CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences, or potential impacts, on the natural, cultural and human environment on Cotterel Mountain from implementation of the alternatives considered in this Draft Environmental Impact Statement (EIS). The topics discussed are by resource, in the same order as those described in Chapter 3, Affected Environment.

For each topic, the impact analysis follows the same general approach. Impact indicators for intensity of impacts were developed based on individual resources. A study area, or area of impact analysis, was also specified for each topic and impact duration definitions (short-term, long-term) were assessed where applicable. Impacts were then identified and assessed based on these definitions and indicators; a review of relevant scientific literature, previously prepared environmental documents (Cassia Resource Management Plan (RMP)), and the best professional judgment of Interdisciplinary Team (IDT) resource specialists.

Much of the information on the affected environment and potential environmental consequences is derived from detailed technical reports prepared by Bureau of Land Management (BLM) specialists, the URS Group, Inc. (URS), and subcontractors to the prime consultant. These reports are available for review as part of the Analysis File maintained for this Proposed Project at the Burley Field Office (BFO).

Knowledge is, and always will be, incomplete regarding many aspects of the terrestrial species, vegetative communities, the economy, and communities and their interrelationships. The ecology, inventory, and management of ecosystems are a complex and evolving discipline. However, basic ecological relationships are well established, and a substantial amount of credible information about ecosystems in the Proposed Project area is known. The alternatives were evaluated using the best available information about these ecosystems. While additional information may add precision to estimates or better specify relationships, new information would be unlikely to appreciably change the understanding of the relationships that form the basis for the evaluation of effects.

The numbers generated and used for comparison of impacts are for analysis purposes only. The exact location and size of the Proposed Project features cannot be determined until a final document is completed. Therefore, the exact areas of impact to specific resources are estimates based on the best available information at the time of this writing.

4.1 DIRECT AND INDIRECT EFFECTS

Effects are described in general terms and are qualified as short-term and long-term, as appropriate. Impacts may also be described as direct or indirect. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by an action and occur later in time or farther removed from the area, but are reasonably foreseeable.

4.2 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) requires assessment of cumulative effects in the decision-making process for federal projects. Cumulative effects are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 Code of Federal Regulations (CFR) 1508.7). Cumulative effects are considered for each resource.

Cumulative effects were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing, or reasonably foreseeable future actions in this area and in the surrounding landscape. All resource impacts would be added to these actions to present the cumulative picture or incremental contribution this Proposed Project would have on the resources.

4.3 PAST/PRESENT ACTIONS

Past use of the Proposed Project area has included: livestock and wildlife grazing; recreation including hunting, off-highway vehicle (OHV) use, sightseeing, camping, mountain biking, horseback riding, and wildlife sightseeing; and siting of communication facilities (microwave and cell phone transmitters). These uses continue through the present and are anticipated to continue into the reasonably near future.

4.4 FUTURE FORSEEABLE ACTIONS

On Cotterel Mountain, future foreseeable actions, other than the Proposed Project, would be limited to general recreation, OHV use, hunting, and grazing.

The Idaho Transportation Department is proposing to reconstruct a portion of the City of Rocks Back County Byway between Elba and Almo, Idaho. This 17-mile stretch of road would be built in phases with completion of the Proposed Project occurring in 2007 or 2008.

At this time, there are no other wind projects planned for the Cotterel Mountain area. However, other wind plant sites or other energy developments on public lands in Idaho may be considered in support of the President’s National Energy Policy, which encourages the development of renewable energy resources, including wind energy. Other potential future actions associated with energy development would include:

- The firm U.S. Geothermal is conducting exploratory geophysical exploration on private and BLM managed lands south of Jim Sage Mountain, which is south of the Proposed Project area. It is the goal of U.S. Geothermal to develop a commercially viable geothermal electrical generation facility on private land in this area. Their proposed development would be approximately 25 miles south of the proposed Cotterel Wind Power Project (Proposed Project).

- Currently there are three other wind energy rights-of-way (ROW) applications on BLM managed lands in Idaho. These sites are located at Danskin Mountain, north of Mountain Home, north of Glenns Ferry, and at Brown's Bench southwest of Twin Falls. These projects are in various phases of wind speed monitoring. There is no guarantee that these projects will result in the construction of wind energy facilities at these sites.

- On private lands in Idaho, there are currently two operating wind power projects. One project located between Boise and Mountain Home consists of three operational wind turbines. The other project, located near Hagerman and South of the Snake River has seven operational wind turbines. Currently, there are other proposed wind power projects on private land that have received county approval for construction: a trio of 200 megawatts (MW) projects near Idaho Falls, by Ridgeline/Airtricity; a pair of 200 MW projects near American Falls, by Ridgeline/Airtricity; a 200 MW project near American Falls, by Windland, Inc. (Windland); and four 10 MW projects near Hagerman.

- There are currently over 30 wind-monitoring towers collecting data on wind speed scattered across eastern, southcentral, southern and western Idaho. These towers are located on private, state, Tribal, and federal lands. Whether these sites would be developed into commercially viable wind power projects is unknown at this time.

4.5 PHYSICAL RESOURCES

4.5.1 Climate and Air Quality

This section describes air quality impacts that could result from construction and operation of the Proposed Project. Wind power projects do not involve the combustion of fuels to generate electricity, so there are no air quality impacts from the generation of power. Any air quality impacts would be related to emissions from vehicles and from fugitive dust associated with construction and operations and maintenance (O&M) activities. The Proposed Project would not result in any impacts to the climate.

Alternative A

Under Alternative A there would be no new sources of emissions or fugitive dust. Existing recreational use would continue resulting in minor amounts of emissions from the exhaust of OHV. Small amounts of fugitive dust would be generated from OHV use and cattle trailing. Fugitive dust from wind erosion of the existing native surface roads would continue to occur. Smoke from possible wildland fires could result in a temporary reduction of air quality standards.

Alternative B

Construction

Temporary and localized increases in criteria pollutant concentrations would occur during the construction phase of the Proposed Project. Expected emissions would consist of tailpipe emissions from the exhaust of construction equipment, particulate matter emissions from the concrete batch plants, combustion emissions from the diesel-fueled generators associated with the concrete batch plants, fugitive dust missions from vehicular traffic, and fugitive dust emissions from soil and rock disturbances. Since construction-related air pollution effects would be temporary and localized no impact on air quality or ambient values in the study area would occur. These temporary and localized potential emissions increases are not expected to have an appreciable impact on air quality.

Operation

The operation of the Proposed Project would not impact air quality.

Alternative C

Impacts to air quality for Alternative C would be similar to those described under Alternative B; however, the temporary affects would be slightly less due to smaller area disturbed by construction.

Alternative D

Impacts to air quality for Alternative D would be similar those described under Alternative B. Alternative D would result in the least amount of ground disturbance and would likely have a shorter construction period. Therefore, the temporary affects to air quality would be the least of all the action alternatives.

4.5.2 Geology

The primary impacts on geology associated with the Proposed Project are tied to the area of bedrock disturbance identified for each alternative. The type of bedrock disturbance would be different for each turbine location and roadway. The impacts would also be dependent on the number of acres of associated geologic disturbance, as well as the number and distribution of turbines and roadways proposed under each of the alternatives.

Alternative A (No Action)

Under Alternative A, no impacts related to geology would occur.

Alternative B

Under Alternative B, the proposed construction would have a permanent footprint of approximately 203 acres due to blasting to set foundations for wind turbine pads and road construction. Because best management practices (BMP) would be used during construction (Appendix C), impacts regarding landslides and erosion potential would be minimized.

Earthquake induced landslide areas are apparent at the northeastern side of the study area. However, no literature could be located that documents these events (Griggs 2004). The potential for movement along faults and new landslides in the Proposed Project vicinity is considered low. The Proposed Project would be designed and constructed with appropriate seismic design codes, including foundations for the wind turbines placed directly on competent rock.

Alternative C

The proposed construction would have a permanent footprint of approximately 203 acres due to blasting to set foundations for wind turbine pads and road construction. Construction activities from Alternative C would less than those discussed under Alternative B because there would be less blasting and construction due to the placement of fewer turbines.

Alternative D

The proposed construction would have a permanent footprint of approximately 158 acres due to blasting to set foundations for wind turbine pads and road construction. Construction activities from Alternative D would less than those discussed under Alternative B or Alternative C because there would be less blasting and construction due to the placing of fewer turbines and roads. Impacts to geology from building the Proposed Project would be the least under Alternative D.

4.5.3 Soils

The primary impacts on soils associated with the Proposed Project are tied to the area of surface disturbance identified for each alternative. Although the type of surface disturbance would be similar for each turbine location and roadway, the impacts would be dependent on the number of acres of associated soil disturbance, as well as the number and distribution of turbines and roadways proposed under each of the alternatives. Impacts to soils would be minimized during construction using the BMP described in Appendix C.

Alternative A (No Action)

Under Alternative A, no impacts to soils from the Proposed Project would occur.

Alternative B

Under Alternative B, impacts to soils would be directly related to acres of surface disturbance. Soils would be disturbed, mixed structurally, compacted, and exposed to erosion during construction, possibly resulting in a temporary increase in erosion and windblown dust on up to approximately 368 acres (3% of Proposed Project area) until construction is completed (Table 4.5-1). Following construction, approximately 165 acres would be reclaimed. Post construction permanent impacts would affect about 203 acres (2% of Proposed Project area) of soils in the Proposed Project area. The construction of roads and turbines would impact soils by mechanically breaking down the soil structure, which would increase the erosion potential. Impacts to soils would indirectly impact vegetation and the ability to re-vegetate after construction.

Table 4.5-1 Acres of Soil Disturbance Under Each Alternative.

Soil Group	Alternative B	Alternative C		Alternative D		Erosion Potential Hazard
Size of turbine (meters)	**70**	**77**	**100**	**77**	**100**	
Group 1	19	17	17	15	15	Moderate to severe
Group 2	1	1	1	1	1	Slight to moderate
Group 3	0	0	0	0	0	Slight to moderate
Group 4	23	72	72	73	73	High
Group 5	137	105	105	69	69	Moderate to severe
Group 6	22	8	8	0.4	0.4	Severe
Total temporary	164	144	131	121	109	
Total permanent	201	203	203	158	158	

Alternative C

The size of the temporarily disturbed areas varies only slightly based on type of turbines selected. Alternative C would initially impact between approximately 337 to 350 acres (3% of Proposed Project area) of soils in the Proposed Project area. Following construction, between approximately 134 to 147 acres would be reclaimed, resulting in about 203 acres (2% of Proposed Project area) of permanent impacts to soils within the Proposed Project area. Overall impacts to soils under Alternative C would be similar to those described under Alternative B.

Alternative D

Impacts to soils from construction and operation of the Proposed Project would be the least under Alternative D. The size of the temporarily disturbed areas varies only slightly based on type of turbines selected. Alternative D would initially impact approximately 269 to 270 acres (2% of Proposed Project area) depending upon which turbine is selected. Permanently disturbed acres would be about the same for both turbine sizes of about 158 acres (<1.5% of Proposed Project area) and would have similar impacts as described under Alternative B.

4.5.4 Water Resources

Alternative A (No Action)

Under Alternative A, no additional impacts to water resources would occur.

Alternative B

Impacts to surface and groundwater quality and quantity would be low under Alternative B. There are 14 springs, three spring developments, and one well located within the Proposed Project area boundary. There are also springs, livestock water wells, pipelines, and storage facilities in close proximity to the Proposed Project area. Potential impacts to water resources would be minimized using BMP during construction. Impacts due to accidental spills of hazardous materials (Section 4.14) would be low due to BMP used during construction and project O&M. Water used during construction would come from a source outside the Proposed Project area.

Some of the road building, and all of the tower foundations would require the blasting of bedrock in a controlled fashion to break the rock just sufficiently to allow for easier excavation. Impacts to springs in the Proposed Project area from blasting are not anticipated. This is due to the type of ground water flow system that produces the springs. Two factors are considered as being favorable for maintaining spring flow: (1) blasting is not anticipated to affect rock at any great distance from the tower locations, and (2) any rock disturbance that might occur would most likely produce additional vertical fracturing in the bedrock without affecting the lateral flow of ground water as it moves down gradient off the mountain crest. This increase in secondary porosity would actually mimic the existing flow system, whereby precipitation and snow melt provide recharge water via vertical columnar jointing in the volcanic flow that forms the surface rock over most of the Proposed Project area. Thus, the overall mechanism of ground water flow would not be affected by blasting operations (see Chapter 3 for description of ground water flow).

Potential impacts from construction of the Proposed Project to 303d listed streams would be limited to potential delivery of sediment to these water bodies. However, because there is no surface flow within the Proposed Project area where construction activities would occur, it would be unlikely that sediment would reach the 303d listed streams. Furthermore, construction activities would be required to follow BMP including erosion control and soils management techniques. These BMP would be employed during construction, O&M, and decommissioning, and are expected to prevent fine sediments from being introduced into drainages above existing levels. Therefore, the Proposed Project is not expected to impact the 303d listed streams that are located near the Proposed Project area.

Alternative C

Construction activities from Alternative C would approximate those for Alternative B, and would be expected to have a low impact to water resources in the Proposed Project area.

Alternative D

Construction activities from Alternative D would approximate those for Alternative B and Alternative C, and would be expected to have a low impact to water resources in the Proposed Project area.

4.5.5 Noise

Construction Impacts

The Proposed Project area is relatively remote and unpopulated. The nearest residence is located approximately two miles west of the proposed turbine string. There are a number of residences along State Highway (SH)-77 and SH-81 in the towns of Declo, Albion, Connor and Malta.

Construction would create the greatest project related noise impacts. The frequency and duration would vary with the amount of construction in each action alternative. In all of the action alternatives, noise would occur from construction equipment and other vehicles associated with road and turbine string construction. During the eight-month construction period, there would be approximately 2,205 trips of large trucks delivering the turbine components and related equipment, and approximately 12,735 trips including dump trucks, concrete trucks, cranes, and other construction and trade vehicles. Power tools such as pneumatic wrenches, vibrators, and saws would add temporarily to the overall noise level. Using typical construction site noise levels (United States (U.S.) Environmental Protection Agency (EPA) 1974), noise levels during construction would be expected to range from 68 A-weighted decibels (dBA) to infrequent peaks of up to 95 dBA at 50 feet from the operating equipment. Construction noise caused by the Proposed Project may temporarily impact people and wildlife. However, the nearest resident is located approximately two miles west of the Proposed Project construction area.

Blasting activity for the proposed construction would occur as needed in all action alternatives. The noise from blasts can extend for a few miles when geographical and atmospheric conditions are conducive. However, such noise would be infrequent and of short duration. Blasting would only be conducted during daylight hours. The vibration levels, which result from blasting, would not be anticipated to be of sufficient magnitude to adversely impact structures, because most of the blasting would occur along the Cotterel Mountain ridgeline well away from any structures or residences. Therefore, it is not anticipated that blasting would impact any residences or communities near the Proposed Project area.

Visitors to the Proposed Project area during construction periods could be impacted by noise, based upon the proximity and type of construction activity. Within some portions of the Proposed Project area, topographic features would function to restrict most of the construction noise to the immediate vicinity of the construction activities. With rare exceptions, construction-related noise impacts would be limited to daytime hours. Impacts to nesting wildlife would be minimized by restricting construction activities during certain nesting periods (Appendix C and Appendix D).

Operational Impacts

Sound travel outdoors, especially over distances greater than 200 to 300 feet from a sound source, and is highly dependent on weather conditions. The atmospheric conditions that affect sound travel the most are temperature variations, wind currents, and humidity. Sound tends to travel farther than expected when it is traveling with the wind.

As noise spreads out from a source, the sound intensity would drop at a rate of three decibels (dB) per doubling of distance for a line source such as a road and at six dB per doubling of distance for a point source such as truck or piece of heavy equipment. The type of ground (hard or soft, vegetated or unvegetated) can affect this rate of drop in the sound level as well as natural barriers.

Modern wind turbines are designed with large rotor diameters that have very low rotational speeds. Efficient power generation is achieved at these low rotational speeds, thereby reducing noise impacts that would result from higher rotational speeds. The rotor blades make a slight swishing sound when rotating. Because of these technological advances and the distance of the blades from the ground (minimum of 95 feet), even when standing immediately underneath a turbine, this noise is anticipated to be minimal. Furthermore, as wind speeds increase, the sound made from the wind passing over the human ear is typically louder than and drowns out the swishing sound of the rotating turbine blades.

Vibration-reducing features are incorporated into the design of the turbines. On large modern wind turbines, the chassis frame of the nacelle is designed to ensure the frame would not vibrate as a result of movement of the other turbine components. As discussed in Chapter 2, regular maintenance is scheduled for the structures. Routine maintenance would also reduce the likelihood of excessive noise and vibration from worn parts or lack of lubricating oils. Therefore, minimal noise and vibration is anticipated to result from the operation of the wind turbines.

Alternative A (No Action)

Under Alternative A, existing background noise levels in the Proposed Project area and Proposed Project vicinity would continue without influence of the Proposed Project. Existing sources of noise that would continue to occur under Alternative A include: recreational users such as OHVs; snowmobile riders; occasional low flying aircraft; agricultural equipment; and traffic on area roads and highways such as SH-77, SH-81, and Interstate 84 (I-84).

Alternative B

Noise impacts due to construction are expected to be low during the construction period. The transportation noise from large trucks during the initial construction period would be temporary (eight months). Operational impacts from noise would not be expected to occur. Noise generated by the operating wind turbines would most likely dissipate prior to reaching residences that are located over two miles from the Proposed Project. Recreational users of Cotterel Mountain when standing near or under the operating wind turbines would hear the swishing sound of the rotor blades. Whether this swishing sound is bothersome would likely depend upon the individual.

Alternative C

Under Alternative C, impacts from noise as a result of construction and operational activities would be the same as Alternative B.

Alternative D

Under Alternative D, impacts from noise as a result of construction and operational activities would be similar to Alternative B and Alternative C. However, Alternative D would have fewer turbines and therefore would have less potential to affect recreational users of the mountain as a result of operational noise.

4.6 BIOLOGICAL RESOURCES

4.6.1 Vegetation

This section discusses the potential impacts to vegetation resulting from implementation of the alternatives. This analysis describes how the proposed activity could directly, indirectly, and cumulatively affect community composition and dynamics. The analysis takes into account existing and future vegetation population and distribution patterns.

The primary impacts on vegetation associated with the Proposed Project are tied to the vegetation community affected and the area of surface disturbance identified for each alternative. Although the type of surface disturbance would be similar for each turbine location and roadway, the impacts would be dependent on the number of acres of associated vegetation, as well as the number and distribution of turbines and roadways proposed under each of the alternatives. For this analysis, acres were used for each vegetation type affected for the entire Proposed Project rather than a site-by-site basis.

Alternative A (No Action)

Direct and indirect impacts to vegetation in the area would be associated with activities currently outlined in the Cassia RMP including: wildlife use, continued livestock grazing, vegetation treatments, range improvement projects, recreation, and some minor modifications and alterations to the existing communication facilities. These uses and potential modifications are not expected to alter the existing vegetation beyond the levels identified in the Cassia RMP.

Alternative B

Construction impacts associated with Alternative B would initially affect approximately 368 acres (3%) of the Proposed Project area. Post-construction reclamation would restore vegetation to approximately 165 acres (45%) of this affected area. It could take 20 to 40 years or more for reclaimed areas to return to their pre-disturbance community types. It should be noted that approximately ten percent to 20 percent of the temporarily disturbed sites could have shallow soils that would have a low probability of successful restoration. The result would be a permanent impact to approximately 203 acres (2%) of the Proposed Project area.

Vegetation community types that would be directly affected from construction activities include: juniper; mountain mahogany; big, low, and mountain sagebrush; grasslands; and some riparian sites (Table 4.6-1). Approximately one-tenth acre (less than 1% of the Proposed Project area) of riparian habitat along Marsh Creek would be affected as a result of culvert replacement and road improvement of the south access road. Agricultural land, aspen communities, and open water sites would not be affected by this alternative.

The construction of roadways and turbines throughout the Proposed Project area would directly impact vegetation and special status plant species by reducing established native communities and habitat. It could also indirectly impact vegetation and special status species habitat by mechanically impacting soils, increasing the potential for establishment and spread of invasive and noxious weed species, and potentially alter the fire regime within the system.

Construction activities such as trampling, surface disturbance, accidental spills, or burning would directly impact established native communities, including non-vascular and special status species populations. These impacts would decrease the number of individuals available for fertilization and seed production, reducing the potential number of seeds for reestablishment and genetic variability of subsequent generations; therefore, short-term and long-term direct impacts to vegetation would limit the capacity of these communities to reestablish.

Mechanical effects to soil from construction activities, such as surface disturbance or soil compaction, would indirectly affect vegetation and special status species by impacting soil structure and function. Surface disturbances from excavation and blasting could lead to increased erosion potential and the loss of topsoil. The loss of this soil layer could result in: diminished structural support for, and exposure of, root systems; a reduction of available nutrients for established plants; and a diminished seed bank. Soil compaction on the other hand, could reduce water infiltration, restricted root depth, and limited seed germination. Individually, or a compilation of these two impacts, could indirectly lead to further reductions in native plant communities and potential for reestablishment.

Surface disturbances from construction activities could also indirectly impact vegetation and special status species by creating habitat for invasive species, or increasing the susceptibility of the system to new invasive species and noxious weeds from external sources. The establishment and spread of these species would lead to increased direct competition for limited resources (nutrients, water, space, etc.) with native and desired plant species. Indirectly, invasive and noxious weed species could augment the amount and continuity of fuels, which could lead to increased fire return intervals (Peters and Bunting 1994; Whisenant 1990). The compilation of increased fire return intervals and competition for resources could appreciably alter community dynamics (fire frequency and severity, soil stability, nutrient cycling, etc.); therefore, surface disturbances would likely have short-term and potentially long-term impacts on vegetation and special status species. Maintenance activities may also redisturb native and/or restored vegetation communities and continue to provide sites for invasive vegetation.

Table 4.6-1. Permanent and Temporary Impacts to Vegetation (in acres) from the Proposed Project.

	Alternative B			Alternative C 77m to 100m			Alternative D 77m to 100m		
Vegetation Community	**Permanent Impact**	**Temporary Construction Impacts**	*TOTAL*	**Permanent Impact**	**Temporary Construction Impacts**	*TOTAL*	**Permanent Impact**	**Temporary Construction Impacts**	*TOTAL*
Aspen	0	0	0	0	0	0	0	0	0
Juniper	17	14	31	9	6 to 7	15 to 16	6	4 to 5	10 to 11
Juniper/mountain mahogany	13	11	24	13	9	22	12	8 to 9	20 to 21
Mountain mahogany	14	11	25	13	9	22	11	8 to 9	19 to 20
Big sagebrush	12	10	22	2	1	3	1	1	2
Mountain sagebrush	26	21	47	13	9	22	5	4	9
Mountain sage/low sage	15	12	27	15	10 to 11	25 to 26	10	7 to 8	17 to 18
Low sagebrush	40	32	72	32	21 to 23	53 to 55	12	8 to 9	20 to 21
Grassland	38	31	69	86	57 to 62	143 to 148	85	60 to 67	145 to 153
Agricultural	0	0	0	0	0	0	0	0	0
Disturbed/existing roads	26	21	47	18	12 to 13	30 to 31	15	11 to 12	26 to 27
Open water	0	0	0	0	0	0	0	0	0
Riparian	0.1	0.1	0.2	0	0	0	0	0	0
Rock outcrop	2	2	4	2	1	3	1	1	2
Total	203	165	368	203	134 to 147	337 to 350	158	111 to 123	269 to 282

Alternative C

Construction impacts associated with Alternative C would initially affect approximately 337 to 350 acres (3%) of the Proposed Project area. Post-construction reclamation would restore approximately 134 to 147 acres (40% to 42%) of this affected area. However, it should be noted that approximately ten percent to 20 percent of the temporarily disturbed sites could have shallow soils that would have a low probability of successful restoration. The result would be a permanent impact to approximately 203 acres (2%) of the Proposed Project area.

Vegetation community types that would be directly affected from construction activities include: juniper; mountain mahogany; big, low, and mountain sagebrush; grasslands; and some riparian sites (Table 4.6-1). Agricultural land, aspen communities, and open water sites would not be affected by this alternative.

Impacts to vegetation and special status plants species from construction activities would be similar to Alternative B. The number of acres permanently affected would be the same as Alternative B. However, under Alternative C, the total acres of vegetation affected by both temporary and permanent impacts would be less (Table 4.6-1). By affecting fewer acres, the number of individual plants lost would be reduced; therefore, the direct impacts to reproduction and reestablishment would be decreased. Similarly, a reduction in the number of acres directly affected would decrease the potential for indirect impacts associated with invasive species, mechanical impact to soils, and alteration of community dynamics.

Alternative D

Construction impacts associated with Alternative D would initially affect approximately 269 to 282 acres (3%) of vegetation within the Proposed Project area. Post-construction reclamation would restore approximately 111 to 123 acres (41% to 44%) of this affected area. However, it should be noted that approximately ten percent to 20 percent of the temporarily disturbed sites could have shallow soils that would have a low probability of success restoration. The result would be a permanent impact to approximately 158 acres (1%) of the Proposed Project area.

Vegetation community types that would be directly affected from construction activities include: juniper; mountain mahogany; big, low, and mountain sagebrush; grasslands; and some riparian sites (Table 4.6-1). Agricultural land, aspen communities, and open water sites would not be affected by this alternative.

Under Alternative D, potential impacts to vegetation and special status plants species from construction activities would be less than those expected for Alternative B and Alternative C. Also, Alternative D would affect fewer total acres of vegetation when considering both temporary and permanent impacts (Table 4.6-1). By affecting fewer acres, the number of individual plants lost would be reduced; therefore, the direct impacts to reproduction and reestablishment would be decreased. Similarly, a reduction in the number of acres directly affected would decrease the potential for indirect impacts associated with invasive species, mechanical impact to soils, and alteration of community dynamics.

4.6.2 Wildlife

A detailed report on probable impacts of this Proposed Project is provided in the Proposed Project technical report for biological resource impacts (Sharp *et al.* 2005). There are no similar operating wind projects located on the common landforms (long, narrow ridge with cliffs), region (southeast Idaho), or within specific habitats (sagebrush and mountain mahogany) that exist on Cotterel Mountain. As a consequence, there is no specific case history available to use in predicting the impacts of this Proposed Project on wildlife. Thus, this impact analysis relies on the experience and data from other western wind plants and in some cases, midwestern wind plants. It should be noted that there are several wind power projects on private land that have recently received permits in Idaho and which could be under construction during the next few years. These may provide some insight into wildlife impacts but none are in habitat similar to that on Cotterel Mountain. Therefore, they will not be a factor in the analysis of potential wildlife impacts from this Proposed Project.

Ranking systems provide insight into species-specific population status (e.g. potential decline, population fragility, or potential for impacts) and will be used in this section to assist in describing the context and intensity of impacts to specific species from this Proposed Project. For example, suspected impacts to a BLM Type II Special Status Species would be more closely scrutinized than would those of a BLM Type V watch species because it is likely that the population of a watch species would be more stable.

Potential impacts to wildlife will be analyzed in terms of: (1) local populations, (2) surrounding area populations, and (3) landscape populations. Local impacts are those that are anticipated to result from the Proposed Project on-site. Surrounding area impacts are those that may affect connected or adjacent populations, migrations, habitat use, or “ripples” from the local effects. The surrounding area would be considered the Raft River-Cassia Creek and Marsh Creek watersheds. Landscape level effects are generally thought of as impacts to populations such as migratory birds, bats, or other migratory species. A landscape effect could include analysis of impacts to wildlife populations in other states.

Wildlife impacts for ranked species in the local, surrounding area and landscape, both direct and indirect as well as cumulative impacts will generally be discussed within the framework of the following effects: direct mortality, habitat loss, habitat avoidance (i.e. displacement), and habitat degradation.

Big Game

Big game species are an important natural resource in Idaho, and hunting is one of Idaho’s primary outdoor recreational activities. High quality, relatively undisturbed big game winter range is an important resource, especially those areas where human disturbance is low. The quantity and quality of winter range usually limits big game populations, so a reduction in the carrying capacity of winter range could result in permanently lowered populations. The quality of winter range is affected by the amount of human disturbance, which is in turn related to how easily people can access winter range habitat. Big game using the parts of Cotterel Mountain outside the vicinity of the access road to the radio tower site is typically accustomed to seclusion and low levels of human intrusion.

Alternative A (No Action)

The No Action Alternative would not adversely affect big game winter range on Cotterel Mountain.

Alternative B

Big game species potentially occurring on Cotterel Mountain (mule deer, bighorn sheep, and mountain lion) would experience direct habitat loss, and the indirect impacts of displacement from the vicinity of the site during both construction and operation of the Proposed Project. The acreages of impact to big game habitat presented below are for the amount of habitat actually disturbed by the Proposed Project; additional habitat adjacent to the actual disturbance may not be used by big game due to the presence of humans, equipment, and noise during construction and O&M activities.

Approximately 105 acres of mapped mule deer winter range, comprising two percent of the total mapped winter range within the Proposed Project area, would be permanently eliminated under Alternative B (Table 4.6-2). The loss of two percent of the total mule deer winter range within the Proposed Project area is not expected to affect the number of deer that can be supported during winter on Cotterel Mountain; therefore, impacts from the Proposed Project on mule deer winter range are expected to be low. Some habitat avoidance and habitat degradation would also be expected to occur.

Table 4.6-2. Potential Mapped Big Game Habitat Loss From the Proposed Project.

Alternative	Big Game Species Habitat Type		
	Mule Deer Winter Range (acres)	Bighorn Sheep Winter Range (acres)	Mountain Lion (acres)
Alternative B			
Permanent impact	105	194	203
Percent of total habitat	2%	2%	2%
Alternative C			
Permanent impact	62	162	203
Percent of total habitat	1%	1.5%	2%
Alternative D			
Permanent impact	58	115	158
Percent of total habitat	1%	1%	1.5%

The overall response of mule deer to the operating wind power project is difficult to predict. Radio telemetry studies have shown that mule deer avoided oil and gas exploration sites for distances of up to one mile in Wyoming (National Wind Coordinating Committee (NWCC) 2004). It is possible that some portion of the mule deer that use Cotterel Mountain would habituate to the presence of the operating project as well as to the increased traffic associated with maintenance of the Proposed Project. Some mule deer may not habituate to the presence of the Proposed Project and its associated activities and therefore would avoid the Proposed Project area. It would be anticipated that mule deer would use other winter range within the Raft River Valley drainage system. In addition, mule deer may avoid the Proposed Project area year round, thus losing not only winter range use, but potentially other seasonal use of the area. It is unknown if this displacement would adversely affect the behavior and fitness of these deer.

The Proposed Project, under Alternative B, has the potential to increase the number of visitors to Cotterel Mountain. Increased human activity would be expected to result in additional displacement of mule deer further from their Cotterel Mountain winter range. Improved road access available to hunters could result in increased harvest or poaching of deer. However, if human use increases following completion of the Proposed Project, then some displacement of mule deer from the area would be expected.

Alternative B would permanently eliminate a total of 115 acres of mapped bighorn sheep winter range, which is less than one percent of the total area of winter range within the Proposed Project area (10,877 acres). Although most of Cotterel Mountain is designated as bighorn sheep winter range (Idaho Department of Fish and Game (IDFG) 2003b), it is currently not used and therefore adverse impacts are not expected from Alternative B. However, it could be expected that bighorn sheep habitat on Cotterel Mountain would become unsuitable with the development of the Proposed Project and increased human use of the area, thus the potential for bighorn sheep use on Cotterel Mountain in the future would be lost.

The use of fencing within the Proposed Project area would be very limited. Chain link fences would be used to prevent big game, livestock, and people from entering the Proposed Project substations. Since individual wind towers would not be fenced, it is anticipated that big game movement through the Proposed Project area would not be curtailed or hindered.

Disturbance during and after construction would also have adverse impacts on mountain lions. Mountain lions, would likely initially avoid the area during project construction. Following construction mountain lions may habituate to the operating project to some degree depending on the level of public use of the area, and to any changes that may occur to mule deer distribution. Construction and O&M may change the patterns of mountain lion use and decrease prey availability on Cotterel Mountain.

Alternative C

The impacts of Alternative C to big game would be similar to those expected to occur under Alternative B, with slightly smaller areas of temporary impacts (Table 4.6-2).

Alternative D

The impacts to mapped mule deer winter range from Alternative D would be slightly less than Alternative B but would be about the same as Alternative C. Under Alternative D, no turbines would be constructed along the east ridgeline of Cotterel Mountain. Overall, there would be a reduced potential for disturbance to mule deer from construction activities and there would be no O&M activities along the east ridge area.

Impacts to mapped bighorn sheep winter range from Alternative D would be slightly less than Alternative B and Alternative C (Table 4.6-2). Under Alternative D, no turbines would be constructed along the east ridgeline of Cotterel Mountain. Overall, there would be reduced potential for disturbance to mapped bighorn sheep from construction activities and there would be no O&M activities along the east ridge area.

Impacts to mountain lions from Alternative D would be the similar to Alternative B. Under Alternative D, no turbines would be constructed along the east ridgeline of Cotterel Mountain. Overall, there would be reduced potential for disturbance to mountain lions from construction activities and there would be no O&M activities along the east ride area.

General Wildlife Habitat for Birds and Non-Game Mammals

Alternative A (No Action)

The No Action Alternative would not adversely affect wildlife habitat on Cotterel Mountain.

Alternative B

Non-game mammals and small birds would be affected by increased traffic and human presence on Cotterel Mountain, but primary effects would occur in direct proportion to the amount of potential habitat removed by Proposed Project construction. Alternative B would permanently eliminate about 200 acres, or two percent of the 11,500-acre Proposed Project area, and temporarily alter an additional 164 acres (1.4% of the Proposed Project area), which would be restored once construction is complete. It should be noted that restoration of shrub-steppe vegetation to a condition where it is again providing suitable habitat could take many years. Due to the added complication of soil compaction during construction of the Proposed Project, it could take up to 20 years or longer to restore temporarily altered habitat on Cotterel Mountain.

Under Alternative B, there would be loss of a portion of seasonal (winter and nesting) habitat for many different species such as small birds, small mammals and raptors. Based on the vegetation analysis, there is not expected to be a total loss of any single vegetation cover type or habitat found on

Cotterel Mountain. During construction, some areas would likely be avoided by those resident birds and mammals that are sensitive to human disturbance. Once construction is complete and disturbance levels decline, many of those species would be expected to reoccupy habitats near the facility. During operation, nesting passerines may avoid the area within a few hundred meters of the turbines (Leddy *et al.* 1999), but no species are expected to permanently disappear from Cotterel Mountain.
It has been shown that small birds may avoid the area surrounding the wind turbines, transmission interconnect lines, and roads of wind projects by up to 590 feet (NWCC 2004). Using this 590-feet potential avoidance zone from the Proposed Project features, the area of avoidance for passerines under Alternative B would be approximately 4,485 acres.

Alternative C

The impacts under Alternative C would be similar to, but slightly less than those of Alternative B in terms of the permanent and temporary disturbance footprints. The 180-meter avoidance zone under this alternative would affect approximately 3,700 acres.

Alternative D

The impacts under Alternative D would be similar to, but less than those of Alternative C, and much less than those of Alternative B, in terms of a 180-meter avoidance zone which would be approximately 3,120 acres. The temporary and permanent construction footprints of this alternative would also affect the fewest number of acres of the three action alternatives.

4.6.3 Amphibians and Reptiles

Alternative A (No Action)

Alternative A would not have an impact on amphibians and reptiles at Cotterel Mountain.

Alternative B

Impacts to local amphibian habitats would be expected to be low because the Proposed Project road construction generally would occur outside of the riparian habitat where amphibians would occur. Less than one percent of the riparian habitat would be impacted from road construction. Impacts to reptilian habitat would be expected to be moderate because the Proposed Project would generally occur within rocky areas, including blasting which could alter thermal attributes snake hibernation sites and potentially make them unusable or it could create additional snake hibernation sites. In addition, local mortality impacts are expected to be high because many reptiles are attracted to warm roads during the summer and thus are expected to experience higher fatality rates from vehicles.

Alternative C

Expected impacts to amphibians and reptiles would be similar to those of Alternative B.

Alternative D

Impacts to amphibians and reptiles would be similar to those of Alternative B and Alternative C, although the area of ground disturbance would be lowest under this alternative and it would likely have the least impact of the action alternatives on amphibians and reptiles.

4.6.4 Bat and Bird Fatalities from the Operations of the Proposed Wind Project

Wind power projects may have effects on wildlife, particularly avian species and bats, depending upon the location, geography, and natural setting of the Proposed Project. Long-term effectiveness monitoring of the Proposed Project (five years or greater) is key in understanding the relationships between the Proposed Project design, siting of the towers, and operation of the facility and effects on wildlife. These effects can occur in a variety of ways but based on data collected from other wind farms, are chiefly associated with occasional bird collisions with the large propellers that drive each of the wind turbines (referred to as the rotor swept area of each turbine).

Long-term monitoring is also necessary to determine how the characteristics of the Proposed Project and its turbines affect the behavior and migration of birds and bats and to determine if there are certain turbines along the string that are contributing to bird and bat mortality that would trigger the need to implement management actions to reduce these effects. The Applicant and BLM recognize that effectiveness monitoring results may require operational changes or adaptive management actions and will work cooperatively with the U.S. Fish and Wildlife Service (USFWS) and IDFG to develop adaptive management actions that will address wildlife mortality if it occurs. Adaptive management tools that are available to the Applicant and BLM include, but are not limited to: timing stipulations during construction, operational changes of turbines, siting considerations, lighting scenarios, and color schemes. These adaptive management tools are addressed in Appendix D.

Many existing wind power projects that have multiple strings of wind turbines stacked one behind another create a “gauntlet” for birds and bats. Mortality factors increase in these maze-like wind farm layouts where there can be multiple risks to birds and bats that attempt to navigate through them. Recent data at other wind energy sites across the country that have these layouts (including Altamont and Stateline) have identified “problem turbines” that often cause the majority of bird and bat mortalities.

The Proposed Project involves only one linear string of towers with the towers being approximately one-quarter mile apart. In addition, the proposed Cassia RMP amendment is specific to the Proposed Project only, and no other wind energy projects will be permitted on Cotterel Mountain. This will eliminate the possibility of the “gauntlet” effect on birds and bats in the future.

Understanding how a wind power generating facility function helps better understand the potential effects to resources and other public use of the area and aids in developing responsive management strategies to avoid, reduce and mitigate these effects wherever possible along the turbine string.

The Proposed Project is projected to operate at 0.35 (35%) capacity factor under optimum wind conditions. This means that the Proposed Project generates 0.35 (35%) of its total nameplate capacity over time because the wind does not always blow at a speed high enough to turn the blades of the turbines and generate electricity; and at times it blows so fast, i.e., during storms, that the blades are feathered or braked (stopped).

This is not to say that all of the turbines in a project are running 35 percent of the time or that they all are not running 65 percent of the time. Each turbine functions independently of each other. The turbine blades begin to turn when the wind reaches speeds of approximately eight to nine miles per hour or greater. When wind speeds exceed approximately 55 miles per hour, the blades are feathered and turned out of the wind.

Naturally, wind speeds are variable along the length of a mountain ridge. As you move along a 12 to 14 mile turbine string, as is proposed on Cotterel Mountain, each turbine turns independently of the others according to the wind speed at its location. The observer will normally see that some turbines are turning and others are not turning at any given time. Rarely would all the turbines be either turning or not turning at the same time. Each turbine operates as a single entity; some may generate 45 percent of the time and others only 25 percent of the time because of their location on the mountain (it is only the overall Proposed Project average that is 35%). In summary, it is difficult to predict at what time and how long any one turbine would be turning. There is, however a general difference between diurnal and nocturnal wind patterns.

Migratory Bats

Most studies have shown that the majority of bat mortalities at wind plants are long-distance migratory tree and foliage roosting species, such as the hoary bat, little brown myotis, and silver-haired bat. Of these species, the hoary bat has a higher wind turbine impact mortality rate than all other species in the west (Erickson *et al*. 2002; Gruver 2002). The data also show that mortality is almost nonexistent during the breeding season and generally occurs during migration and dispersal in late summer between July and September (Johnson *et al.* 2002; Gruver 2002). The same studies also showed that mortality rates were higher during fall migration than spring. This was attributed to a lower migration concentration because females leave earlier than males in the spring, but not in the fall (Gruver 2002). Studies also indicate that bats follow large migrations of moths during the fall months. Further, it is well documented that these same species have a history of impact mortality with transmission interconnect lines, television and communication towers, and even lighthouses (Erickson *et al*. 2002).

The evidence also shows that resident bats, which are foraging or commuting between roosts, do not make up the bulk of collision mortality (Crawford and Baker 1981; Johnson *et al*. 2000b). This is based on impact distribution data among turbines and observed forage habitat characteristics. Since resident bats would have a defined flight corridor between roosts, they should exhibit higher densities of fatalities in these corridors, but in a majority of the cases that were studied, there are no patterns; rather, there are no areas of appreciably higher densities in the distribution of fatalities (Erickson *et al*. 2002; Johnson *et al*. 2000a).

In addition to flight corridor data, evidence from foraging behavior demonstrates that it is unlikely that fatalities would occur in resident bat populations rather than migrating ones (Erickson *et al*. 2000). Normally, bats do not forage at heights associated with turbine activity or in areas associated with wind-turbine projects, since these areas generally are very flat and windy and have reduced insect populations. Rather, they are normally associated with less wind and more water (Johnson *et al*. 2002).

Migratory bat species may be more likely to be involved with collision mortality events because they fly higher in the air and in denser clusters when migrating (Harvey *et al*. 1999). This not only puts the bats at a height associated with the turbine impact zone, but because they migrate in groups, their ability to use echolocation is affected (Griffin 1970). Evidence also shows that fatality events during migration may be dependent on the surrounding habitat. Studies done at Foote Creek Rim (Wyoming) and Buffalo Ridge (Minnesota) wind plants have shown an inverse relationship between the number of turbine mortalities and the distance to the nearest woodland habitat (Erickson *et al*. 2002; Johnson *et al.* 2000b). There are woodlands (juniper and mountain mahogany) in the immediate vicinity of some of the proposed turbines. The same studies also showed that turbines with lights mounted on or near the turbines did not cause appreciably higher numbers of fatalities.

Based on the available information, larger, less maneuverable, migrating species are primarily associated with wind turbine mortality events. In addition, those species, most notably hoary and silver haired bats in the western U.S., migrating in large colonies in late fall, make up the majority of fatalities observed and recorded (Erickson *et al*. 2002; Johnson *et al*. 2000a). Although there have been limited quantifiable data about wind turbine/bat collision effects on bat populations, qualitative and circumstantial data suggest that turbine mortalities do not appreciably contribute to population declines (Erickson *et al*. 2002), at least in the west.

Resident Bats

Cotterel Mountain has three known bat species (western small-footed myotis, long-eared myotis, and pallid bat) that may be affected by disturbances from construction or impact caused mortality from turbines. Other bat species may occur, but have not yet been identified. If bat hibernacula or nursery colonies are present in the cliffs and rock outcrops along Cotterel Mountain, blasting and/or drilling during construction could disturb bats and cause temporary or permanent abandonment of these areas during the hibernating or nursery season.

<u>Alternative A (No Action)</u>

Alternative A would not adversely affect resident bats on Cotterel Mountain.

<u>Alternative B</u>

The construction of turbine foundations and roads would directly affect only about one acre of rock outcrop within the Proposed Project area. However, noise and percussion from blasting, drilling, digging, and movement of large vehicles could affect roosting, breeding, or hibernating bat species. Once construction is complete and disturbance levels decline, displaced bat species would be expected to reoccupy roosting habitats near the facility. Therefore, the primary potential impact to bat species from the Proposed Project would be to those species attempting to rear young and hibernate within rock outcrops near the construction sites both from potential displacement and potential impact mortality due to turbine proximity to cliff areas.

Of the three species of bat known to occur on Cotterel Mountain, the western small-footed myotis is the only species that hibernates winter-long (one of the last species to start) and uses rock outcrops and caves as primary roosting, breeding, and hibernating habitat. Construction activity from late May or June through early July could displace hibernating or breeding western small-footed myotis and lead to increased offspring mortality.

The long-eared myotis is normally found near open water and roosts/hibernates in trees (IDFG 2002). Pallid bats are also found near open water, and generally do not hibernate. Both of these species are less likely to be affected adversely by Proposed Project construction.

No turbine impact caused mortality has been recorded for western small-footed myotis, long eared myotis, and pallid bat at any other wind plant. Therefore, impacts from operation of the Proposed Project should be low to these species.

<u>Alternative C</u>

Impacts would be similar to that of Alternative B, but to a lesser extent.

<u>Alternative D</u>

Impacts would be similar to that of Alternative B and Alternative C, but would be the smallest of the three action alternatives.

Birds

Passerines are the most frequent fatality recorded at wind plants and often comprise more than 80 percent of the fatalities recorded in modern wind plants in the west (Erickson *et al.* 2001b). The degree of collision risk to birds at wind plants appears to be species-specific, based on the results of fatality monitoring at other wind plants throughout the west. For example, fatalities of ravens, turkey vultures, and ferruginous hawks are rare, while fatalities of American kestrels, red-tailed hawks, and horned larks are more common. The siting of a wind power project in specific types of habitat and the behavior of an individual species plays a large role in its risk of collision.

Flight heights recorded in the field during point counts and diurnal fall migration surveys were analyzed to produce risk indices for each species and combined to produce overall indices for each group, although it must be recognized that there is variability within each group. Avian risk indices were calculated by turbine type for the avian and fall migration studies. Risk was calculated by multiplying use, expressed as the average number of birds of that group observed per plot survey, by the proportion of those birds that were observed flying, by the proportion of those flying birds that flew within the rotor swept area of that turbine. The risk indices for each group are therefore the average number of flying birds observed, per plot survey that flew within the rotor swept area of that turbine type.

Vertical risk indices were calculated from point count and diurnal fall migration data by multiplying percentages flying within the vertical rotor-swept area (RSA) by use. These risk indices varied among species, and were fairly similar among turbine types (Proposed Project technical report for biological resource impacts; Sharp *et al.* 2005). The vertical risk estimates for individual species varied from zero for sage-grouse, chukar, and pinyon jay to higher levels in the 0.2 to 0.8 range for the red-tailed hawk, turkey vulture, northern harrier, and a high of 0.6 to 3.8 for the common raven during point counts and diurnal fall migration, respectively. The American kestrel risk was in the lower range around 0.05 during the year long point counts and in the higher 0.1 to 0.2 range during the fall migration surveys, presumably because migrating birds flew higher than resident, hunting birds. The common raven, red-tailed hawk, turkey vulture, northern harrier, and American kestrel were the five species with the highest risk indices based on data from both the yearlong point counts and the fall migration surveys. Among passerines, swallows, unknown passerines, pine siskins, mountain bluebirds, and gray-crowned rosy finches had the highest risk indices. Tables 4.6-3 and 4.6-4 provide summaries of the risk indices by group, from the yearlong point counts and fall migration surveys, respectively. Risk indices by species are presented in the Proposed Project technical report for biological resource impacts (Sharp *et al.* 2005).

Table 4.6-3. Vertical Risk Indices by Avian Group and Turbine Type Based on Yearlong Point Counts.

Avian Group	Vertical Risk Indices by Turbine Diameter Type and Group					Overall Use
	70-meter	77-meter	80-meter	92-meter	100-meter	
Corvids	0.51	0.48	0.60	0.55	0.60	0.830
Doves	0.05	0.03	0.05	0.04	0.05	0.103
Gulls	0.07	0.07	0.07	0.07	0.07	0.101
Others	0.04	0.02	0.04	0.03	0.04	0.145
Passerines	2.654	1.86	2.70	2.56	2.70	5.857
Raptors	0.82	0.92	1.02	0.97	1.02	1.347
Upland game birds	0.04	0.00	0.04	0.00	0.04	0.105

These risk calculations, however, do not account for the obvious fact that the majority of birds must see turbines and avoid them, since birds are always present at wind plants in varying numbers, and the number of fatalities recorded is small, estimated to range between zero and four birds per turbine per year in the west. For example, a comparison of spring radar data and nighttime fatality estimates at the Stateline (Washington/Oregon), Buffalo Ridge (Minnesota), and Nine Canyon (Washington) wind plants indicated that between less than 0.01 percent to 0.08 percent of the targets passing through the area resulted in fatalities (NWCC 2004).

Table 4.6-4. Vertical Risk Indices by Avian Group and Turbine Type Based on Fall Migration Surveys.

Avian Group	Vertical Risk Indices by Turbine Diameter Type and Group					Overall Use
	70-meter	77-meter	80-meter	92-meter	100-meter	
Corvids	3.49	3.35	3.86	3.71	3.86	5.345
Doves	0.57	0.27	0.57	0.27	0.57	0.685
Others	0.02	0.02	0.02	0.02	0.02	0.025
Passerines	1.20	1.01	1.23	1.11	1.23	2.020
Raptors	1.81	1.82	2.27	2.07	2.29	3.398
Upland game birds	0.00	0.00	0.00	0.00	0.00	0.123

Avian Risk Indices were calculated by turbine for all birds observed flying in the avian and fall migration studies. The overall use in these tables is the average number of birds of that group observed per plot survey. Vertical Risk was found using the formula:

Vertical Risk = Use * Proportion of Birds Flying * Proportion of Birds Flying in the RSA

Flight direction patterns mapped on Cotterel Mountain showed that large birds moved predominantly southward during the fall, based on point count and fall migration survey data (TBR 2004). Flight directions during the spring, and of small birds, however, did not show such strong trends. The point count flight path maps showed that a fairly large proportion of raptor flight paths were parallel to and offset from the ridgetop where the turbines are proposed. The fall migration data showed some species-specific tendencies in terms of flight paths. Sharp-shinned hawks and Cooper's hawks tended to be to one side or the other of the ridgetop, and American kestrel flight paths were often to the west of the ridgetop. The flight paths of other species appeared to be somewhat uniformly distributed over the Proposed Project area.

The aerial raptor nest surveys documented an average of 0.32 active large raptor nests per square mile (mi^2) in the 68-square-mile raptor nesting survey area (excluding ravens and ground nesters such as northern harrier). The raptor nesting density in the raptor nesting survey area at Cotterel Mountain is slightly higher than raptor nesting densities recorded for other wind projects located in Colorado, Oregon, Washington, and Wyoming. These other wind projects reported nest densities ranging from 0.03 to 0.30 nests per mi^2, with a median density of 0.16 nests per mi^2 (n = 28) (Erickson *et al.* 2001b). This higher nesting density for raptors at Cotterel Mountain is attributed to the differences in habitat and topographic features between Cotterel Mountain and these other wind projects. Cotterel Mountain habitat is comprised of forested juniper and mountain mahogany with an abundance of cliffs. Habitat within the other projects was predominantly dry, open grassland and active, dry agriculture where the scarcity of trees and cliffs present raptors with few suitable nesting opportunities. Table 4.6-5 lists the comparative raptor nesting survey data. Potential raptor fatalities are of concern at the Projected Project area, because both the nesting density of 0.32 active nests per mi^2 and rates of use (1.3 raptors per 20-minute survey) are relatively high, compared to that at other western wind plant sites (Sharp *et al.* 2005).

Table 4.6-5. Raptor Nesting Density Comparisons.

Project	Project Site	Habitats	Year	Nest Sites	Density Comparison (nests/mi^2)	Comments
Cotterel, ID	Cotterel, ID	Sagebrush and native grasses, juniper and mountain mahogany, some aspen, cliff faces	2003	22	0.32	All active and probably active nests, excluding ravens and ground nesting species such as harriers, and including turkey vultures
Condon, OR	Condon, OR	Primarily dry agriculture, shrub-steppe, and grasslands; scarce upland trees; rare riparian habitats; a few very small wetlands and residential areas.	2000	19	0.04	Raptors and ravens (no ground species)
			2000	13	0.03	Raptors (no ground species)
Kenetech and CARES Wind Farm, OR/WA	Kenetech and CARES Wind Farm, OR/WA	Rangeland, shrub-steppe, rounded loess hills, basalt outcropping and cliffs, some riparian habitat, some cropland and woodland, "natural landscape"	1994	16	0.30	Hawk, owls, eagles
Maiden Wind Farm, WA	Maiden Wind Farm, WA	Grassland/shrub-steppe, dryland agriculture (wheat), CRP pastures, "natural landscape"	2001	55	0.23	Active raptor and raven nests (did not include ground dwelling species (northern harriers, short-eared owls, and burrowing owls)
			2001	38	0.16	Only active raptor nests (not including ground species)
Ponnequin Wind Energy, CO	Ponnequin Wind Energy, CO	Gently rolling, short/mid grass prairie	1997	27	0.16	Raptor nests includes unknown species
			1998	16	0.10	Active raptor nests, includes unknown species

Table 4.6-5. Raptor Nesting Density Comparisons.

Project	Project Site	Habitats	Year	Nest Sites	Density Comparison (nests/mi^2)	Comments
Seawest Windpower Project, WY	Foote Creek Rim	Natural landscape	1995	56	0.15	Active raptor nests
			1997	83	0.22	
			1998	70	0.18	
			1999	70	0.18	
	Simpson Ridge		1995	87	0.16	
			1997	96	0.17	
			1998	97	0.18	
			1999	93	0.17	
	Morton Pass Reference		1995	40	0.07	
			1997	37	0.07	
			1998	49	0.09	
			1999	48	0.09	
The Stateline Project OR/WA	Wind Resource Area	Grazed shrub-steppe, CRP seeded pastures, cultivated wheat fields	1995	8	0.10	Active nests, hawks and owls
			2000	16 to 18	0.20 to 0.23	Active nests, hawks, owls, unknown raptor, unknown large birds
	WRA (blue)		2000	11	0.14	Active nests, no unidentified birds, nor burrowing owls
	Reference Area		1995	13	0.15	Active nests, hawks, unknown raptors, owls
TPC Oregon Wind Power Development	Oregon	Non-irrigated agriculture, wheat and cattle grazing,	2001	50	0.24	Active nests, buteos, falcons, owls

Table 4.6-5. Raptor Nesting Density Comparisons.

Project	Project Site	Habitats	Year	Nest Sites	Density Comparison (nests/mi^2)	Comments
Stateline, OR	---	"agricultural landscape"	2001	19	0.213	Raptors (buteos, eagles, great horned owl), no ground species (northern harriers, short-eared owls, burrowing owls)
Klondike, OR	----	"agricultural landscape"	2001	3	0.060	
Nine Canyon, WA	----	"agricultural landscape"	2001	4	0.158	
Zintel Canyon, WA	----	"agricultural landscape"	2001	4	0.033	
Buffalo Ridge, MN	----	Agricultural crops (corn, soybeans, grains, hay,) and Conservation Reserve Program fields (grasslands), small areas of woodlots and wetlands, "agricultural landscape"	Unknown	Unknown	0.153	
Nest Densities as Reported by West, Inc. (Erickson *et al.* 2001a) Raptors only, excludes inconspicuous ground species						

Nesting Raptors

Alternative A (No Action)

Alternative A would not result in any impacts on raptor populations.

Alternative B

The impact of Alternative B on nesting raptors would depend on a number of factors including the construction methods used, the proximity of the construction to the nest, the noise level, and whether the construction activity is visible to the birds in the nest. Blasting during the nesting season would have the highest likelihood of causing abandonment of raptor nests. Resident hunting raptors may avoid the vicinity of the turbines and in combination with the habitat lost to construction have a slightly smaller prey base available within their territories. This reduction could affect the productivity or survival of individual pairs of birds. Golden eagles and prairie falcons nest among the cliffs very near the Proposed Project. Construction and Proposed Project operations would be precluded within a one-quarter mile circle around a known golden eagle nest location.

Alternative C

The impacts of Alternative C would be similar to that of Alternative B.

Alternative D

The impacts of Alternative D would be very similar to that of Alternative B and Alternative C. Under Alternative D, there would be fewer turbines constructed. There would be no turbines constructed along the east ridge of Cotterel Mountain. This would result in reduced potential impacts to nesting raptors along the east ridgeline area. The two golden eagle nests located at the north and south end of the east Cotterel Mountain ridgeline would be avoided. Overall, there would be a reduced potential for disturbance to nesting raptors from construction activities and there would be no O&M activities in this area.

Waterfowl, Shorebirds, and Waders

This group of species is not expected to be measurably affected by any of the Proposed Project alternatives, because no suitable habitat is present at Cotterel Mountain for birds in this group, and only a very few migrants were observed during on-site avian surveys (TBR 2004). There would be the potential for migrating individuals from this group to occasionally pass through the Proposed Project area. However, this would be expected to be rare and would not be expected to result in a measurable affect on any local or regional population of this group of species.

Passerines and Other Small Birds

Radar Data

The radar study conducted during the fall of 2003 (ABR 2004; TBR 2004) indicates that fall nocturnal migration passage rates at Cotterel Mountain are similar to two other locations studied (i.e., at the Stateline and Vansycle wind-energy sites in eastern Oregon; Mabee and Cooper 2002). Flight altitudes were also similar between these sites. Overall, only 3.3 percent of nocturnal targets flew at or below 125 meters above ground level during the fall radar study. Risk of fatality in nocturnal migrants is predicted to be similar to the mortality rates at Stateline and Vansycle, although a direct comparison cannot be made, as the data from Stateline and Vansycle were collected at a different time and included spring migrants. Further, turbine heights at the Stateline and Vansycle projects are lower than the proposed turbines at the Proposed Project. The passage rates and elevations indicate that the fatality rates for nocturnal migrants would be expected to be similar to rates from eastern Oregon and Washington.

There are no existing wind projects on the same type of landform, region, and habitat at Cotterel Mountain. As a consequence, there is no case history available to use in predicting the impacts of this Proposed Project on wildlife. Some new wind plants in other regions of the U.S. have experienced higher fatality rates of raptors and bats than those in Minnesota, Wyoming, Oregon, and Washington. Considering this new information, the fatality rates for bats and/or birds at this Proposed Project may be higher than predicted rates based solely on the Minnesota, Wyoming, Oregon, and Washington rates.

Alternative A (No Action)

Alternative A would not adversely affect birds or bats on Cotterel Mountain.

Alternative B

Table 4.6-6 provides a summary of the estimated ranges of annual fatalities for birds and bats at the Proposed Project, based on the fatality searches conducted in Minnesota, Wyoming, Oregon, and Washington wind plants. The estimated annual fatality range calculations were made three ways: per turbine, per 3000 square meters of RSA, and per MW. These three ranges were used based on the findings of the wildlife working group of the NWCC. This group is comprised of professional biologists conducting post-construction monitoring studies of wind plants. These professionals agree that it was prudent to use three estimates, given the large variation in turbine sizes currently in operation. Relatively few rigorous, standardized carcass searches, which also account for birds missed by the surveyors or removed by scavengers have been conducted, and therefore the range of estimated fatalities that result from these studies is large. This is typical of studies that attempt to obtain a sufficiently large sample of rare events.

Considering data from other projects, it is estimated that annual raptor mortality for Alternative B may range from zero to 63 birds. The estimated number of all bird fatalities may range from zero to 934 per year. The estimated number of bat fatalities may range from zero to 667 per year (Table 4.6-6). In all three cases, the range differs according to the basis of the prediction (number per turbine per year, number per 3000 square meters of RSA, or number per MW).

Additional fatalities may also occur from collisions with overhead electric transmission interconnect lines, although such collisions are expected to be rare. Alternative B is likely to have the lowest mortality from transmission interconnect lines since it includes only nine miles of new transmission interconnect line. Fatalities would be most likely to occur during conditions of low visibility, or if transmission interconnect lines were located in areas where birds regularly flew between destinations, such as between foraging and nesting areas, or between attractive patches of habitat (bird movement patterns).

Table 4.6-6. Estimated Annual Fatality Ranges, by Alternative, for Birds and Bats at the Proposed Project.

Group and Basis for Estimate	Annual Fatality Range Used for Estimate*		Alternative B	Alternative C		Alternative D	
	Low	High	70 meter	77 meter	100 meter	77 meter	100 meter
Raptors							
Per turbine	0	0.036	0 to 5	0 to 4	0 to 3	0 to 3	0 to 2
Per 3000 sq meters of RSA	0	0.38	0 to 63	0 to 58	0 to 81	0 to 48	0 to 66
Per MW	0	0.265	0 to 52	0 to 39	0 to 64	0 to 33	0 to 52
All birds including raptors							
Per turbine	0	2.8	0 to 364	0 to 274	0 to 227	0 to 230	0 to 185
Per 3000 sq meters of RSA	1.1	5.6	183 to 934	167 to 852	233 to 1188	140 to 713	190 to 968
Per MW	0.9	2.8	176 to 546	132 to 412	219 to 680	111 to 344	178 to 554
Bats							
Per turbine	0	3.2	0 to 416	0 to 314	0 to 259	0 to 262	0 to 211
Per 3000 sq meters of RSA	1	4	167 to 667	152 to 608	212 to 848	127 to 509	173 to 691
Per MW	0.8	3.3	156 to 644	118 to 485	194 to 802	98 to 406	158 to 653
Features of the alternatives							
Number of turbines			130	98	81	82	66
Rotor diameter (meters)			70	77	100	77	100
Total RSA (sq meters)			500,300	456,350	636,174	381,844	518,364
MW per turbine			1.5	1.5	3	1.5	3
Total MW			195	147	243	123	198

Based on data from Erickson *et al.* (2001b).

Alternative C

The impacts of the 147 MW variation of Alternative C would be slightly less than but similar to those of Alternative B. The impacts of the 243 MW variation of Alternative C would be higher (Table 4.6-6). It is estimated that annual raptor mortality at the Proposed Project may range from zero to 58 birds for the 147 MW variation of Alternative C, or zero to 81 birds for the 243 MW variation, based on fatality and use rates from other western wind power projects (Table 4.6-6). The estimated number of bird fatalities for the 147 MW variation of Alternative C is from zero to 852 per year, depending on whether the basis of the prediction was number per turbine per year, number per 3000 square meters of RSA, or number per MW. Bat fatalities are estimated to range from zero to 608 for the 147 MW variation of this alternative, and 57 to 848 per year for the 243 MW variation. The estimated number of fatalities varies, depending on the basis of the prediction: number per turbine per year; number per 3000 square meters of RSA; or number per MW (Table 4.6-6). Fatalities resulting from collisions with overhead electric transmission interconnect lines may be higher than under Alternative B, due to the 19.7 miles of new transmission interconnect line, although this would also be related to the location of the transmission interconnect line in relation to bird movement patterns.

Alternative D

The 123 MW variation of Alternative D would probably cause the lowest number of fatalities of raptors, all birds, and bats, since it has the lowest number of turbines, RSA, and MW. This version of Alternative D is estimated to cause zero to 39 raptor fatalities, zero to 574 all bird fatalities, and zero to 410 bat fatalities per year. Conversely, the 198 MW version of Alternative D is estimated to cause fatality rates very similar to that of the 243 MW version of Alternative C (Table 4.6-6). Fatalities from collisions with transmission interconnect lines would be the same as those under Alternative C because there would also be 19.7 miles of new transmission interconnect line.

4.6.5 Special Status Wildlife Species

Threatened and Endangered Species

Alternative A (No Action)

Alternative A would not impact either of the listed species, gray wolf or bald eagle. This alternative would also not have an impact on sensitive species.

Alternative B

The gray wolf (Threatened, nonessential population) and bald eagle (Threatened) are the only two listed species with potential to occur on Cotterel Mountain and which could be affected by the Proposed Project. Only two bald eagles were observed during the baseline study in the fall of 2003. Wolves or their signs were not observed during the baseline study, and there are no records of wolves on Cotterel Mountain or south of the Snake River. A complete analysis of Proposed Project impacts to bald eagle and gray wolf will be detailed in a biological assessment which is currently under preparation.

Bald eagles appear to be rare migrants through the Cotterel Mountain area, based on the limited observations made during the baseline study. The habitat is not optimal for eagles due to the lack of large trees needed for perching, nesting and roosting. Mortality or injury is the primary potential impact to bald eagles from the Proposed Project. Mortality could occur from both electrocution and collisions with transmission interconnect lines and turbines blades. Bald eagle mortality from electrocution is not expected to occur because overhead transmission interconnect lines would be designed to discourage raptor perching and the distance between wires would be great enough to prevent eagles from touching two wires at once. In addition, electrical facilities at the two substations would be designed in such a way as to decrease the possibility of bird electrocution.

The potential for bald eagles to be killed by the Proposed Project is unlikely, however, the potential does exist and cannot be discounted. Therefore, the potential for a “take” of a bald eagle(s) must be considered a possibility if the ROW for the Proposed Project is granted. As a result, the Proposed Project would require formal consultation under Section 7 of the Endangered Species Act (ESA) of 1973, as amended. A result of that consultation would be a Biological Opinion issued by the USFWS. Take can be authorized in the Incidental Take Statement of the Biological Opinion after the anticipated extent and amount of take has been described, and the effects of the take are analyzed with respect to jeopardizing the species or adversely modifying critical habitat. The Biological Opinion would also specify reasonable and prudent measures and conservation recommendations to minimize impacts on the bald eagle.

According to available information from the BLM and the IDFG, gray wolves are not known to occur on Cotterel Mountain. Since the reintroduction of the gray wolf to central Idaho in 1996, this species has increased its range and population substantially. During the life of the Proposed Project, it is possible that this species could return to Cassia County and inhabit Cotterel Mountain. If wolves did return, they would be anticipated to avoid human activity and would not likely be affected by the operation of the Proposed Project.

Alternative C

The effects of Alternative C would be similar to those of Alternative B, and are not likely to adversely affect either bald eagles or gray wolves.

Alternative D

The effects of Alternative D would be similar to those of Alternative B and Alternative C, and are not likely to adversely affect either bald eagles or gray wolves.

Special Status Species

Small Mammals

Alternative A (No Action)

Alternative A would not have an impact on any sensitive species.

Alternative B

Under Alternative B, the overall impacts to cliff chipmunk populations would likely be low due to the scattered distribution and extent of potential disturbance. During construction, some areas would likely be avoided or abandoned, but once construction is complete and disturbance levels decline, cliff chipmunks would be expected to reoccupy habitats near the facility. The potential absence of predators due to Proposed Project construction may benefit cliff chipmunk populations.

Alternative C

The impacts of Alternative C to special status species would be similar to those expected to occur under Alternative B, with slightly smaller areas of permanent and temporary impacts from Proposed Project construction and fewer turbines.

Alternative D

The impacts of Alternative D to special status species would be similar to those expected to occur under Alternative B and Alternative C, with slightly smaller areas of permanent and temporary impacts from Proposed Project construction.

Birds

Alternative A (No Action)

Alternative A would not have an impact on any sensitive species.

Alternative B

The impact from Alternative B on special status bird species would be dependent on the species and their associated habitat. Cassin's finch, golden eagle, Brewer's sparrow, prairie falcon, pinyon jay, sage thrasher, northern goshawk, ferruginous hawk, loggerhead shrike, peregrine falcon, plumbeous vireo and green-tailed towhee were all observed within the Proposed Project area during the avian surveys; therefore they are likely to occur within the Proposed Project area during construction and operation.

Nesting and non-breeding golden eagles could be adversely affected not only by construction disturbance, but also from collisions with turbines. Golden eagle fatalities have been recorded at other western wind plants, including the Altamont Pass and Montezuma Hills areas of California. The Altamont Pass eagle population has been studied for many years (Hunt 2002), and it is not clear whether the 40 to 60 golden eagles killed there per year is having an adverse effect on local eagle populations. The eagles killed at Altamont were non-breeding adults and subadults termed "floaters." These are birds that are look for territories to occupy and nest in. The nesting population of eagles within 30 kilometers of Altamont has not declined, but the floater population may have declined and floaters are not being produced within this population; therefore, the only source of floaters would be from immigration from other areas (Hunt 2002).

Based on the point count and fall migration survey data, 53 to 70 percent of golden eagles observed flying were within the RSA, depending on turbine type. This indicates that golden eagles could be at relatively high risk of being killed by turbines. Golden eagle use at Cotterel Mountain is approximately four times lower than at the High Winds project. Golden eagle use at Cotterel Mountain is 0.068 birds per 20-minute survey, while it is 0.287 birds at the High Winds project site in the Montezuma Hills in California (Kerlinger *et al.* 2001). One golden eagle fatality was recorded during the first year of monitoring at the High Winds project (Kerlinger *et al.* 2005), which consists of 90, 1.8-MW wind turbines with 80-meter rotor diameters. The High Winds project is used for this comparison because the type and number of turbines at the High Winds project are representative of what would be constructed for the Proposed Project and those at Altamont Pass are not. The approximate rate of expected golden eagle fatalities at the Proposed Project area could be one bird every four years.

Columbian sharp-tailed grouse, long-billed curlew, northern pygmy-owl, and western burrowing owl have historically been observed within the Proposed Project area, but were not observed during the avian survey; therefore, they are not considered likely to occur within the Proposed Project area during the construction phase. Based on the rarity of occurrence of these species and the limited amount of disturbance that would occur within their possible habitat types, it is unlikely that Proposed Project construction would affect these species.

Although there is potential habitat within the Proposed Project area for the flammulated owl, sage sparrow, grasshopper sparrow, red-naped sapsucker, Virginia's warbler, and calliope hummingbird, there are no recorded observations of individuals or nest sites within the Proposed Project area. It is unlikely that Proposed Project construction would affect these species.

There is no suitable habitat present within the Proposed Project area for American white pelican or black tern. Based on the low number of historic observations and lack of habitat, these species are not likely to occur within the Proposed Project area, and would not be impacted by Proposed Project construction. However, both species nest on the Minidoka National Wildlife Refuge and may use the flight space over Cotterel Mountain during feeding or migration flights.

Alternative C

The impacts of Alternative C to special status species would be similar to those expected to occur under Alternative B, with slightly smaller areas of permanent and temporary impacts from Proposed Project construction and fewer turbines. The fatality risk from the turbines, however, may not be less if the total RSA is as high as Alternative B.

Alternative D

The impacts of Alternative D to special status species would be similar to those expected to occur under Alternative B and Alternative C, with slightly smaller areas of permanent and temporary impacts. The fatality risk from the turbines would likely be less because the total RSA would be lower than Alternative B and Alternative C.

Greater sage-grouse

There is incomplete and unavailable information regarding the affects of the Proposed Project on sage-grouse. Because there are currently no wind power facilities in operation close to occupied sage-grouse leks, nesting, rearing, or wintering habitat, there is no case history on which to base impact predictions. As a consequence, this impact assessment is based on case histories of the impacts of new roads and transmission interconnect lines, as well as similar elements (e.g. other types of tall structures). This assessment is conservative because the opinions of experts and the results of research and anecdotal information on the effects of energy developments to sage-grouse are wide ranging and sometimes conflicting. The effects of the Proposed Project are unknown and could range from the extremes of temporary avoidance to extirpation of the local population and loss of use of winter habitat during severe winters by sage-grouse from other areas.

Impacts of energy development in general, and wind-power generation developments in particular, on sage-grouse are not well known (Braun *et al.* 2002; Manes *et al.* 2003; Connelly 2003). Although scientists, conservationists, engineers, and developers speculate on the impacts, rigorous scientific study, which quantifies and demonstrates cause-effect relationships is mostly lacking. For example, the analysis of cause-effect relationships between land uses and population responses was the third highest among the eight key research needs identified for sage-grouse in Oregon (Rowland and Wisdom 2002).

The primary reason for the nationwide decline in sage-grouse is habitat related, including, habitat loss, habitat fragmentation, and habitat degradation (Connelly *et al*. 2004). It is reasonable to assume any similar changes to sage-grouse habitat on Cotterel Mountain resulting from the development of Proposed Project would, on a smaller scale, also affect sage-grouse using the surrounding area such as Conner Ridge and Jim Sage Mountain. Whether such effects are measurable is unknown.

Perhaps the single most unknown factor is how sage-grouse, which are accustomed to a relatively low vegetation canopy, would respond to numerous wind turbines hundreds of meters taller than the surrounding landscape. Some scientists speculate such a skyline may displace sage-grouse hundreds of meters or even miles from their normal range (Manes *et al*. 2002; Flake 2003; Connelly 2003; NWCC 2004). If birds are displaced, it is unknown whether, in time, local populations may become acclimated to elevated structures and return to the area.

A second unknown is how sage-grouse would respond to increased human activity. Certain construction activities would be disruptive, and birds are likely to avoid the immediate vicinity during construction. How post-construction activities associated with O&M would affect grouse is also unknown. It is possible birds would become accustomed to routine activities and may return to the area. Historically small numbers of sage-grouse have used the irrigated lawns at the Central Facilities Area on the Idaho National Engineering and Environmental Laboratory, even though Central Facilities Area has over 50 buildings, 2,000 personnel, and vehicle traffic (Connelly *et al*. 2003).

The sage-grouse inhabiting Cotterel Mountain are using the local habitat that already includes a gravel access road with intermittent traffic, and a cluster of tall communication towers on the mountain summit. The lek closest to this cluster of towers is 0.62 mile away, and the towers are visible from that lek. One observation made by TREC, Inc. staff during the spring of 2004 indicates that at least some of the sage-grouse are somewhat accustomed to being much closer to some tall structures. Several males were observed displaying directly beneath a meteorological tower located within several hundred meters of an active lek. These meteorological and communication towers, however, are very different from a wind turbine, which would be much larger and have parts in motion.

The direct loss and fragmentation of habitat associated with noise disturbances from vehicle traffic and construction have been shown to reduce attendance at sage-grouse lek sites and lower female nest initiation in proximity to these sites. According to one study that specifically addressed noise impacts on sage-grouse leking sites, noise disturbances within 660 feet of a lek site generally resulted in a loss of attendance. As the distance increased from the source of noise, the number of leks with reduced attendance decreased (Braun *et al.* 2002). Similarly, female sage-grouse were found to move greater distances from leks near noise disturbances, and had lower rates of nest initiation in areas disturbed by vehicle traffic (Lyon and Anderson 2003). Therefore, sage-grouse leks located within 660 feet of wind turbines and Proposed Project roads could experience reduced attendance as a result of noise generated from the Proposed Project features. Likewise, suitable nesting habitat located within 660 feet of the Proposed Project roads and turbines could be made unavailable to sage-grouse due to avoidance as a result of Proposed Project generated noise.

Following is a summary of some of the existing research results relevant to potential impacts of the Proposed Project. A more complete summary and critique of a wider spectrum of sage-grouse research through 2001 can be found in Rowland and Wisdom (2002).

Energy Development:

- Sage-grouse were displaced or otherwise disturbed by oil development and coal mining activities (Braun 1987; Braun 1998; Aldridge 1998; Lyon and Anderson 2003).
- There is some evidence that once the activities ceased numbers returned to pre-disturbance levels (Braun 1987; Remington and Braun 1991).
- Other studies showed a continued disruption of the nesting behavior (Lyon 2000).
- Braun (1998) noted that populations did not attain pre-disturbance levels.
- Removal of vegetation for well sites, access roads, and associated facilities can fragment and reduce the availability of suitable habitat (Aldridge 1998).
- There were fewer males on leks within 0.4 kilometer (0.25 mile) of wells versus counts of males on less disturbed sites (Braun *et al.* 2002).

Fences and Transmission Interconnect Lines:

- Sage-grouse in some areas avoid fences, possibly because they are used as perches by avian predators (Braun 1998).
- Fences and transmission interconnect lines pose hazards because they provide additional perch sites for raptor predators (Ellis 1987; Call and Maser 1985; Braun 1998).
- Sage-grouse could be injured or killed by flying into fences and transmission interconnect lines (Call and Maser 1985; Braun 1998).

- Woven-wire fences are more dangerous to sage-grouse than one-to-three wire-strand fences (Braun 1998).
- Moving away from the transmission interconnect line, numbers of sage-grouse increase for up to 600 meters (0.37 mile) and then level off (Braun 1998).

Habitat Fragmentation:

- Construction of roads, fences, reservoirs, ranches, farms, and housing developments resulted in habitat loss and fragmentation (Braun 1998).
- Man-made structures such as fences, roads, and transmission interconnect lines fragment habitats; sage-grouse avoid these sorts of disturbed areas (Rowland and Wisdom 2002).

Roads/Highways/Vehicles:

- Roads and vehicles result in loss of habitat and direct mortality, and may result in reduction of sage-grouse use of leks within one kilometer (0.8 mile) because of noise (Braun 1998).
- Sage-grouse have been documented to be impacted by vehicles during all seasons (Braun 1998).
- In Wyoming, successful hens in a natural gas field nested farther from roads than did unsuccessful hens (Lyon 2000).
- Light traffic disturbance (one to 12 vehicles/day) near leks during the breeding season might reduce nest-initiation rates and increase distances moved from leks during nest-site selection (Lyon and Anderson 2003).
- More heavily used roads and highways result in direct mortalities of sage-grouse, and contribute to habitat fragmentation (Patterson 1952).
- Sage-grouse have also been known to form leks on well-used roads (Patterson 1952).
- Roads and associated human disturbances can have adverse impacts, especially to lek and winter habitat areas (Wisdom *et al.* 2000).
- Road density in the interior Columbia Basin was higher in range from which Sage-grouse were extirpated, and lower in occupied range (Wisdom *et al.* 2002).

Wind Turbines:

- The effects of construction and operation of the Foote Creek Rim wind power project in Wyoming on sage-grouse could not be documented because no active leks were present on the project site before or during construction (Johnson 2000b).
- Avian mortality monitoring over three years at the Foote Creek Rim wind power project in southern Wyoming found no sage-grouse fatalities (Young *et al.* 2003).

Disturbed/Cleared Areas:

- Sage-grouse used disturbed areas (two gravel pits and one recent burn) as leks (Connelly *et al.* 1981).

Impact Assessment

A slight increase in sage-grouse mortality could result from collisions with wind turbines, transmission interconnect lines, and vehicles due to fatal collisions. Sage-grouse using Cotterel Mountain may collide with the transmission interconnect lines and with the lower reaches of the moving rotors. However, given the relative infrequency of sage-grouse flights (i.e., usually limited to escape reactions, movements to foraging areas, short elevational migrations), it is unlikely that these collisions would be numerous or result in an impact to populations on or in the vicinity of Cotterel Mountain. None of the sage-grouse observed flying were within the RSA of any of the turbine classes during the point counts or fall migration surveys. Collisions with vehicles are more likely, especially if the public is given access to the area; it is assumed that Projected Project maintenance personnel would be trained to be sensitive to the presence of sage-grouse and drive slowly to prevent collisions.

Alternative A (No Action)

Alternative A would not have any impacts on sage-grouse.

Alternative B

Under Alternative B, approximately 261 acres of potential sage-grouse habitat would be directly affected by the Proposed Project. Turbines and roads would be sited within one-quarter mile of all six known sage-grouse leks on Cotterel Mountain. In Wyoming, it was determined that there was no decrease in sage-grouse lek attendance due to the construction or operation of a large wind turbine in the vicinity of active leks (Yeo *et al.* 1984). However, mining activities at a surface coal mine contributed to a drop in male sage-grouse attendance at leks closest to the mining activity and, over time, altered the distribution of breeding grouse (Remington and Braun 1991). A relative of the sage-grouse, the lesser prairie chicken that also uses leks for breeding activities, abandoned 83 percent of their leks and nesting sites when associated with anthropogenic features such as gas and oil rigs. Since the Proposed Project would result in the siting of roads and turbines within one-quarter mile of active sage-grouse leks, it is likely that their presence would result in some level of impact to sage-grouse on Cotterel Mountain. Leks located adjacent to existing or newly constructed Proposed Project roads could experience additional disturbance from increased traffic due to Proposed Project activity.

Based on the best available science for the protection of sage-grouse and their habitat it has been recommended that energy facilities should not be developed within a 1.8 mile radius of sage-grouse leks (Connelly *et al.* 2000). Therefore, it could be assumed that sage-grouse use of habitat within 1.8 miles of the Proposed Project area could affect 26,644 acres of potential habitat under Alternative B (Table 4.6-7). While potential habitat would remain mostly undisturbed, sage-grouse may be displaced due to disturbance from the Proposed Project construction and operation. This does not take into consideration topographical or micro-habitat features of the area that may protect or reduce potential disturbance from the Proposed Project.

Table 4.6-7. Potential Sage-grouse Habitat Loss from the Proposed Project.

Alternative and Impact	Sage-grouse habitat types				
	Breeding (Leks)	Nesting	Brood-Rearing	Wintering	Total
Alternative B					
Permanent impacts from Proposed Project footprint (acres).	84	33	76	68	**261**
Potential displacement impacts within 1.8 miles of the Proposed Project (acres).	3,395	5,605	11,209	6,435	**26,644**
Alternative C					
Permanent impacts from Proposed Project footprint (acres).	77	28	28	48	**181**
Potential displacement impacts within 1.8 miles of the Proposed Project (acres)	3,345	4,980	9,936	5,716	**23,977**
Alternative D					
Permanent impacts from Proposed Project footprint (acres)	52	15	13	34	**114**
Potential displacement impacts within 1.8 mile of the Proposed Project (acres).	3,255	3,194	8,734	4,585	**19,768**

<u>Alternative C</u>

Under Alternative C, approximately 181 acres of sage-grouse habitat would be directly affected by the Proposed Project (Table 4.6-7). This alternative would affect 30 percent less acres of sage-grouse habitat than Alternative B. However, turbines and roads would still be sited within one-quarter mile of all known sage-grouse leks on Cotterel Mountain. Therefore, impacts to sage-grouse would likely still occur under Alternative C.

Within 1.8 miles of the Proposed Project, sage-grouse could be displaced from 23,977 acres of potential habitat under Alternative C. This alternative would affect ten percent fewer acres of potential sage-grouse habitat that Alternative B. Whether the reduced level of affected potential habitat from that estimated for Alternative B would result in lower levels of impact to sage-grouse is unknown, as it would depend on the nature of the reaction of the grouse to the Proposed Project features.

<u>Alternative D</u>

Under Alternative D, approximately 114 acres of sage-grouse habitat would be directly affected by the Proposed Project (Table 4.6-7). This alternative would affect 57 percent fewer acres of sage-grouse habitat than Alternative B and 38 percent less than Alternative C. Turbines and roads would be sited within one-quarter mile of four of the six known sage-grouse leks and no turbines or roads would be sited along the east ridgeline of Cotterel Mountain. This would avoid potential impacts to two sage-grouse lekking areas. Overall, there would be a reduced potential for disturbance to sage-grouse from construction activities and there would be no O&M activities along the east ridge area.

Within 1.8 miles of the Proposed Project, sage-grouse could be displaced from 19,768 acres of potential habitat under Alternative D. This would affect 36 percent fewer acres of potential sage-grouse habitat than Alternative B and 18 percent fewer acres than Alternative C. Whether the reduced level of affected potential habitat from that estimated for Alternative B and Alternative C would result in lower levels of impact to sage-grouse is unknown, as it would depend on the nature of the reaction of the grouse to the Proposed Project features.

4.7 HISTORIC AND CULTURAL RESOURCES

There are three possible effects, which can occur to cultural resource sites as defined by 36 CFR 800:

<u>No Affect</u>: If a site, which is eligible for or on the National Register of Historic Places (NRHP), is avoided, with a suitable buffer zone, which would assure that no disruption or visual intrusion would occur to the site. Sites which are ineligible for inclusion on the NRHP would usually have No Effect determinations although additional information from the site may be needed after the initial evaluation, such as sample collections or detailed mapping, as determined by the BLM guidelines.

<u>No Adverse Affect</u>: A site which is on or eligible for the NRHP may have possible adverse effects mitigated through actions as stipulated in a mitigation plan that is reviewed by the BLM and State Historic Preservation Office.

<u>Adverse Affect:</u> A site which is on or eligible for the NRHP, that has unmitigatable effects taking place, requires that a “Section 106 Compliance Case Report” completed that details the impacts. This Case Report is reviewed by the Advisory Council on Historic Preservation and the State Historic Preservation Office, which results in a Memorandum of Agreement. A case report must be completed on each site so affected.

4.7.1 Alternative A (No Action)

Implementation of Alternative A would have no effects on cultural resources.

4.7.2 Alternative B

Prior to the initiation of any activity, all sites which are currently evaluated as “Potentially Eligible,” will have sufficient data collection conducted so that they may be reevaluated as either eligible or ineligible. Any site which is evaluated to be eligible will have a formal Eligibility Determination completed.

Alternative B would result in the Proposed Project having a range of impacts on sites within the area of potential effects (APE), ranging from no effect (avoidance) to high impact (adverse effect or loss of integrity). Specific impacts to each site would be addressed on an individual basis after proximity of the site to the disturbance was defined more specifically (i.e., practicability of complete avoidance was addressed). Only complete avoidance of all sites would result in the Proposed Project having no effect. While it is likely that at least some sites located within the APE would be avoided, it is more likely that not all would be avoided. As necessary, additional site evaluation would be completed and an assessment of effect would be determined per 36 CFR 800. Mitigation, also determined on an individual site basis, would be required for any unavoidable NRHP listed or eligible site in order to reduce impacts that the Proposed Project would have.

Alternative B would have no impact to sites CM-S-5, CM-S-16, CM-S-20, CM-S-22, or 10CA629 since each of these is located outside of the APE and would be avoided. Proposed Project impacts to the remaining 21 sites, and to any sites discovered during additional survey of the transmission interconnect lines and access roads, would range from no impact to adverse affect depending on if the site is eligible not.

At least four sites, recommended as NRHP eligible, would be subject to adverse effects if they were not avoided during Proposed Project construction. These properties include prehistoric sites CM-S-2, CM-S-3, CM-S-6/8, and CM-S-21, defined by lithic scatters.

Though the Oregon National Historic Trail (10CA862) is listed on the NRHP, and the historic Conner's Corner to Albion Stage Road site (10CA961) is eligible for nomination to the NRHP, the Proposed Project would have no direct impact to these sites because physical evidence of the linear trails/roads is not present in the APE. The Oregon Trail would have bisected the northernmost portion of the APE, however this area has been subjected to historical and modern disturbances such that surviving trail remnants are not visible. Therefore, construction of the transmission interconnect line and expansion of the extant access road near SH-81 would have no direct impact to the integrity of this resource. Indirect visual impacts to intact segments of this resource that are located outside of the APE are addressed in Section 4.13.

Likewise, the integrity of NRHP-eligible site 10CA961, the Conner's Corner to Albion Stage Road, would not be directly affected by the Proposed Project. Though the historic stage road would have bisected the southernmost portion of the APE, the area has been subjected to historical and modern disturbances such that surviving trail remnants are not visible. Because Proposed Project impacts would be confined to the existing access road that heads north from the SH-77 junction for the first one-quarter mile, there would be no impact to this resource.

Four sites located in the APE that are currently unevaluated for NRHP eligibility include lithic scatters at sites CM-S-4, CM-S-10, and 10CA298, and the historic railroad grade, 10CA864. The unevaluated sites would require additional testing and evaluation prior to determination of impact or Proposed Project effect if they were not avoided during Proposed Project construction.

The remaining sites and isolates determined to be ineligible for nomination to the NRHP would be subject to impacts ranging from no impact to high impact. Regardless of Proposed Project impacts, per 36 CFR 800, no further management would be required for these sites.

4.7.3 Alternative C

Prior to the initiation of any activity, all sites which are currently evaluated as "Potentially Eligible," will have sufficient data collection conducted so that they may be reevaluated as either eligible or ineligible. Any site, which is evaluated to be eligible, will have a formal Eligibility Determination completed.

Impacts for Alternative C are similar to impacts for Alternative B with the exception that the Proposed Project would have no impact to site CM-S-17 in Alternative C because this site would be avoided.

4.7.4 Alternative D

Prior to the initiation of any activity, all sites which are currently evaluated as "Potentially Eligible," will have sufficient data collection conducted so that they may be reevaluated as either eligible or ineligible. Any site, which is evaluated to be eligible, will have a formal Eligibility Determination completed.

Impacts for Alternative D are similar to impacts for Alternative C with the exception that the Proposed Project would have no impact to sites CM-S-21, CM-S-22, CM-S-18, and CM-S-1 in Alternative D because these sites would be avoided. Alternative D would have the fewest impacts to historical and cultural resources.

4.8 AMERICAN INDIAN CONCERNS

Impacts to American Indian concerns would be identified during government-to-government consultation. These consultations would be sensitive to the Tribes and would be resolved with the Tribes.

4.8.1 Alternative A (No Action)

Implementation of the No Action Alternative would have no impacts on cultural resources.

4.8.2 Alternative B

As of the publication of the Draft EIS, no sites of concern have been identified.

4.8.3 Alternative C

As of the publication of the Draft EIS, no sites of concern have been identified.

4.8.4 Alternative D

As of the publication of the Draft EIS, no sites of concern have been identified.

4.9 SOCIOECONOMICS

4.9.1 Alternative A (No Action)

Alternative A would result in no impacts or changes to regional or local socioeconomic conditions because the Proposed Project would not be constructed. The Proposed Project area would continue to function as a dispersed recreation area and would continue to provide seasonal grazing opportunities for livestock. The Mini-Cassia area would not experience the tax revenue benefits that would be associated with the Proposed Project.

4.9.2 Alternative B

Community and Regional Economy

<u>Construction</u>

Construction of the Proposed Project would last approximately eight months, from April through November of 2006. The cost of construction would be approximately $200 million, the majority of which would be the cost of the towers and turbines. Table 4.9-1 presents an approximate breakdown of the Proposed Project construction cost.

Table 4.9-1. Construction Costs ($1000s) of the Proposed Project.

Type of cost	**Cost**
Labor (107 to 132 construction workers)	$3,000
Non-labor costs	$197,000
130 foundations at $60,000 each, and concrete batch plant	$8,000
Wind turbines and towers	$160,000
Other materials and non-labor costs	$10,000
Roads, O&M building, site preparation	$3,000
Electrical and communications	$16,000
Total construction cost	**$200,000**

The aggregate for the concrete batch plant would be purchased within the Mini-Cassia area, along with other standard and available materials and supplies that would be needed for construction.[1] Approximately five workers would constitute the road crew for the road building. The larger crew for the eight-month general construction period would average between 107 and 132 workers. Since the construction process would be an "assembly line" type of operation, the beginning and end of the

[1] The IMPLAN model assumes 20 percent of non-labor costs of construction (excluding cost of wind turbines and towers) would be spent within Cassia County or Minidoka County.

construction period would involve a slightly lower number of workers when compared to the middle months. The breakdown of the construction workforce by type is shown in Table 4.9-2.

Table 4.9-2. Construction Workforce for the Proposed Project.

Type of Worker	Average Number Required Throughout the Construction Period
Carpenter/form setter	7
Cement finisher	3
Cement, rebar	4
Electrician helper	17
Electrician, industrial	11
Electrician, master	2
Laborer	43
Structural steel worker	9
Backhoe operator	5
Cherry picker operator	7
Cable crane operator	5
Dozer operator	2
Power shovel operator	3
Road roller operator	2
Estimated daily total	**107 to 132**

Laborer positions and other construction worker positions that do not require specialized skills would likely be filled from the local Mini-Cassia area labor force.[2] The maximum 132-person workforce would represent one-fifth of construction employment in the Mini-Cassia area. Non-local workers could originate from other counties in south central Idaho, or also from further distances. The few construction workers who are predicted to commute on a weekly basis would stay in local lodging and would likely have less than an hour drive each way to the job site.

Assuming ten percent of the construction workforce would commute on a weekly basis, a maximum of 14 workers would need lodging during the week. Local lodging facilities would have sufficient availability to accommodate these workers during the week.

Construction activity would result in secondary economic impacts (both indirect and induced) within the Mini-Cassia area. Secondary employment effects would include (1) indirect employment resulting from the purchase of goods and services by firms involved with construction, and (2) induced employment resulting from construction workers spending their income in the local area. Similarly, indirect and induced income and spending effects would also occur as “ripple” effects from construction. Indirect and induced impacts were estimated using IMPLAN economic modeling software, an input/output model specific for the economic study area of Cassia County and Minidoka

[2] The IMPLAN model assumes 60 percent of the construction workforce would originate from Cassia County or Minidoka County.

County (IMPLAN 2003). Estimated indirect and induced effects of construction that would occur within Mini-Cassia may add 50 jobs, approximately $1 million in labor income, and approximately $3.3 million in total output. Similar to direct economic impacts from construction, these secondary economic impacts would occur one time. The secondary impacts would likely lag behind direct impacts by six to 12 months.

In summary, approximately 40 percent of construction workers (53 workers) could originate from outside the Mini-Cassia area, and approximately ten percent (14 workers) would commute weekly. This would result in a temporary additional daily population in the area surrounding the Proposed Project from Monday through Friday, during the construction period. The change would be noticeable because the population near the Proposed Project area is small (e.g., 48 residents in the five census blocks near where the Proposed Project is located, 177 residents in Malta, and 262 residents in Albion). However, the population increase would be temporary and would only occur during the week (the majority of the increase would occur during daytime hours only, not overnight). The impact of additional population would be low because population near the Proposed Project area would not grow substantially or permanently. The increase in demand for services would be small and temporary, and no businesses or residences would be displaced by the Proposed Project construction. Communities and businesses would retain their physical arrangement and function. Workers would not likely relocate to cities or unincorporated areas near the Proposed Project area because the construction period would be relatively short.

Beneficial impacts to local businesses and the economy would include: additional spending by workers for food, gas, and lodging; spending by the construction contractor for supplies and standard materials needed for construction; and additional jobs and related income. These impacts are expected to be low to moderate.

Changes in tourism use and spending would likely represent no impact to a low impact due to construction because (1) the construction period would be relatively short, and (2) construction activities would be occurring in an area that is not widely used. Additionally, the “assembly line” construction sequencing allows construction to be completed in one area before construction is begun in the next. Therefore, construction would only occupy one section of the Proposed Project area at one time, freeing other areas for recreational activities.

Construction of the Proposed Project, and in particular, the road system, would require materials to be transported by truck. Approximately 14,940 truck trips would be required under Alternative B. Of these total truck trips, 12,735 truck trips would be for the purpose of road building. These truck trips would result in impacts on local communities similar to impacts from truck trips transporting agricultural goods during harvest season. Types of impacts would include noise, dust, and additional traffic on roads.

Fiscal Impacts

Sales and/or use tax revenue on the construction contract would accrue to Cassia County because Cassia County is the location of the Proposed Project construction. The contractor would need to apply for a use tax account with the Idaho State Tax Commission (ITC 2004). Sales tax revenue on the construction contract would be approximately $12 million. This one-time beneficial fiscal impact would more than double retail sales tax revenue accruing to Cassia County that year.

Minidoka County would benefit from sales tax revenue to the extent that construction or operation employees purchase goods or services in Minidoka County.

Operation

Community and Regional Economy

The Proposed Project operation would be expected to begin in late 2006 or early 2007, and would involve operation of the wind turbines 24 hours per day, seven days per week. Operating the Proposed Project would cost approximately $4.5 million annually (Table 4.9-3).

Table 4.9-3. Annual Cost of Operation and Maintenance ($1000s) of the Proposed Project.

Type of cost	Cost
Labor	$600
Non-labor costs	$3,900
Portion of non-labor costs occurring locally (does not include lubricants)	$1,000
Total annual operation cost	**$4,500**

Notes: The labor cost of $600,000 would include salaries, benefits, and other labor-related costs.

Twelve employees would work at the Proposed Project on a permanent basis, including one office administrator, one foreman, and ten windsmiths/electricians. Employees would work eight-hour shifts, five days per week, with the exception of five of the windsmiths, who would likely rotate shifts to cover nights and weekends. It is anticipated that all permanent positions with the exception of the foreman position would be filled from the local labor force (within the Mini-Cassia area). Some windsmith training would be provided to those who have a basic understanding of electrical work.

In addition to labor costs, the cost of operation also includes maintenance and other non-labor costs associated with operating the turbines and transmitting power. Maintenance costs could increase slightly in the future, after the five-year warranty on the turbine expires. The Applicant would employ on-call staff to address potential turbine breakdowns.

Similar to construction, operation of the Proposed Project would result in secondary (indirect and induced) economic impacts that would occur within the Mini-Cassia area.[3] Indirect and induced

[3] The IMPLAN model assumes that 25 percent of non-labor operation and maintenance costs would be spent within Cassia County or Minidoka County.

impacts were estimated using IMPLAN (IMPLAN 2003). Unlike indirect and induced impacts from construction, indirect and induced impacts from operation would represent permanent increases in area economic variables. These impacts would lag behind direct economic impacts by approximately six to 12 months. Estimated indirect and induced impacts of Proposed Project operation that would occur within the Mini-Cassia area on an annual basis would be an additional seven permanent jobs, $145,000 in labor income, and approximately $472,000 in output.[4]

In summary, it is expected that one operation employee, at most, would originate from outside the area. This would not represent an increase in population, concentration of population, or increase in demand for public services. Operation of the Proposed Project would not disrupt or displace businesses or residences, and would not divide a community.

Low but beneficial economic impacts to the local community and economy would include 12 new permanent jobs and related income, and additional spending at local establishments by workers (gas and food) and by the Applicant (supplies and standard materials for operational and maintenance functions).

Use of the area by tourists and spending by tourists would not likely decrease substantially in the long run. Visual impacts to recreationists traveling in the area would likely occur. However, since Cotterel Mountain is not a destination recreation location, construction of the Proposed Project should not alter the decision of tourists to travel through the area. Therefore, tourism would not likely be affected by views of the Proposed Project. Users that chose to recreate on Cotterel Mountain in proximity to the Proposed Project would experience change in views compared to current conditions.

Fiscal Impacts

Property Tax

After construction, the Proposed Project property would remain public land. ITC would set the estimated value of improvements because the property would be newly classified as “operating property.” According to the ITC, the estimated value of improvements would be $194 million of the $197 million non-labor cost of the Proposed Project, because $3 million would be the cost of roads and transmission interconnect lines. The transmission interconnect lines would be turned over to Bonneville Power Administration (BPA) or to Raft River Rural Electric. Accordingly, the ITC estimates that the Proposed Project would add approximately $197 million in value of improvements in Cassia County (ITC 2003b).

Sales Tax

Sales tax revenue accruing to Cassia County would increase due to increased retail sales (i.e., supplies purchased) attributable to Proposed Project construction. Assuming approximately $7.5 million (20%

[4] The IMPLAN model assumes that seven of the 12 operation employees would originate from the Mini-Cassia area.

of non-labor construction costs excluding the cost of the wind turbines and towers) is spent locally, the one-time increase in sales tax revenue would be approximately $500,000.

Similarly, assuming an annual $1 million is spent each year in the Mini-Cassia area for Proposed Project operation, the permanent increase to annual sales tax revenue would be $60,000. This estimate would increase to the extent construction and operation employees spend money locally on gas, food, and lodging throughout the area. According to the ITC, the amount of sales tax revenue that is returned to each county depends on population and assessed value (Poplar 2003). Therefore, because the Proposed Project would result in an increase in property value in Cassia County, the portion of sales tax revenue returned to the county should also rise. This would represent a moderate impact.

Cassia Joint School District No. 151

According to the distribution of property taxes, Cassia Joint School District No. 151 would receive an additional $1.3 million per year due to the Proposed Project.[5] As a result of this increase in tax revenue, the state would act in two ways: it would remove financial support that is currently provided to the School District, and it would replace those funds through the state property tax replacement system. The net effect of these actions would be an increase in revenues of only $123; therefore, the School District would experience a property tax benefit associated with the Proposed Project. These increases would benefit school districts in the State of Idaho, including Cassia County School District (Times News 2004).

Road Maintenance

The scoping process for this Draft EIS indicated that local citizens are concerned about increased demand for road maintenance by local agencies. The increased demand would result from increased use of existing roads throughout the Proposed Project area, and construction of new roads, for the purpose of Proposed Project construction and operation. Local taxes such as property taxes, sales taxes, and use taxes are meant to cover these additional costs associated with any type of development.

<u>Property Values</u>

Construction

The proposed construction period would be approximately eight months. Because construction (workers, heavy equipment, staging areas, etc.) on the Proposed Project would be temporary and because the Proposed Project is located over two miles from the nearest residence, adverse property value impacts (decreases in property value due to views to construction) attributable to Proposed Project construction are not expected to occur.

[5] The estimate of $1.3 million in additional property tax revenue accruing to Cassia Joint School District No. 151 is supported by a study completed in March 2003 by the ITC, "Proposed Cotterel Mountain Wind Farm Project – Likely Effect on Cassia County Property Taxes" (ITC 2003).

Operation

ECONorthwest prepared a study that analyzed the economic effects of a wind power project on private land in Kittitas County, Washington (ECONorthwest 2002). The study included an assessment of property value impacts due to wind power projects. ECONorthwest (1) conducted a phone survey of tax assessors for counties that recently had wind turbines installed in their areas; (2) reviewed current literature to find statistical studies that quantified the impacts of wind turbines on property values, and (3) reviewed literature on the impacts that transmission interconnect lines have on property values. Assessors were chosen for interviews if the projects within their counties were ten years old or less, were viewed from residential properties, and had multiple turbines. ECONorthwest found that "views of wind turbines would not impact property values." ECONorthwest did not find evidence supporting the claim that views of wind farms decrease property values (ECONorthwest 2002). Applying the ECONorthwest research, even if a visual impact were to occur as a result of this Proposed Project, resulting decreases in property values would not necessarily occur.

Social Values

The Proposed Project would not interfere substantially with social values in the area. Grazing, hunting, and other activities that currently take place at Cotterel Mountain would continue to occur. Due to the increased public access provided by the new and improved roads that would be built as part of the Proposed Project, activities such as hunting could increase. Income that currently accrues to the Mini-Cassia area due to tourism is not likely to decrease because the activities would remain available, and the quality of the recreational experience would remain similar.

Many people who submitted comments during the scoping period wrote in support of the Proposed Project. However, there were those, including some living near the Proposed Project area, who had concerns about property issues (value changes and maintaining boundaries when public access increases), recreation issues (increases in use due to greater public access and possible decrease in desirability due to perception of views), and fiscal impacts (tax impacts and increased need for road maintenance). There are also those, particularly in and surrounding the community, who are strongly opposed to the Proposed Project. This has contributed to a negative change (although minor) in the cohesiveness of the community and may continue to do so.

Environmental Justice

The Mini-Cassia area has more minority and low-income residents when compared to the south central region of Idaho and the State of Idaho. The five census blocks within which the Proposed Project would be constructed are, as a whole, eight percent minority, which is a lower percentage than the same measure for the Mini-Cassia area, South Central Idaho, and the State of Idaho. Similarly, the block group within which the Proposed Project would be constructed is ten percent minority, which is a lower percentage than the same measure for the Mini-Cassia area, South Central Idaho, and the State of Idaho. The residents closest to the Proposed Project, who would experience much of the temporary impacts of construction, should not be identified as a minority or low-income population.

Therefore, minority and low-income populations would not experience disproportionate impacts as a result of the Proposed Project.

4.9.3 Alternative C

Under Alternative C, construction and annual operation cost would be similar to Alternative B; therefore, the impacts would be similar. Under Alternative C, slightly fewer truck trips would be required than under Alternative B, and impacts due to the truck trips would be similar.

4.9.4 Alternative D

Alternative D would have 40 to 50 percent fewer turbines than Alternative B. Socioeconomic benefits such as tax revenue increases due to the Proposed Project would therefore be less in magnitude, and adverse impacts such as disturbances due to construction of the Proposed Project would likely be shorter in duration and less in magnitude. The type of impacts would be similar to Alternative B.

<u>Construction</u>

Community and Regional Economy

The cost of construction would be approximately $125 million, based on the smaller number of turbines. The breakdown of costs would be proportionally the same as shown in Table 4.9-1. The type and amount of employment and the origin of workers would be similar to Alternative B. Secondary impacts would be similar in type to Alternative B, but smaller in magnitude. Impacts would be low to local businesses and the economy such as additional spending by workers for food, gas, and lodging; spending by the construction contractor for supplies and standard materials needed for construction; and additional jobs and related income. Impacts to tourism and related spending would be similar to Alternative B. Under Alternative D, fewer truck trips would be required, approximately one-third less than under Alternative B. Similar to other types of impacts under Alternative D, impacts from truck trips would be the same in type, but less in magnitude and duration when compared to Alternative B.

Fiscal Impacts

Sales or use tax revenue impacts would be similar to Alternative B, except smaller because the construction contract amount would be smaller.

<u>Operation</u>

Community and Regional Economy

Operating the Proposed Project under Alternative D would cost approximately $2.9 million annually, based on the smaller number of turbines. The number of employees and related income associated with operation would be less than under Alternative B. The breakdown of operation costs would be proportionately the same as shown in Alternative B. Secondary impacts would be the same in type as Alternative B, but smaller in magnitude due to the smaller number of turbines.

Fiscal Impacts

The effect on property tax revenue under Alternative C would be less than Alternative B because the estimated value of the improvements to the land would be less. The additional revenue from the construction of the Proposed Project would likely be distributed in the same manner as Alternative B (Table 3.5-11).

Accrued sales tax revenue for Cassia County would also be less in comparison to Alternative B; therefore, fewer funds would be available for the School District under Alternative C, because the value of the improvements to the land would be less.
Issues related to road maintenance would be the same as under Alternative B.

Property Values

The type of impacts due to construction would be the same as under Alternative B. Similar to under Alternative B, impacts (decreases) to property values due to changed views would not likely occur due to operation.

Social Values

Issues related to social values would be the same as under Alternative B.

Environmental Justice

Similar to Alternative B, minority and low-income populations would not experience disproportionate Proposed Project impacts.

4.10 LANDS AND REALTY

This section discusses the potential effects to land ownership, land uses, and land management plans in the Proposed Project area.

4.10.1 Land Status and Ownership

Surface or mineral ownership would not change by implementing any of the alternatives. No direct or indirect effects to existing surface land ownership or mineral ownership would occur by implementing any of the alternatives.

The proposed wind turbines, roads, and ancillary facilities would be located on federal lands under the jurisdiction of the BLM. ROW approvals would be obtained from the BLM in accordance with the processes outlined in 43 Code of Regulations 2800 and the BLM ROW Handbook (H-2800-1).

4.10.2 Land Use

The primary impacts to land use associated with the Proposed Project are tied to change in landscape character, aesthetic quality and prior land use. Current predominant land use in the Proposed Project area consists of wildlife habitat, livestock grazing and recreation.

4.10.3 Alternative A (No Action)

Alternative A would result in no change to landscape character, aesthetic quality or existing land uses within the Proposed Project area or its vicinity.

4.10.4 Alternative B

Moderate impacts would occur from an overall change in landscape character from a remote to an industrial character and a decline in the aesthetic quality of the land for recreational uses. No permanent changes to land use are expected within the Proposed Project area. All surface equipment would be removed from the area at the end of the economic life of the Proposed Project, and reclamation would restore disturbed sites to near prior conditions. All actions would be in conformance with county, state, and federal land use plans.

Livestock grazing, recreation and wildlife use would continue within the Proposed Project area during construction and operation. Impacts to these resources are discussed in the individual resource sections. Prior land uses would be re-established after decommissioning of the Proposed Project, and final reclamation of turbine pads and roads.

4.10.5 Alternative C

For Alternative C, impacts to land use would be the similar to Alternative B. Under Alternative C, fewer miles of access road would be constructed, providing less access to the area than Alternative B.

4.10.6 Alternative D

Alternative D would have the fewest impacts to land use due to a smaller area of construction (fewer turbines) and fewer miles of access road.

4.11 RECREATION

Primary impacts to recreation are based on how the Proposed Project could change the Recreation Opportunity Spectrum (ROS) classification within the Proposed Project area and takes into account: existing recreation opportunities for activities such as camping, hunting, OHV use and sightseeing; visitor use; and potential for improvement of recreation facilities. Changes in visitor type or experience and degree of lost opportunities were used as indicators in the evaluation process.

4.11.1 Alternative A (No Action)

Based on the activities outlined in the Cassia RMP, no change to recreation opportunities or degree of use would be anticipated in the area, beyond some minor modifications to recreation facilities and trails. These modifications are expected to enhance the recreation spectrum in the Proposed Project area.

4.11.2 Alternative B

Under Alternative B, impacts to recreation resources are expected to be moderate. Public access to federal and state lands within the Proposed Project area would not be restricted, except during construction of the Proposed Project for safety purposes. Following Proposed Project construction, public access to federal and state lands would be improved with about 25 miles of new or reconstructed roads. During construction of the Proposed Project, noise, dust, traffic, equipment use, and associated human activities would change the character of the area and result in a temporary loss of recreational opportunities.

The Proposed Project would alter the aesthetic sense of Cotterel Mountain as a rural, undeveloped recreational area. The improved road system would likely result in an increased number of visitors to the area, and the daily presence of O&M personnel may discourage visitors seeking solitude. Increased access would enhance opportunities for legal hunting and wildlife sightseeing for some recreational users. However, this could lead to occurrences of poaching and other disturbances to big game and other wildlife.

The Proposed Project may attract tourists to the area. The types of visitors could shift from predominately local visitors to visitors from outside the area that would be interested or curious about the wind turbines and energy generation. The novelty of the wind turbines and change from the relatively undeveloped prairie and sagebrush landscape along I-84 would likely cause some travelers to view the Proposed Project with interest. Drivers passing by may be intrigued by the wind towers and stop to investigate or photograph them. Interpretive panels may be erected at the rest area along I-84 east of the Proposed Project area or at other locations along highways to inform drivers of the Proposed Project.

Under Alternative B, a wind turbine would be located within about 760 feet of the Coe Creek picnic site. Visitors to the picnic site may be able to hear the wind turbines at times of turbine operation. In addition, several turbines would be visible from the picnic site. The auditory and visual presence of the wind turbines may deter some visitors from using the picnic site. Other visitors may be attracted to the picnic site by its unique location within an operational wind power generation facility.

All surface equipment and structures would be removed during final reclamation. All turbine locations, selected roads, and other disturbed sites would be reclaimed to reestablish grazing lands, wildlife habitat, and recreational use. Some roads may be retained upon Proposed Project completion allowing increased recreational use of the area.

The potential impacts to recreation could result in a change of visitor/use or experience. These potential changes to recreation use would not alter the current ROS category (semiprimitive motorized) for Cotterel Mountain and would not be in conflict with the Cassia RMP.

4.11.3 Alternative C

Under Alternative C, the Proposed Project would require the reconstruction of about three miles of road and the construction of about 19.5 miles of new roads (about 23 miles total). Public use of Proposed Project roads would be restricted through a series of gates and natural rock barriers but would not result in a loss of access to traditional use areas. Primitive access would be maintained wherever possible by linking the existing primitive road system through construction of new primitive roads. Similar to Alternative B, impacts to recreation resources are expected to be moderate.

Under Alternative C, the closest wind turbine would be located within about one-quarter mile (1,400 feet) of the Coe Creek picnic site. Visitors would likely be able to hear the turbines during times of turbine operation but less so than under Alternative B. Turbines would still be visible from the Coe Creek picnic site.

The potential impacts to recreation under Alternative C could result in a change of visitor/use or experience. These potential changes to recreation use would not alter the current ROS category (semiprimitive motorized) for Cotterel Mountain and would not be in conflict with the Cassia RMP.

4.11.4 Alternative D

Under Alternative D, the Proposed Project would require the reconstruction of about three miles of road and the construction of about 15 miles of new roads (about 18 miles total). Public use of Proposed Project roads would be restricted through a series of gates and natural rock barriers but would not result in a loss of access to traditional use areas. Primitive access would be maintained wherever possible by linking the existing primitive road system through construction of new primitive roads. Similar to Alternative B and Alternative C, impacts to recreation resources are expected to be moderate.

Impacts to users of the Coe Creek picnic site would be the same as those described under Alternative C.

The potential impacts to recreation under Alternative D could result in a change of visitor/use or experience. These potential changes to recreation use would not alter the current ROS category (semiprimitive motorized) for Cotterel Mountain and would not be in conflict with the Cassia RMP.

4.12 LIVESTOCK GRAZING

Primary impacts to livestock grazing are based on how the Proposed Project could affect forage availability for livestock grazing, grazing management, and Animal Unit Months (AUMs). The information on current grazing permits in the Proposed Project area (Table 3.8-1) was used for calculating impacts. The following indicators were used in assessing potential impacts to grazing:

- Acres of forage disposed from grazing for livestock and wildlife; and
- Changes in range conditions and alteration of current range improvements.

4.12.1 Alternative A (No Action)

Based on the activities outlined in the Cassia RMP no changes to grazing would be expected in the area beyond some vegetation treatments or minor range improvement projects to facilitate livestock grazing. Under Alternative A, these modifications are not expected to impact livestock grazing.

4.12.2 Alternative B

A temporary loss of rangelands, associated with construction activities, would reduce forage availability on approximately 368 acres (3%) from the North and South Cotterel Allotments. This estimate is based on 100 percent of the affected area being available as forage, even though a percentage of these areas is of no forage value, i.e. rock outcrops, roads, bare ground, etc. It is assumed that impacts on range resources from construction activity would be evenly distributed throughout both grazing allotments. Following construction of the Proposed Project, reclamation and revegetation efforts would restore range improvement projects and forage availability on approximately 165 acres (45% of the impacted area). Restoration of disturbed vegetation to pre-construction conditions is expected to take approximately three to five years. Permanent impacts to rangeland vegetation would result in a loss of forage on approximately 203 acres (2%) of the Proposed Project area.

The overall response of livestock to a fully operational wind power project is difficult to assess. It is likely that most of the livestock would habituate to the presence of the operating wind power project as well as to the increased traffic associated with maintenance of the Proposed Project. Some livestock may not habituate to the presence of the Proposed Project and its associated activities. These animals would likely stay some distance from the turbine strings and access roads; it is unknown if this displacement would adversely effect the range resource or the behavior and fitness of livestock.

Clearing existing vegetation from construction sites may provide a corridor for the spread of invasive and noxious weeds, which could reduce available forage, and in some instances, be harmful to the health of livestock. Based on the amount and distribution of area impacted by Alternative B, impacts to grazing operations would not be appreciable during construction and throughout the period of operation of the Proposed Project.

4.12.3 Alternative C

Impacts to livestock grazing from Alternative C would be similar to Alternative B, but the total number of acres initially affected would be slightly less. The amount of available forage for livestock use would be greater under Alternative B. Alternative C would initially impact approximately 337 to 350 acres (3%) of rangeland currently available for grazing within the Proposed Project area. Following construction of the Proposed Project, reclamation and revegetation efforts would restore range improvement projects and forage availability on approximately 134 to 147 acres (40% to 42% of the impacted area). Restoration of disturbed vegetation to pre-construction conditions is expected to take approximately three to five years. Permanent impacts to rangeland vegetation would result in a loss of forage on approximately 203 acres (2%) of the Proposed Project area.

4.12.4 Alternative D

Impacts to livestock grazing from Alternative D would be similar to Alternative B and Alternative C, but the total number of initial and permanent acres affected would be less. The amount of available forage for livestock use would be greatest under Alternative D. Alternative D would have the least amount of impact to livestock grazing compared to Alternative B and Alternative C. Alternative D, would initially impact approximately 269 to 282 acres (3%) of rangeland currently available for grazing within the Proposed Project area. Following construction of the Proposed Project, reclamation and revegetation efforts would restore range improvement projects and forage availability on approximately 111 to 123 acres (41% to 44% of the impacted area). Restoration of disturbed vegetation to pre-construction conditions is expected to take approximately three to five years. Permanent impacts to rangeland vegetation would result in a loss of forage on approximately 159 acres (1%) of the Proposed Project area.

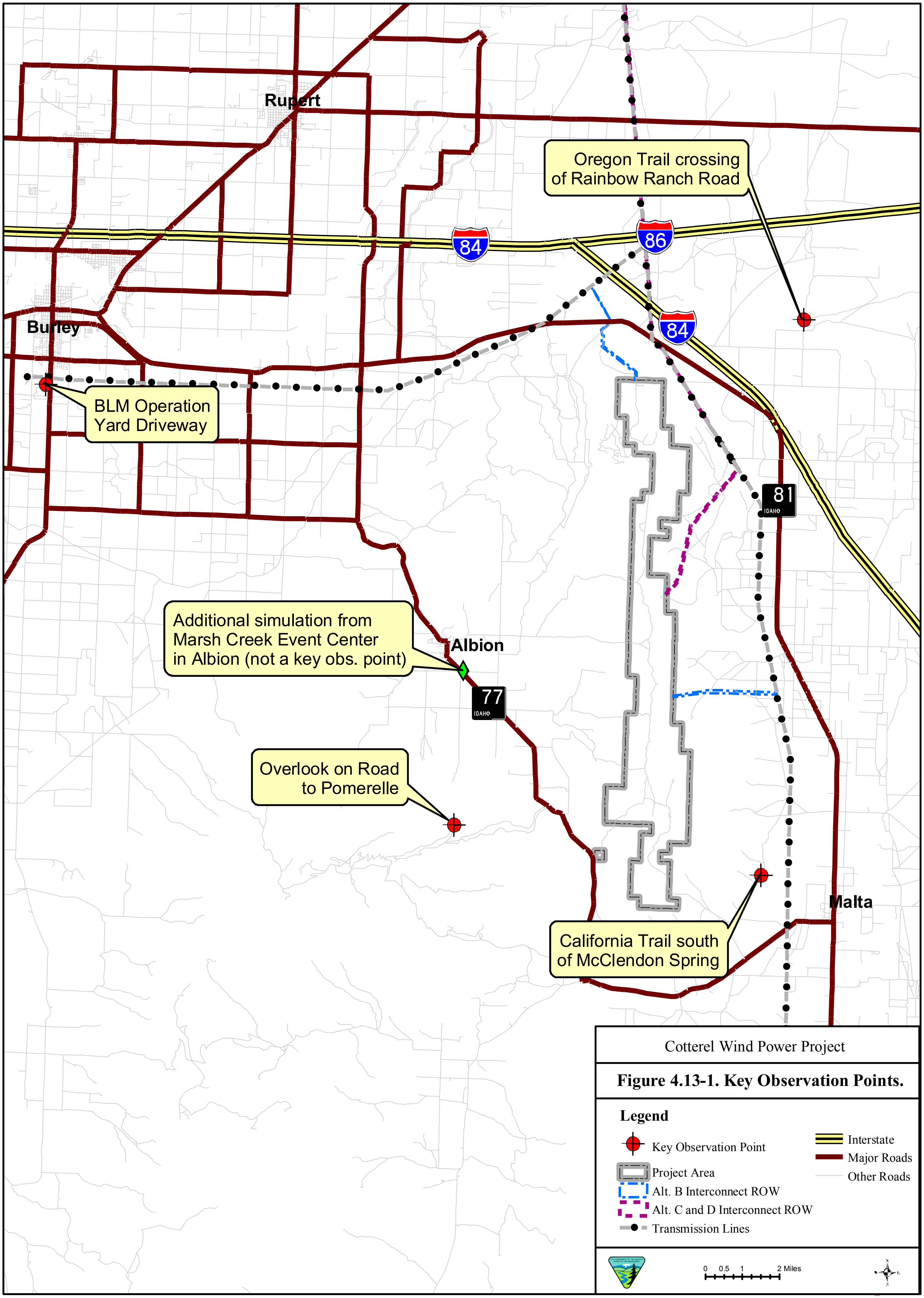
4.13 VISUAL RESOURCES

Visual Resource Contrast Rating involves determining whether the potential visual impacts from proposed surface-disturbing activities or developments would meet the management objectives established for the Cotterel Mountain area or whether design adjustments would be required for the Proposed Project. The Visual Resource Contrast Rating method is summarized below, followed by the Visual Resource Contrast Rating for the Proposed Project

4.13.1 Visual Resource Contrast Rating Method

The Visual Resource Contrast Rating method is a systematic process used by the BLM to analyze potential visual impacts of a proposed action. The degree to which a proposed action affects the visual quality of a landscape depends on the visual contrast created between a proposed action and the existing landscape. The contrast can be measured by comparing the proposed action features with the existing major landscape features. The basic design elements of form, line, color, and texture are used to make this comparison, and to describe the visual contrast created by the proposed action. This process provides a means for determining visual impacts and for identifying measures to mitigate these impacts.

To assess the visual impact from the Proposed Project, contrast ratings were completed from the most critical viewpoints, called key observation points (KOP). Initially, the BLM selected 12 KOP along commonly traveled routes, or at other likely observation points, such as the Pomerelle Mountain Resort. Specialists from the BLM evaluated these 12 points and chose four KOP as representing the best scenic value for the Proposed Project (Figure 4.13-1). The visual observation team visited, photographed, and rated the viewshed of the Proposed Project area from each of the four KOP. Photographs of the Proposed Project area were incorporated into a computer-generated visual simulation of the completed Proposed Project. From each KOP, the computer-generated simulation portrayed the proposed turbines in their proper locations and at the correct scale (Appendix G). Using these simulations, the specialists each completed the BLM visual contrast rating worksheets. A fifth site, in the town of Albion, was also photographed and computer-generated simulation created. However, this site was not selected as a KOP. Appendix G includes the visual simulations used for the visual contrast rating.



Cotterel Wind Power Project

Figure 4.13-1. Key Observation Points.

The team assessed the visual contrasts between the viewshed of the Proposed Project area and the existing viewshed. The team identified the basic features (landform, vegetation, and structures) and the basic elements (form, line, color, and texture) that cause contrast. The proposed development would primarily consist of landform features (e.g., roads and pads) and structural features (e.g., turbines, transmission interconnect lines). Each member of the team then rated the degree of contrast (none, weak, moderate, or strong) for each basic element within each basic feature using the visual resource contrast rating criteria (Table 4.13-1).

Table 4.13-1. Visual Resource Contrast Rating Criteria.

Degree of Contrast	Criteria
None	The contrast is not visible or perceived.
Weak	The contrast can be seen but does not attract attention.
Moderate	The contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The contrast demands attention, will not be overlooked, and is dominant in the landscape.

<u>Visual Resource Contrast Rating Results</u>

The individual contrast ratings produced by each member of the visual assessment team were averaged. Table 4.13-2 lists the average visual contrast rating for the four KOP (Figure 4.13-1).

The contrast ratings were then compared to the approved Visual Resource Management (VRM) Inventory classes. For comparative purposes, the four levels of contrast (none, weak, moderate, and strong) roughly correspond with VRM Inventory classes I, II, III, and IV, respectively. Therefore, a "strong" contrast rating may be acceptable in a VRM Inventory Class IV area. All of the proposed turbine strings fall within VRM Inventory Class IV.

The team also assessed the cumulative effect of all the contrast ratings, because a combination of ratings may suggest that there is a stronger overall contrast than the individual ratings show. For example, several "moderate" ratings, when viewed in combination, may warrant an overall "strong" visual contrast rating for the view of the Proposed Project from a particular KOP. Using this guidance, the Proposed Project would cause: an overall “moderate to strong” visual contrast when viewed from the Pomerelle KOP; overall “weak to moderate” visual contrasts when viewed from the Oregon Trail KOP and California Trail KOP; and an overall “weak” visual contrast when viewed from the BLM Office KOP.

Table 4.13-2. Visual Contrast Rating for the Proposed Project.

		LAND	VEGETATION	STRUCTURES
KOP 1: California Trial				
ELEMENTS	FORM	None	None	Moderate
	LINE	Moderate	None	Moderate
	COLOR	Moderate	Moderate	Moderate
	TEXTURE	Weak	Weak	Moderate
KOP 2: Oregon Trial				
ELEMENTS	FORM	Weak	None	Moderate
	LINE	Moderate	None	Moderate
	COLOR	Moderate	Moderate	Moderate
	TEXTURE	Moderate	Weak	Moderate
KOP 3: Howell Canyon Road				
ELEMENTS	FORM	Weak	Weak	Moderate
	LINE	Strong	Weak	Moderate
	COLOR	Moderate	Moderate	Moderate
	TEXTURE	Moderate	Weak	Moderate
KOP 4: BLM Office				
ELEMENTS	FORM	Weak	Weak	Weak
	LINE	Weak	None	Weak
	COLOR	Weak	Weak	Weak
	TEXTURE	Weak	None	Weak

4.13.2 Alternative A (No Action)

Under Alternative A, no impact to visual resources would occur from the Proposed Project.

4.13.3 Alternative B

<u>Construction Phase</u>

Visual resources could be impacted over the short-term during the construction phase due to the amount of vehicle and heavy equipment traffic associated with the Proposed Project. The number of truck trips necessary to complete the Proposed Project would be greatest under this alternative.

Impacts from dust plumes may be associated with construction of the proposed North and South Access Roads. Construction of these roads would involve a cut-and-fill process, using earth-moving equipment. The proposed North Access Road passes through the scenic corridor associated with SH-81. The proposed South Access Road would be visible from a Class II designated area associated with SH-77, (part of the City of Rocks Backcountry Byway). Both these areas have increased sensitivity to visual impacts due the public visibility associated with nearby highways and I-84. Impacts from traffic and dust created by constructing both the access roads would be short-term.

Cranes used to raise the towers could be visible from sensitive areas. Although the cranes would be operating within a Class IV area, they could be visible from the Class II designated area to the southwest. This would represent an impact to visual resources. Crane activity would be the greatest under this alternative.

Construction of the two transmission interconnect lines would be visible from the north and east side of the Proposed Project area. The north transmission interconnect line would pass over SH-81 and its associated scenic corridor. Construction crews and equipment would be visible to the public in this area and may result in visual impacts. The eastern transmission interconnect line would pass through a Class IV designation. Construction crews and equipment would be visible from the scenic corridor associated with SH-81, resulting in a visual impact.

Operational Phase

Under Alternative B, the west string would be about 0.8 mile in length and located along a short side-ridge, west of the main Cotterel Mountain ridgeline. This ridgeline resides within a Class IV designated area, but would be visible in the foreground-middleground zone from the Class II designated areas to the west, resulting in a direct impact to visual resources over the long-term.

The center string of wind turbines would be about 10.9 miles in length and placed along the spine of the main ridgeline of the mountain. This string would reside within a Class IV designated area but would be visible in the middle-ground zone from a Class II designated area to the west that coincides with Albion Valley and a scenic corridor associated with SH-77. When viewed from these aspects, the center string would be visible and change the character of the landscape. It would contrast with the surrounding landscape by matching neither color, form, line, or texture. Compounding this difference in landscape contrast is the increased sensitivity of the viewsheds due to relatively high public visibility from the residents of Albion and Malta, and motorists on both SH-77 and SH-81, resulting in a visual impact over the long-term.

The northern half of the center string would be visible from SH-81 and I-84. These roadways lie within scenic corridors with an increased sensitivity level due to the large number of people who would see the Proposed Project, and may result in an impact.

The east string could also be visible from the east along SH-81 and the community of Malta, Idaho. The community of Malta and SH-81 reside in a scenic corridor with increased levels of sensitivity due to the visibility from the roadway and the community residents. From this aspect, the towers would represent a direct impact over the long-term.

Under Alternative B, the west string and the South Access Road would be the most visible aspects of the Proposed Project from both the Howell Canyon road (Pomerelle Ski Area Access road) and SH-77 City of Rocks Backcountry Byway. This visibility would impact the background view from these areas, resulting in a visual impact over the long-term.

Alternative B calls for the expansion of the O&M building at the junction of SH-77 and the proposed South Access Road. There could be an impact to visual resources associated with this proposed expansion to the extent that the facility becomes larger and more visible from the Class II area associated with SH-77.

Improvements to the North Access Road could have impacts by making the road more visible from the scenic corridor associated with SH-81 and I-84. Approximately one-half mile of the road improvement would take place within the scenic corridor, which is sensitive to visual impacts due to the large number of people who may see the improved road.

Transmission interconnect lines would be visible from the north and east side of the Proposed Project area. The majority of the eastern transmission interconnect line would be parallel to the existing Raft River Transmission Line and match it, in both height and form. The north transmission interconnect line would be visible from I-84, pass over SH-81 and through its associated scenic corridor. The northern transmission interconnect line would be visible to motorists in this area, resulting in long-term visual impacts. The eastern transmission interconnect line would pass through a Class IV designated area. The eastern transmission interconnect line would be visible from the scenic corridor associated with SH-81, resulting in a long-term visual impact.

4.13.4 Alternative C

Construction Phase

Under Alternative C, short-term impacts to visual resources due to construction of the Proposed Project may occur due to the amount of vehicle and heavy equipment traffic associated with the Proposed Project. The number of truck trips necessary to complete the Proposed Project under this alternative would be 13 percent fewer than under Alternative B.

Impacts associated with construction of the North Access Road would be the same as described under Alternative B. Impacts from traffic and dust created by constructing the access road would be short-term.

Impacts associated with the visibility of cranes during construction would be similar to those described under Alternative B. Impacts under this alternative would be less than those described under Alternative B with fewer towers to be constructed, and the west string of towers closest to SH-77 would be eliminated.

Impacts from the construction of a transmission interconnect line would be similar to those described under Alternative B. Under this alternative there would be a single transmission interconnect line that would be 19.7 miles in length. There is over twice as many miles of new transmission interconnect lines proposed under this alternative compared with Alternative B. However, the majority (approximately 15 miles) of the interconnect line would parallel the existing Raft River Transmission line where the Proposed Project interconnect line parallels the Raft River line. There would be no new element added to the visual landscape.

Operational Phase

Under this alternative, facilities would be similar to those described under Alternative B. In comparison, there would be: 40 percent to 50 percent fewer towers, slightly fewer miles of new road, nearly twice as many miles of new transmission interconnect line, the turbine hubs would be 20 percent higher, and the turbine diameter would be nine percent to 30 percent larger. Under this alternative, the seven turbines proposed for the west turbine string under Alternative B would not be constructed but the center string would be about 1.5 miles longer. Under this alternative, the combined length of both turbine strings would be 14.5 miles with more space between each tower.

Impacts to visual resources from operation of the center string would be similar to those described under Alternative B. Under this alternative, the center string would be more visible from all directions, except the south where the string would be trimmed by 1.5 miles, due to the increased height of the towers and larger diameter of the turbines. Visual impacts to Albion Valley, SH-77, and SH-81 would be the same as described under Alternative B.

When viewed from the north, the Proposed Project would result in similar impacts to those described under Alternative B. By comparison, the Proposed Project would be more visible to motorists on SH-81 and I-84 due to a 1.5-mile extension to the north of the center string. Impacts to visual resources resulting from operation of the east string would be the same as those described under Alternative B. Under this alternative, the east string would be 1.25 miles shorter in length but the towers would be taller and the turbines would be larger. Impacts from the aspect of Howell Canyon Road and SH-77 City of Rocks Backcountry Byway would be less than those described under Alternative B due to the elimination of the west string. Compared to Alternative B, visual impacts would be further lessened due to the elimination of the hill cut below the telecommunication towers on the summit of Cotterel Mountain. Expansion of the O&M building and improvements to the North Access Road would have the same impacts as described under Alternative B.

Under this alternative, the northern transmission interconnect line would be eliminated. Impacts from the eastern transmission interconnect line would be similar to those described under Alternative B. By comparison, impacts from the eastern transmission interconnect line would be greater due to its increased length and proximity to I-84.

4.13.5 Alternative D

Construction Phase

Construction of the Proposed Project under this alternative would result in similar impacts to those described under Alternative B. Short-term impacts could result due to the amount of traffic associated with the Proposed Project. The number of truck trips necessary to complete the Proposed Project would be 33 percent less than under Alternative B.

Impacts associated with construction of the North and South Access Roads would be the same as described under Alternative B. Moderate impacts from traffic and dust created by constructing both the access roads would be short-term.

Impacts associated with the visibility of cranes during construction would be similar to those described under Alternative B. Impacts under this alternative would be less than those described under Alternative B since there are fewer towers to be constructed, and both the east and west strings of towers would be eliminated.

Impacts from the construction of a transmission interconnect line would be the same as those described under Alternative C.

Operational Phase

Under this alternative, facilities would be similar to those described under Alternative B. In comparison, there would be: 40 percent to 50 percent fewer towers, 27 percent fewer miles of Proposed Project roads, nearly twice as many miles of new transmission interconnect line, the turbine hubs would be 20 percent higher, and the turbine diameter would be nine percent to 30 percent larger. Under this alternative, there would be a single string of turbines 11.6 miles long.

Impacts to visual resources from operation of the center string and when viewed from the north would be the same as those described under Alternative C. Impacts associated with Howell Canyon Road and SH-77 City of Rocks Backcountry Byway would be less than those described under C. The center string of turbines would still be visible resulting in impacts, however the east string would not be visible due to its elimination under this alternative. When viewed from the California Trail KOP, impacts to visual resources would be less than those described under Alternative C. The center string of turbines would be visible and create a contrast in landscape form, however the east string would not be visible due to its elimination under this alternative. Expansion of the O&M building and improvements to the North Access Road would have the same impacts as described under Alternative B. Operation of the transmission interconnect line would be the same as those described under Alternative C.

4.13.6 Lighting and Dark-Sky Impacts

Sky glow refers to the cumulative impact from illumination coming from towns, cities, and other developed areas. It is the yellowish glow visible in the night sky when looking toward a nearby town or city. Sky glow can impact and degrade the visual quality of an area. It can also affect dark-sky activities such as recreational and scientific space observation.

As discussed in Chapter 2, it is anticipated that the Federal Aviation Administration (FAA) required lighting would consist of medium-intensity white lights flashing during daylight and twilight hours and red beacons flashing during all other hours. The use of such lights is common for structures exceeding 200 feet in height. During daylight, these lights are not expected to distract drivers or attract any more attention than the turbines themselves. During non-daylight hours and non-twilight hours, the lights would be apparent from the surrounding areas and would detract from the aesthetics of the night sky for those areas. The lighting of the turbines is not expected to create an abnormal distraction to drivers or produce other safety concerns.

At present, the Proposed Project area and immediately surrounding area are primarily dark at night. Existing light is generated from the lights of the residences and business in the towns of Albion and Malta, traffic safety lighting along I-84 north and east of the Proposed Project area, and lighting on cell phone and radio towers that are sited northeast of the of the Proposed Project. The flashing red lights associated with the Proposed Project would be operated during nighttime hours and would introduce a new element into the nighttime environment of the Proposed Project area. These lights would be limited in number, red and directional with little potential to create sky glow.

At the O&M facility and substation(s), outdoor night lighting would be required for safety and security. This lighting would be restricted to the minimum levels required to meet safety and security needs. All lights would be hooded and directed to minimize backscatter[6] and illumination of areas outside of the O&M and substation(s) sites. The O&M facility and substation(s) would create sources of light in areas where there are currently no light sources. Substation(s) lighting may not be visible from the communities in the vicinity of the Proposed Project due to shielding from vegetation and geologic features. Nighttime users of Cotterel Mountain would experience scattered views of the substation(s) lighting. The lighting of the O&M facility would potentially be visible to drivers along SH-77 as they approached Conner Summit while traveling both in a northerly or southerly direction. Because all lighting of the substation(s) and O&M facility would be hooded and directional, the potential of lighting to create sky glow is minimal.

4.14 HAZARDOUS MATERIALS

Information obtained during site observations, along with a review of regulatory agency data indicates that there are no hazardous substances within the Proposed Project area.

4.14.1 Alternative A (No Action)

Under Alternative A, no impacts related to hazardous materials would occur from the Proposed Project.

4.14.2 Alternative B

During construction of Alternative B, BMP would be used to avoid spills, leaks, or dumping of hazardous substances. The potential to cause unmitigated hazardous materials impacts that could result from Alternative B is considered to be low.

4.14.3 Alternative C

The impacts under Alternative C would be the same as discussed under Alternative B.

[6] backscatter refers to the reflection of light back toward the ground by moisture or dust in the atmosphere.

4.14.4 Alternative D

The impacts under Alternative D would be the same as discussed under Alternative B and Alternative C.

4.15 FIRE MANAGEMENT

Impacts to fire and fuels could occur during the construction and operation phases of the Proposed Project. For purposes of this assessment fire management includes: suppression, wildfire use, and fuels management. The analysis takes into account guidance provided in the Cassia RMP and the Fire, Fuels, and Related Vegetation Management Direction Plan Amendment and Draft EIS (U.S. Department of Interior (USDI), BLM 2004a).

4.15.1 Alternative A (No Action)

Under Alternative A, the ability of fire management to suppress wildfire and manage surface fuels within the Proposed Project area would not be affected. Fire frequency and intensity would not be changed by Alternative A.

4.15.2 Alternative B

<u>Construction Impacts</u>

The risk of human caused ignitions in the Proposed Project area would increase slightly over the short-term as a result of road construction and improvement projects. Operation of heavy machinery and work crews in the Proposed Project area would increase the possible sources of ignition during road construction. The miles of new roads constructed and number of truck trips necessary to build Proposed Project roads would be highest under this alternative.

Construction projects associated with towers, substations, and other structures would also slightly increase the risks of human caused ignitions in the Proposed Project area. Welding, or other fabrication activities that produce sparks would pose the highest risks. Operation of heavy machinery in the Proposed Project area could also increase ignition potential. The number of substations would be highest under this alternative. The number of truck trips necessary to construct turbines, substations, and other facilities would also be the highest under this alternative.

In the event of an ignition in the Proposed Project area, the presence of construction crews and equipment could pose a moderate hazard to fire suppression crews. Limited access to the Proposed Project area may cause traffic congestion (vehicle and radio) that could increase safety hazards and response times as construction crews evacuate the area, and suppression crews enter. Traffic congestion could lead to more acres burned from wildfire. Additional hazards to suppression crews include any machinery or vehicles left behind by construction crews, overhead hazards (i.e., towers, transmission interconnect lines, substations, etc.), and hazardous materials.

Operational Impacts

Operation of constructed and improved roads could have impacts to fire management. New and improved roads would provide increased access to the area. The public may be more likely to visit the Proposed Project area as a result of the increased access, increasing the probability for human caused ignitions; however, in the event of an ignition, suppression crew response times in the Proposed Project area could decrease with better roads, resulting in fewer burned acres. Impacts could result from the fuel breaks created by new and improved roads in the Proposed Project area. Roads provide a fuel break that may stop or slow the spread of fire, resulting in smaller fires over the long-term.

The presence of towers, turbines, substations and transmission interconnect lines may limit the suppression strategies in the event of a wildfire. Engine and hand crews would experience impacts from increased overhead hazards while air attack crews would experience flight hazards. The presence of towers along the ridgeline could decrease the availability of potential helicopter landing sites. These limitations would likely cause suppression forces to use indirect tactics, resulting in more acres being burned.

The towers would effectively increase the lightning-attractive area on Cotterel Mountain. The probability of lightning striking an object is found by multiplying the lightning-attractive area of the object by the local ground-flash density (lightning strikes to ground per unit area, Hasbrouck 2004). This may have an influence on the number of lightning caused fire starts in the area.

Electrical trenching could impact fire suppression crews by hampering their ability to contain a wildfire fire by creating a fire line. Fire line created by earth moving equipment such as bulldozers may not be appropriate where electrical trenching exists. This could limit suppression actions, resulting in more acres burned. Impacts from electrical trenching could be realized during fire rehabilitation operations. Rangeland drills, or other heavy equipment that is sometimes used during the emergency stabilization and rehabilitation process may not be appropriate in the vicinity of an electrical trench. The most miles of electrical trenching are proposed under this alternative.

The presence of towers, wind turbines, and substations along the ridgeline could have an impact on communications to the extent that they could scatter radio signals used by fire line personnel to communicate during fire management activities.

4.15.3 Alternative C

Construction Impacts

Compared to Alternative B, the potential for ignitions during road construction and improvement would be less due to fewer miles of roads constructed and fewer truck trips necessary to complete Proposed Project roads. The presence of construction crews and equipment during suppression activities would have the same impacts described under Alternative B.

Operational Impacts

Operation of constructed and improved roads would have impacts to fire management associated with new and improved roads acting as potential fuel breaks. By comparison, fewer miles of roads would be constructed resulting in fewer impacts than under Alternative B.

Under this alternative, there would be fewer towers, turbines, and substations resulting in less widespread impacts, and slight reduction of the lightning-attractive area within the Proposed Project boundary. Also, fewer miles of trenching are proposed under this alternative, so the impacts would not be as widespread as Alternative B. Fewer structures would be constructed under this alternative, resulting in fewer impacts to communications during fire management activities.

4.15.4 Alternative D

Construction Impacts

The potential for ignitions during road construction and improvement would be less under Alternative D than either Alternative B or Alternative C, due to fewer miles of roads constructed and fewer truck trips necessary to complete Proposed Project roads. Also, one fewer substation would be constructed and the number of truck trips necessary to complete the Proposed Project would be fewer, resulting in less of an impact than either Alternative B or Alternative C. The presence of construction crews and equipment during suppression activities would have the same impacts described under Alternative B.

Operational Impacts

Operation of constructed and improved roads acting as potential fuel breaks would have fewer impacts to fire management than Alternative B or Alternative C, due to fewer miles of roads. Impacts associated with possible increased ignitions from visitors and impacts associated with increased access for fire suppression crews would be slight. Under this alternative, there would be fewer towers, turbines, and substations resulting in less widespread impacts and a slight reduction in probability of ignitions due to lightning strikes.

4.16 CUMULATIVE EFFECTS (IMPACTS)

4.16.1 Physical Resources

Air Quality

Current resource uses, such as grazing and recreation, would continue to be the primary foreseeable uses for the area. In the past, these as well as other uses in the area including: highway construction projects, agriculture, changes in fuel loads and altered fire regimes; prescribed burns to treat vegetation; and wildfire have affected air quality, resulting in the current status. Based on current state and federal air quality regulations associated with these types of impacts, this action is not likely to affect air quality appreciably in the future.

Geology

Current resource uses, such as grazing and recreation, would continue to be the primary foreseeable uses for the area. In the past, structures and roads built for access, may have affected the geology of the area, resulting in the current status. There are no other projects in the foreseeable future that would require drilling or blasting; therefore, geologic resources are not likely to be affected appreciably in the future. However, future ROW could be granted that require drilling or blasting. It is expected that geologic hazards would be avoided by all development projects wherever feasible. Therefore, cumulative impacts to or from geologic hazards would be negligible for the Proposed Project.

Soils

Current resource uses, such as grazing and recreation, would continue to be the primary foreseeable uses for the area. On Cotterel Mountain the existing roads, the communication site at the summit, and stock pond developments have all resulted in past and ongoing ground-disturbance. Other uses in the area including agriculture, changes in vegetation composition and the spread of invasive weed species have also affected soils. In the future, additional ROW that include ground-disturbing activities could be granted. Overall, the estimated cumulative impacts to soil resources would be expected to be negligible.

Water Resources

Past projects including road development, the communication site development, and other ground-disturbing activities may have impacted water resources in the area. The Proposed Project would use BMP to avoid impacts to 303(d) listed streams and other water resources. If future ROWs are granted that allow ground-disturbing projects, BMP will also be applied. Therefore, cumulative impacts to water resources are not expected.

Noise

Past projects including road development, the communication site development, and other projects using heaving machinery may have impacted noise levels. No other reasonably foreseeable projects in the vicinity of Cotterel Mountain have been identified that would result in noise impacts to residence or recreational users. The Proposed Project is not expected to impact noise levels, therefore, no cumulative noise impacts are anticipated.

4.16.2 Biological Resources

Vegetation

Historical impacts to vegetation that have occurred within the Cassia-Raft River Creeks and Marsh Creek sub-basin include: construction of I-84; livestock grazing; vegetation treatments; rural development; agricultural development that removed shrub steppe habitat; wildfire and prescribed burning; construction of transmission lines; livestock water developments; and removal of riparian vegetation. Cumulative impacts on vegetation resources could occur through increased loss and alteration of habitat, as well as long-term affects from changes in grazing and fire regimes. Cumulative impacts of the Proposed Project include, reduced habitat and forage for livestock and wildlife, and possible increased populations of invasive species and noxious weeds.

Big Game

Historical cumulative impacts to big game that have occurred within the Cassia-Raft River Creeks and Marsh Creek sub-basins include: construction of I-84; livestock grazing; rural development; agricultural development that removed shrub steppe habitat; wildfire and prescribed burning; construction of transmission lines; livestock water developments; mining; water channel alterations and removal of riparian vegetation; and hunting.

Existing and foreseeable impacts to wildlife occurring within the Cassia-Raft River and Marsh Creek sub-basins include: public access, livestock grazing; continued alteration of streams for human purposes; mining; rural development; wildfire and prescribed burning; and alteration of shrub steppe habitats.

Disturbance within big game habitat on and in the vicinity of Cotterel Mountain is anticipated. Livestock use on Cotterel Mountain is anticipated to be minimally affected by the proposed actions. Mule deer use on Cotterel Mountain could be altered due to increased human access. The Idaho Transportation Department is proposing to reconstruct a portion of the City of Rocks Back County Byway between Elba and Almo, Idaho. This 17-mile stretch of road would be built in phases with completion of the Proposed Project occurring in 2007 or 2008 (Jones 2004). Completion of this road reconstruction project could likely result in an increase in the number of visitors to the City of Rocks area and an increase in motor vehicle speeds along this section of road. This could result in an increase in mortality to big game as a result of an increase in wildlife vehicle collisions. Indirect impacts to big game such as those related to noise and human disturbance (i.e. displacement), are difficult to quantify, but probably would increase the overall level of cumulative impacts to big game habitat, over the long-term.

Amphibians and Reptiles

Regional cumulative impact to amphibian and reptile habitats and individuals include roads (e.g., federal and state highways, primary and secondary roads), future ROW authorizations, wildfire and vegetation management treatments. These disturbances would be expected to be scattered throughout the region, and probably would result in negligible impacts to amphibian and reptile populations. By implementing prompt revegetation and appropriate habitat protection measures following construction, cumulative impacts to amphibian and reptile populations within the region would be expected to be negligible. However, increased vehicle speeds and traffic in the Proposed Project area may increase roadway mortality of reptiles.

Small Mammals

Regional cumulative impact to small mammal habitats and individuals include roads (e.g., federal and state highways, primary and secondary roads), future ROW authorizations, and vegetation management treatments. It would be expected that these disturbances would be scattered throughout the region, and probably presents a negligible impact to small mammal populations. By implementing prompt revegetation and appropriate habitat protection measures following construction, cumulative impacts to small mammal populations within the region would be expected to be negligible. However, potential increased vehicle speeds and traffic in the Proposed Project area may increase roadway mortality of small mammals.

Birds and Bats

Lack of data quantifying the status of local passerine and bat populations in the area make the assessment of cumulative impacts to birds and bats difficult. In the U.S., domestic cats, collisions with vehicles, buildings and windows, and communication towers each kill over one million birds every year, while all of the operating wind projects in 2001 were estimated to kill 10,000 to 40,000 birds per year (Erickson *et al.* 2001b), roughly 80 percent of which are passerines.

The level and sources of bat fatalities from human-induced causes are less well known, but bats are known to have collided with buildings and other tall structures, but less frequently than birds. Recent evidence indicates that wind turbines can kill bats, especially those species which migrate south for the winter. Bats are long-lived and produce few (usually one) young per year, which means that their populations could not recover as quickly from losses as could many birds that can produce many young per breeding cycle. Little is known about bat migration routes, corridors, or populations. However, the number of operating wind projects is expected to increase in the future.

Raptors

It is generally assumed that regional populations of common raptors are widely distributed and stable (Olendorff 1973; Newton 1979). During spring, Raft River Valley-Curlew National Grassland Globally Important Bird Area (GIBA) located to the east and south of the Proposed Project area contains the highest breeding population of ferruginous hawks in Idaho. Other than impacts from natural events, this population has been relatively unaffected for the past 30 years. Past and current levels of disturbance and actions have not appeared to impact productivity to a large degree within the GIBA. Raptors displaced by the Proposed Project could move to other territories if suitable unused habitat is available. Given the anticipated collision rates, local or regional cumulative impacts are not expected from the Proposed Project.

Threatened or Endangered Species

No past, present or reasonably foreseeable projects in the vicinity of Cotterel Mountain have been identified that would potentially affect bald eagle or gray wolf. There are several other wind power projects proposed in southern Idaho. These projects, if constructed within suitable habitat for either bald eagle or gray wolf could have the potential to impact these species. However, bald eagle fatalities at existing wind plants are rare to nonexistent. Gray wolf populations in Idaho continue to increase even with authorized and unauthorized removal of individuals due to predation. No cumulative impacts to gray wolf would be expected to occur.

Greater Sage-grouse

It is generally assumed that regional populations of sage-grouse have been declining as a result of: habitat loss or fragmentation from invasive species; agriculture; degradation due to fire; grazing; urbanization; hunting and poaching; predation; disease; weather; accidents; herbicides; and physical disturbance (Connelly *et al.* 2004).

Historical impacts to sage-grouse that have occurred in the Proposed Project area and its vicinity include: conversion of native vegetation to agricultural; wildfire; prescribed burns; construction of I-84 and Interstate 86 (I-86); construction of other roads; livestock grazing, water development, and fencing on private or public lands; rural development; construction of transmission lines; mining; water channel alterations; drought; hunting; and disease.

Future projects and anticipated natural events that could affect sage-grouse in the Proposed Project area and its vicinity include: continued livestock grazing, water development, and fencing on private or public lands; continued rural development; loss of shrub steppe habitat on private lands; potential wildfire; drought and severe winters; hunting; and disease.

In Idaho, recent population trends show an estimated statewide decline of 40 percent from the long-term average (IDFG 1998). The average number of chicks produced per hen has declined by 40 to 50 percent in many areas (Connelly *et al.* 2004). At least six sage-grouse leks are currently active or occasionally active on Cotterel Mountain. In 2003, the estimated population of sage-grouse on Cotterel Mountain was approximately 70 birds (TBR 2004). Within the Proposed Project area and its vicinity lek attendance trends over the last ten years have been flat. For the ten years prior to this period, there were declining lek attendance trends.

Statewide it is estimated that there are 772 active leks and 5,684,900 acres of key sage-grouse habitat. If the Proposed Project results in the abandonment of all six known sage-grouse leks on Cotterel Mountain this would represent less than a one percent (0.008%) loss to the total number of leks state-wide. Under the proposed action (Alternative B), which would result in the largest project footprint, it is estimated that sage-grouse could potential be displaced from about 26,644 acres of suitable habitat on Cotterel Mountain. This displacement from potential suitable habitat would represent less than one-half percent (0.005%) loss to the total estimated acres of suitable sage-grouse habitat state-wide.

In the Proposed Project area and its vicinity, it is estimated that there are 20 active leks and 142,927 acres of key sage-grouse habitat. If the Proposed Project results in the abandonment of the six known sage-grouse leks on Cotterel Mountain, this implies an approximate 30 percent loss to the total number of leks in the area. Under Alternative B, displacement from potential suitable habitat would represent approximately a 19 percent loss to the total estimated acres of potential suitable sage-grouse habitat from the Proposed Project area and its vicinity.

Cumulative impacts on sage-grouse could occur through: increased loss or alteration of habitat; increased access; agriculture; urbanization; hunting and poaching; predation; disease; herbicides; land exchanges, as well as the development of energy resources. Past and present uses of the Proposed Project site and surrounding areas have altered vegetative composition and community dynamics (fire frequency and severity, soil structure and function, nutrient cycling, etc.), or converted sagebrush communities to agriculture or development purposes, resulting in loss of habitat.

The construction of the Proposed Project, in conjunction with the development of other energy or land conversion projects within potential sage-grouse habitat, could have additive impacts by decreasing region-wide habitat. The continuing loss and fragmentation of sagebrush habitat has reduced the number of potential sites were sage-grouse are found; therefore, impacts to the remaining sage-grouse populations are multiplied when occupied habitat is affected. Future actions that continue this trend would result in a reduced population of sage-grouse.

4.16.3 Historical and Cultural Resources

The Proposed Project, in conjunction with other past projects or planned projects in the area, would result in ground disturbance that could potentially impact identified and unidentified prehistoric or historic sites, as well as cause impacts on traditional cultural properties. If surveys were conducted prior to construction of these unknown future projects, the location of these resources would be identified so impacts could be avoided to the extent possible. Implementation of mitigation programs in each individual project should help to limit project-specific impacts, therefore reducing overall cumulative impacts on cultural resources.

Cumulative effects on cultural resources can also occur through natural erosion and weathering of lands containing archaeological sites. Cumulative impacts of the Proposed Project may include the disturbance and loss of unidentified cultural resources that could increase knowledge about past use of the area or an increase in visitation that may result in vandalism to the archaeological resources. Cumulative impacts may also result from gain in scientific discovery of new sites identified by construction and maintenance crews and the general public due to an expected increase in visitation to the area.

4.16.4 American Indian Concerns

As of the publication of the Draft EIS, no sites of concern have been identified.

4.16.5 Socioeconomics

Currently there are no other future foreseeable projects within the Cassia-Minidoka socioeconomic analysis area that when added to past actions and the Proposed Project would result any measurable cumulative affects.

4.16.6 Lands and Realty

Cumulative effects to land use issues are not expected from the Proposed Project, past actions, or future foreseeable actions.

4.16.7 Recreation

Past BLM management, road and trail building activities, and the development of other recreation amenities have contributed to increase recreation opportunities and accessibility in the vicinity of Cotterel Mountain. In addition, the Idaho Transportation Department is proposing to reconstruct and pave a portion of the City of Rocks Back County Byway between Elba and Almo, Idaho. Completion of this road reconstruction project could likely result in an increase in the number of visitors to the City of Rocks area. Increased visitation to the City of Rocks could result in a rise of visitor use of Cotterel Mountain. At periods of high use, the campgrounds at the City of Rocks are often full. Visitors that do not obtain a campsite may search for appropriate dispersed camping sites in the vicinity of the City of Rocks, which could include Cotterel Mountain. An increase in dispersed camping could result in localized disturbances to wildlife, vegetation and soils.

Nationwide the popularity of OHV use has been increasing (Motorcycle Industry Council 2003). A representative increase in off-highway motorcycles and ATV use would also be expected at the local level. The potential for the Proposed Project in combination with past projects and future foreseeable projects would not likely have cumulative impacts to the current ROS designation of semiprimitive motorized.

4.16.8 Livestock Grazing

Cumulative impacts could include increased concentration of livestock use, rangeland deterioration, and altered fire regimes. Construction on Cotterel Mountain would disturb vegetation and soil and create an environment that is susceptible to noxious weeds and invasive species establishment. If these species increase and become more dominant, they can alter the spatial distribution of livestock grazing. As key forage species (bluebunch wheatgrass and Idaho fescue) are replaced by invasive species that are less palatable (cheatgrass and bulbous bluegrass), livestock would begin to use those sites less and concentrate in areas with better forage (Bailey 1995). Concentrated livestock grazing can increase the mechanical effects on the soil, including hoof sheer and soil compaction, which could lead to further spread of invasive species, and decrease native reestablishment and the overall foragability of the site (Bailey *et al.* 1996).

In addition, the spread of invasive species and the construction of the road systems could alter fire patterns. Based on the historic species composition and distribution on Cotterel Mountain, fire occurrences have primarily been low frequency, fire return intervals between 40 to 60 years (Marquez 2004), low intensity mosaic burns. As invasive species populations increase, fuel loads within the system are augmented, which increases the probability and intensity of fire within the area. Constructed roads also affect the distribution of fire by acting as firebreaks. In doing so, natural fire patterns could be altered to produce more frequent, high intensity homogeneous burns. This could have positive affects by altering sagebrush or juniper/mountain mahogany to grasslands, but it would also cause the suspension of use on AUMs associated with fire rehabilitation projects.

4.16.9 Visual Resources

Past and current projects have created the existing visual conditions in the Cotterel Mountain area. The Proposed Project would have a cumulative impact on the visual resource. Each of the action alternatives would have varying degrees of impacts to visual resources beyond the Proposed Project area by failing to maintain the existing character of the landscape.

No other planned projects are expected to occur in the immediate area surrounding the Proposed Project, except for improvement projects for range and wildlife. Such improvement projects would not contribute to the cumulative impact on the visual resource.

Several other wind power projects are proposed for southern Idaho along the Snake River Plain. If these projects are constructed, wind turbines would become a more common sight in southern Idaho. Residents and frequent visitors to the region could view the turbines of one or more wind power projects in a single day. Over time, they would likely experience repetitive views of wind turbines through their local travels over a period of time. Consequently, some local residents and those traveling through the area might perceive a change to the overall character of the Snake River Plain landscape.

4.16.10 Hazardous Materials

The Proposed Project and future foreseeable projects in the area would be required to use BMP to avoid impacts to the environment from hazardous materials. When combined with past actions, there would not be any cumulative impacts due to hazardous materials.

4.16.11 Fire Management

The Proposed Project would have cumulative impacts by reducing the tools available to resource managers to treat surface fuels on district efforts to meet fuel reduction targets set by the National Fire Plan. This impact could extend beyond the boundary of the Proposed Project area by increasing the risk of large fires that may spread beyond the Proposed Project area boundary. Prescribed fire use may no longer be an acceptable method to achieve resource objectives in and adjacent to the Proposed Project area. The presence of the Proposed Project could increase the complexity of developing a prescription to the point where it would not be feasible.

Cumulative suppression impacts could occur due to the hazards associated with wind farm infrastructure. Aerial suppression resources would not be appropriate due to turbine towers. Engine and hand crews would experience increased overhead hazards in the Proposed Project area. Construction of the Proposed Project would likely limit suppression within and adjacent to the Proposed Project area to indirect tactics in the event of a wildfire, resulting in larger fires in the Cotterel Mountain area. Larger fires may be either beneficial or harmful depending on the fuel type burned.

4.17 UNAVOIDABLE ADVERSE EFFECTS

The Proposed Project design features, BMP, and compensatory off-site/mitigation would avoid or minimize many of the potential adverse effects. However, not all adverse effects can be avoided, nor would mitigation 100 percent effective in remediating all impacts. There would be at least a minimal amount of unavoidable adverse impact on all resources present in the Proposed Project area for at least a short time, due to the presence of equipment and humans in the area and the time necessary for restoration to be effective. Unavoidable impacts associated with the Proposed Project would include:

- Soil compaction for road construction.
- Loss of vegetation.
- Loss of mule deer winter range.
- Potential impacts to birds and bats.
- Potential impacts to sage-grouse and their habitat.
- Loss of livestock forage.
- Changes to the viewshed of the Cotterel Mountain ridgeline from siting wind turbines and construction of roads.
- Visual alternation of the nighttime environment due to turbine lighting.
- Potential loss of aerial fire fighting options along the Cotterel Mountain ridgeline.

4.18 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible and irretrievable impact is defined as a permanent reduction or loss of a resource that once lost cannot be regained. Most energy development projects, such as gas, oil, or coal fire plants, result in an irreversible and irretrievable commitment of the power-generating resources (fuel). Wind is a renewable resource that would not be depleted or altered by the Proposed Project and could offset the need to consume fossil fuels.

The loss of productivity (i.e., forage wildlife habitat) from lands used for the siting of the Proposed Project features (i.e., turbines roads, substations) would be an irreversible and irretrievable commitment of habitat resources for wildlife species, such as sage-grouse, dependent upon mature shrub-steppe plant communities. These vegetation communities may take 20 to 40 years or more to recover following decommissioning of the Proposed Project. Therefore, the majority of the land disturbed by the Proposed Project would not be returned to useful production for up to 50 to 70 years, if the Proposed Project does not go beyond 30 years.

There would be an irreversible and irretrievable commitment of the energy used during manufacture of the turbine and other Proposed Project components as well as during construction, drilling, production, and restoration associated with the Proposed Project. Foundations or other facilities greater than six inches below ground surface would be permanent and abandoned in place. They cannot be recovered due to practical or economic considerations and they would be irreversibly and irretrievably committed.

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