, the proposed action may affect, but is not likely to adversely affect habitat, for Torrey's Cryptantha. The area was searched thoroughly during the field evaluation but no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of Torrey's cryptantha.

Nodding Wild Buckwheat
Small inclusions of potentially suitable habitat for nodding wild buckwheat (i.e., open sandy grasslands and hillsides) do occur in the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, habitat for nodding wild buckwheat. The area was searched thoroughly during the field evaluation but no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of nodding wild buckwheat.

Dakota Buckwheat
Inclusions of habitat for this species (i.e., areas of badlands, clay barren areas, and butte wash areas) are found within the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, habitat for Dakota buckwheat. The area was searched thoroughly during the field evaluation but no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of Dakota buckwheat.

Sand Lily
Inclusions of habitat suitable for sand lily occur on hillsides within the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, habitat for sand lily. However, the area was searched thoroughly during the field evaluation and no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of sand lily.

Scoria Lily or Dwarf Mentzelia
Inclusions of habitat suitable for scoria lily or dwarf mentzelia include arid slopes, sandy plains, or possibly hard clays and rocky soils, and do occur within the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, habitat for the scoria lily or dwarf mentzelia. However, the area was searched thoroughly during the field evaluation and no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of the scoria lily or dwarf mentzelia.

Alyssum-Leaved Phlox
Habitats suitable for alyssum-leaved phlox include: sandy or gravelly soil, clay banks, and limestone ridges of open prairie. Potential habitat does occur within the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, habitat for alyssum-leaved phlox. However, the area was searched thoroughly during the field evaluation, and no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of alyssum-leaved phlox.

Lance-Leaf (Rydberg's) Cottonwood
Habitat suitable for lance-leaf cottonwood is riparian area, which does not occur within the project area. Therefore, the proposed action would have no effect on lance-leaf (Rydberg's) cottonwood.

Alkali Sacaton
Habitat suitable for alkali sacaton occurs on hard clay areas. Potential habitat does occur within the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, habitat for alkali sacaton. The project area was searched thoroughly during the field evaluation, and despite the fact that specimens are known to occur along West River Road near the project area, no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of alkali sacaton.

Hooker's Townsendia
Habitat suitable for Hooker's townsendia occurs on plains and hillsides, which do occur within the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, habitat for Hooker's townsendia. The project area was searched thoroughly during the field evaluation but no plants of this species were observed. Therefore, the proposed action would have no effect on individual specimens of Hooker's townsendia.

Watch Plant Species (Various)
Watch plant species in a geographic area have demonstrated a downward trend of abundance over time, but have not yet met the threshold of becoming a categorically sensitive species. The watch plant species presented in Table 3-3 are not presently known to occur on the Little Missouri National Grassland or the

surrounding areas. However, portions of the area are likely suited for some of the watch plant species because many species may have a wide tolerance for habitats, while for other species the required habitat has not been closely studied and therefore has been vaguely identified (for example, "occurs on hillsides"). These facts make it difficult to predict if a species would occur on an area without a complete on-site evaluation. The project area was searched thoroughly during the field evaluation but no watch plant species were observed. Therefore, the proposed action would have no effect on the various watch plant species presented in Table 3-3.

***Cumulative Impacts* —** No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact threatened, endangered, or sensitive species, or critical habitat. However, suitable habitat for some threatened, endangered, or sensitive species does occur in the project area. Therefore, such species potentially could occur or become established in the project area in the future. Routine management for such species on the TRNP and DPG, including periodic surveys for new populations in new areas, would continue in the project area.

***Conclusion* —** The proposed action would have no effect on endangered species; may affect but not likely to adversely affect one threatened species (bald eagle) if construction activities occur during the fall and winter seasons; and may affect sensitive animal and plant species because of the presence of suitable habitat (Baird's sparrow, Sprague's pipit, loggerhead shrike, Dakota skipper, tawny crescent butterfly, ottoe skipper, Torrey's cryptantha, nodding wild buckwheat, Dakota buckwheat, sand lily, scoria lily or dwarf mentzelia, alyssum-leaved phlox, alkali sacaton, and Hooker's townsendia). The proposed action would have no effect on raptor species of concern or watch plant species.

***Impairment* —** The proposed action would not impair the threatened, endangered, or sensitive species, or critical habitat, that may occur in the project or CE areas.

4.3 HERITAGE AND CULTURAL RESOURCES

Methodology — In this EA, impacts on heritage and cultural resources (archeological resources and the cultural landscape) are described in terms of type, context, duration, and intensity, which is consistent with the CEQ regulations. These impact analyses are intended, however, to comply with the requirements of both the NEPA and Section 106 of the National Historic Preservation Act (NHPA).

In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 (36 CFR Part 800, "Protection of Historic Properties"), impacts on cultural resources were identified and evaluated by: (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that were either listed on or eligible to be listed on the National Register of Historic Places; (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed on the National Register; 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-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 on the National Register (for example, diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the preferred alternative that would occur later in time, be farther removed in distance, or be cumulative (36 CFR Part 800.5, "Assessment of Adverse Effects"). A determination of *no adverse effect* means an effect is not expected or, if expected, would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion on the National Register.

CEQ regulations and DO #12 also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (for example, 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 only under the National Environmental Policy Act. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effect remains adverse. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — Impact is at the lowest level of detection – barely measurable with no perceptible consequences, either adverse or beneficial. For purposes of Section 106, the determination of effect would be *no adverse effect*.

- Minor (adverse) — Disturbance of a site(s) results in little loss of integrity. For purposes of Section 106, the determination of effect would be *no adverse effect*.

- Minor (beneficial) — Impact would maintain and preserve the site(s). For purposes of Section 106, the determination of effect would be *no adverse effect*.

- Moderate (adverse) — Disturbance of a site(s) results in loss of integrity. For purposes of Section 106, the determination of effect would be *adverse effect*. A Memorandum of Agreement is executed and identifies mitigation measures to reduce the intensity of impact from moderate to minor.

- Moderate (beneficial) — Impact stabilizes the site(s). For purposes of Section 106, the determination of effect would be *no adverse effect*.

- Major (adverse) — Disturbance of a site(s) results in a loss of integrity. For purposes of Section 106, the determination of effect would be *adverse effect*. The NPS and historic preservation officer are unable to execute a Memorandum of Agreement.

- Major (beneficial) — Impact amounts to active intervention to preserve the site(s). For purposes of Section 106, the determination of effect would be *no adverse effect*.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

Description of the file search and cultural resource survey is presented in Section 3.3.

No Action Alternative

Analysis **—** The no action alternative would not cause any direct or indirect impacts on heritage and cultural resources because none of the sites identified in the records search is within 0.25 mile of the project area. The results of recent archaeological surveys conclude that finding other cultural materials in this area would be very unlikely. The FS Principal Investigator/Archeologist and SHPO both agreed with this assessment (FS 2005a, State Historical Society of North Dakota 2005).

Cumulative Impacts **—** No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact heritage and cultural resources.

Conclusion — The no action alternative would have negligible long-term impacts on the heritage and cultural resources of the project or CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the heritage and cultural resources known in, or that may occur in, the project or CE areas.

Proposed Action

Analysis — The proposed action would not cause any direct or indirect impacts on heritage and cultural resources because none of the sites identified in the records search is within 0.25 mile of the project area. The results of recent archaeological surveys conclude that finding other cultural materials in this area would be very unlikely. The FS Principal Investigator/Archeologist and SHPO both agreed with this assessment in letters of concurrence (FS 2005a, State Historical Society of North Dakota 2005).

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact heritage and cultural resources.

Conclusion — The proposed action would have negligible long-term impacts on the heritage and cultural resources of the project or CE areas through natural ecological processes.

Impairment — The proposed action would not impair the heritage and cultural resources known in, or that may occur in, the project or CE areas.

4.4 SOCIAL RESOURCES

This section provides information on the potential impacts on wilderness, scenery resources, transportation and roads, and recreation resources of the TRNP and DPG area.

4.4.1 Wilderness

Methodology — Impact analyses focus on wilderness character or wilderness experience, including the perpetuation of natural ecological relationships and processes, continued existence of native wildlife and vegetation populations, absence of permanent human structures, opportunities for solitude, and opportunities for primitive and unconfined recreation. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — Little or no change would occur in wilderness character or wilderness experience. Any change would not be perceptible, or would be barely perceptible, to most visitors.

- Minor — One or more attributes of wilderness character and wilderness experience change temporarily or in small ways in one or more locations. Any change would noticeably impact a few visitors' experiences, but would result in little distraction from the quality of the experience.

- Moderate — One or more attributes of wilderness character and wilderness experience change substantially in a single distinct region, or affect multiple regions; however, the change is not permanent and does not affect an entire visitor season. The change would noticeably decrease or improve the quality of the experience for a large number of visitors.

- Major — One or more attributes of wilderness character and wilderness experience change substantially across more than one distinct region, on either a permanent or frequent but temporary basis, and over an entire visitor season. The change substantially improves many

visitors' experiences or severely lowers the quality of many visitors' experiences; examples include addition or elimination of a recreation opportunity or a permanent change to an area.

- Duration — Duration can be defined as either short-term or long-term, as follows:
  - Short-Term — Lasting only during the construction period or no longer than one year.
  - Long-Term — Essentially a permanent or post-construction impact.

No Action Alternative

Analysis — The no action alternative would not cause any direct or indirect impacts on the perpetuation of natural ecological relationships and processes, continued existence of native wildlife and vegetation populations, opportunities for solitude, and opportunities for primitive and unconfined recreation. The no action alternative would cause indirect, negligible impacts from the continued presence of a permanent human structure near the southern boundary of the wilderness area to the north of the project area – the existing NPS radio tower in the project area. The existing radio tower can be seen from the wilderness area to the north of the project area (see Appendix D).

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact wilderness resources.

Conclusion — The no action alternative would have negligible long-term impacts on the wilderness resources north of the project area because of the continued presence of the existing radio tower.

Impairment — The no action alternative would not impair the wilderness resources near the project or CE areas.

Proposed Action

Analysis — The proposed action would not cause any direct or indirect impacts on the perpetuation of natural ecological relationships and processes, continued existence of native wildlife and vegetation populations, opportunities for solitude, and opportunities for primitive and unconfined recreation. The proposed action would cause indirect, negligible impacts from the presence of a permanent human structure near the southern boundary of the wilderness area to the north of the project area – the proposed telecommunications tower. The proposed tower would be seen from the wilderness area to the north of the project area (see Appendix D). However, since the proposed tower would be the same height as the existing radio tower, there would be no change to the current conditions and current impacts on wilderness resources caused by the existing tower.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact wilderness resources.

Conclusion — The proposed action would have negligible long-term impacts on the wilderness resources north of the project area because of the continued presence of a tower of the same height as the existing radio tower.

Impairment — The proposed action would not impair the wilderness resources near the project or CE areas.

4.4.2 Scenery Resources

Methodology — Impact analysis focuses on the effects of the no action alternative and proposed action on scenery resources, including visitors' experience of observing the landscape and wildlife, impacts on scenic views, and encroachment of development that impacts scenery resources. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — Any change would not be perceptible, or would be barely perceptible, to most visitors.
- Minor — Any change would impact the experience of a few visitors but would result in little change in the quality of the experience.
- Moderate — Any change would impact the experience of a large number of visitors, noticeably decreasing or improving the quality of the experience.
- Major — Any change would substantially improve or severely lower the quality of many visitors' experience; examples include addition or elimination of a scenery resource or a permanent change to an area.
- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

No Action Alternative

Analysis — The no action alternative would leave the project area unchanged in terms of visitors' experience of observing the landscape and wildlife, scenic views, and encroachment of development that impacts scenery resources. The existing tower is currently in the viewshed and would continue to impact the viewshed (see Appendix D).

Cumulative Impacts — Verizon Wireless has not proposed any specific alternate locations for the proposed tower at this time because it was determined during the planning stage of the project that building a new tower on non-federal land would generally have significant negative impacts on the scenery and viewsheds of the region. However, should the NPS or the FS decide not to issue the respective permits to Verizon Wireless, the company would more than likely seek alternate locations on non-federal land for the proposed telecommunications tower, to meet the stated need of satisfying the growing demand for commercial and personal communication in the region. Many factors would dictate a specific, alternate location for the proposed facility, including specific radio frequency and coverage requirements of expanding the Verizon Wireless network, but possibly Verizon Wireless would construct an additional tower on nearby, non-federal land in the immediate vicinity and sightline of the existing NPS radio tower. Therefore, in general terms, if the application for permits was denied by the NPS and FS, and if Verizon Wireless selected an alternate location near the proposed project area, the scenery of the region would be negatively impacted by construction of an additional tower (thereby increasing the cumulative number of towers by one). If this scenario developed, it would have the potential to negatively impact TRNP visitor experiences, since a primary reason citizens visit the TRNP is to see the beauty of the North Dakota badlands and prairie scenery, and to observe the wildlife. The viewshed from the nearby wilderness area also would be potentially impacted if Verizon Wireless located an additional tower on non-federal lands near the existing tower.

Conclusion — The no action alternative would have the potential to cause minor, local and regional, long-term impacts on the scenery resources of the TRNP, DPG, and the local communities.

Impairment — The no action alternative would not impair the scenery resources, beyond the existing condition, near the project or CE areas.

Proposed Action

Analysis — The proposed action would have minor, long-term impacts on the scenery resources of the area due to a slight difference between the equipment mounted on the existing tower and the equipment proposed to be mounted on the proposed tower. Also, an additional small equipment shed would be constructed within the project area. The existing tower is 180 feet high with a 16.75-inch face and steel diameters of 1.25 inches. The replacement tower is proposed to be 180 feet high and have a 24-inch face (measured center to center); would be a solid steel structure; and would use steel diameters varying from 1.25 inches to 1.75 inches at the bottom of the tower, and 1.25 inches at the top of the tower. The pre-fabricated equipment shed would encompass an area 12 feet by 30 feet. These equipment changes would cause minor differences in how the proposed facility would impact the viewshed, as compared to the existing impacts on the viewshed (see Appendix D for photographic simulations of the existing and proposed conditions). The proposed equipment modifications would cause minor, long-term impacts on the nearby wilderness area, as the site would support an additional equipment shed and additional equipment (microwave dish) that would be seen from the southern boundary of the wilderness area.

The proposed action would also have minor, long-term impacts on the scenery resources of the area due to a slight difference between the existing NFSR and the proposed reconstruction. NFSR #730A-2 is an existing feature on the landscape, and the proposed reconstruction is designed to minimize visual impacts of the road on adjacent lands, allowing the road to remain, as much as possible, subordinate to the natural landscape. The proposed reconstruction would cause only minor differences to the road, including grading and application of surfacing and gravel along specific segments of the existing road corridor. Additionally, total reconstruction of approximately 2000 feet around the switchback (corner) would be necessary. NFSR #730A-2 would maintain the Scenic Integrity Objective of High for the project area.

Cumulative Impacts — The proposed action could have minor, local and regional, long-term, beneficial impacts on the scenery resources of the TRNP, DPG, and the local communities. By replacing the existing tower with one of equal height, the net number of towers would remain constant and the viewshed would not be negatively impacted by the possibility of construction of an additional tower on non-federal lands in the region. Additional minor, long-term impacts from the proposed road reconstruction would occur, although reconstruction would allow the road to remain, as much as possible, subordinate to the natural landscape. NFSR #730A-2 would maintain the Scenic Integrity Objective of High for the project area.

Conclusion — The proposed action would have minor, site-specific and local, long-term impacts on scenery resources resulting from a change in the equipment supported by the proposed tower, and the proposed road reconstruction. The proposed action would also have the possibility of causing minor, local and regional, long-term, beneficial impacts by replacing a tower instead of building a new tower in the viewshed.

Impairment — The proposed action would not impair the scenery resources near the project or CE areas.

4.4.3 Transportation and Roads

Methodology — The Transportation Rule and Policy (66 Federal Register [FR] 3206 and 3219 [Transportation Policy]) requires the FS to determine a minimum road system—determining roads needed (classified) and unneeded (unclassified). Decisions on needed and unneeded roads are accomplished through area/project planning with NEPA analyses and public participation. The Transportation Policy also requires a roads analysis process to inform road management decisions. A roads analysis process (watershed or project area scale) must be prepared before most road management decisions to construct or reconstruct roads throughout the National Forest System lands (whether they be inventoried roadless or not), as of January 12, 2002.

The FS completed a roads analysis for the proposed reconstruction and upgrade NFSR #730A-2. The roads analysis for the proposed project provided the following recommendations and findings for the proposed reconstruction of the NFSR (FS 2005b):

- No soil or hydrology related issues are associated with this proposed road project. The route follows an existing two-track, Maintenance Level 2 road. The route is well located along the drainage divide for much of its length. This location minimizes erosion and overland flow.

- Native seed mixes would be required for all re-vegetation efforts, and the site-specific seed mixture would be specified by the FS in the Private Road Special Use Permit.

- The reconstructed road would provide safe access to the proposed communications tower, and the upgraded communications tower would enhance cellular telephone communications for the general public.

- The road would be placed on the surface in a manner that minimizes the amount of surface used; minimizes impacts; reduces visual impacts through road location and type of surfacing material; minimizes risk to wildlife or rare and unique botanical resources; ensures that cultural resources would not be adversely affected; minimizes impacts on soil and soil erosion; and ensures required reclamation and re-vegetation activities are successfully completed.

- The FS would monitor road construction and maintenance, and ensure completion of tri-annual road condition surveys.

- Upon removal of the proposed communications tower, the road could be reduced back to the original two-track configuration, and maintenance would be reduced.

The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — Visitors would not likely be aware of the effects associated with changes proposed to transportation corridors and roads.

- Minor — Visitors would be aware of the effects associated with changes proposed to transportation corridors and roads, but impacts would be slight and short-term.

- Moderate — Visitors would be aware of the effects associated with changes proposed to transportation corridors and roads; impacts would be readily apparent and long-term.

- Major — Visitors would be aware of the effects associated with changes proposed to transportation corridors and roads; impacts would be readily apparent and long-term, and would preclude experience of local resources by some future visitors.

- Duration — Duration can be defined as either short-term or long-term, as follows:
  - Short-Term — Lasting only during the construction period or no longer than one year.
  - Long-Term — Essentially a permanent or post-construction impact.

No Action Alternative

Analysis — The no action alternative would leave the project area unchanged in terms of the transportation systems and roads in the project and CE areas.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact transportation and roads.

Conclusion — The no action alternative would have negligible long-term impacts on the transportation and roads of the project and CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the transportation and roads of the project or CE areas.

Proposed Action

Analysis — Traffic flow on the proposed road would slightly increase, as Verizon Wireless employees would conduct normal maintenance of the tower equipment on a regular schedule (usually monthly) during off-peak hours. This would result in minor, site-specific and local, long-term impacts. Also, emergency or alarm calls to the tower would also require access via the proposed road. The number of these types of visits to the site can be estimated at six per year. Additionally, an improved road surface would increase access to the site and area.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact transportation and roads.

Conclusion — The proposed action would have minor, site-specific and local, short- and long-term impacts from road reconstruction and minor increase in traffic flow. The proposed action would also have minor, local, long-term beneficial impacts by increasing the quality of the road.

Impairment — The no action alternative would not impair the transportation and roads of the project or CE areas.

4.4.4 Recreation

Methodology — Impact analysis focuses on the effects of the no action alternative and proposed action on recreation, including changes to recreational opportunities and visitors' experiences. The thresholds of change for intensity of impacts and the duration of impacts are:

- Negligible — Any change to recreational opportunities would not be perceptible, or would be barely perceptible, to most visitors.

- Minor — Any change to recreational opportunities would noticeably impact experience of a few visitors experiences, but would result in little distraction from the quality of the experience.

- Moderate — Any change to recreational opportunities would impact experience of a large number of visitors, noticeably decreasing or improving the quality of the experience.

- Major — Any change to recreational opportunities would substantially improve or severely lower experience of many visitors; examples include addition or elimination of a recreation opportunity or a permanent change to an area.

- Duration — Duration can be defined as either short-term or long-term, as follows:
    - Short-Term — Lasting only during the construction period or no longer than one year.
    - Long-Term — Essentially a permanent or post-construction impact.

No Action Alternative

Analysis — The no action alternative would leave the project area unchanged in terms of the recreational opportunities and visitors' experiences in the project and CE areas.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact recreation resources.

Conclusion — The no action alternative would have negligible long-term impacts on the recreation resources of the project and CE areas through natural ecological processes.

Impairment — The no action alternative would not impair the recreation resources of the project or CE areas.

Proposed Action

Analysis — By improving the existing road, the proposed action would allow visitors easier access to this portion of the TRNP and DPG. Improved access might increase the likelihood of wildlife poaching in the area, which may , increase the need for additional patrol of the area.

Cumulative Impacts — No present, ongoing, or reasonably foreseeable future actions are planned for the project area or CE area that would impact recreation resources.

Conclusion — The proposed action would have minor, site-specific and local, long-term impacts on recreation in the area.

Impairment — The proposed action would not impair the recreation resources of the project or CE areas.