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 Final 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 the Cotterel Wind Power Project (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 will be determined in the plan of development. Therefore, the exact areas of impact to specific resources are estimates based on the best available information.

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 and are analyzed in Section 4.16 of this document.

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, grazing, and siting of communication facilities at the mountains summit.

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. In addition, blasting for road construction and turbine foundations would release fugitive dust and small amounts of CO and NOx. 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

During operation of the facility, the maintenance of the turbines would require changing of turbine oil, cooling fluids and grease, all of which could release minor amounts of VOCs. These activities would be of limited duration and would be expected to dissipate quickly with no local or regional effects. Therefore, the operation of the Proposed Project would not impact air quality.

Alternative C

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

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, transmission interconnect lines 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, auguring for the transmission interconnect line poles and road construction. Construction activities from Alternative C would be less than those discussed under Alternative B because there would be less blasting and construction due to the placement of fewer turbines and fewer miles of road. There would however, be a greater number of holes augured for the placement of the transmission interconnect line poles.

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 be 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%) 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 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.

The transmission interconnect lines would result in a small surface impact to soils at the base of each H-frame pole. These disturbed areas would be revegetated according to BMP outlined in Appendix C.

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 soils in the Proposed Project area. Following construction, between approximately 134 to 147 acres would be reclaimed, resulting in about 203 acres (2%) 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%) depending upon which turbine is selected. Permanently disturbed acres would be about the same for both turbine sizes of about 158 acres (<1.5%) 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

Under Alternative B, 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 necessary for construction of the Proposed Project would come from a permitted private or municipal source outside the Proposed Project area. Since the source or volume of water needed for construction is unknown at this time, the potential impacts from its use cannot exactly be determined. However, since the use of off-site water for construction would be temporary and short-term, any potential impacts would be expected to be slight and localized in nature.

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. The only surface flow that would be affected by construction of the Proposed Project under Alternative B is Summit Creek. Reconstruction of the south access road under Alternative B would require the replacement of the existing culvert and the removal of a small amount of riparian vegetation. However, because construction activities would be required to follow BMP including erosion control and soils management techniques it would be unlikely that sediment would be delivered to Summit Creek or to any 303d listed streams. These BMP would be employed during construction, O&M, and decommissioning. 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 no impact to water resources in the Proposed Project area. The transmission line proposed in Alternative C would cross the North and South Side Canals, part of a wetland west of Lake Walcott and the Snake River. However, no transmission line poles would be sited in any of these water features or waters of the United States (Snake River) and no impact would be expected.

Alternative D

Construction activities from Alternative D would approximate those for Alternative B and Alternative C, and would also be expected to have no impact to water resources in the Proposed Project area. The transmission line proposed in Alternative D would cross the North and South Side Canals, part of a wetland west of Lake Walcott and the Snake River. However, no transmission line poles would be sited in any of these water features or waters of the United States (Snake River) and no impacts would be expected.

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 affected 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.

Noise from the high-voltage overhead transmission lines and distribution lines is generated by electrical discharge activity resulting in a characteristic crackling sound. Noise from corona discharge

caused by water droplets cannot be avoided. This noise consists of a crackle that is often accompanied by a low-frequency (100Hz) hum.

Noise from operation of substations results in two sources of audible noise: transformer noise and switchgear noise. Transformer noise consists of a constant low-frequency hum at about 100 Hz. Switchgear noise is generated by the operation of circuit breakers used to break high-voltage connections. An arc formed between the separation contacts has to be "blown out" using a blast of high-pressure gas resulting in a short duration but loud sound.

Alternative A (No Action)

Under Alternative A, existing background noise levels on Cotterel Mountain and its 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. The transmission interconnect lines would not pass close enough to any residents or other sensitive receptors for the crackle and low-frequency hum generated by electrical discharge to be audible.

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. Recreational users would also hear the crackling and hum from the electrical discharge from the transmission interconnect lines as well as the hum and air blast from the substation switchgear. Recreational users would only hear these sounds if when in close proximity to either the transmission interconnect lines or the substations.

Alternative C

Under Alternative C, impacts from noise as a result of construction and operational activities would be similar to Alternative B. Under Alternative B, there would be only one transmission interconnect line and one substation. As a result, there would be few opportunities for recreational users to be exposed to the sounds generated by these project features.

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. Impacts from the transmission interconnect lines and substation would be the same as Alternative C.

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 Summit 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, turbines, substations, and the transmission interconnect lines 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, restrict 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 decreased fire return intervals (Peters and Bunting 1994; Whisenant 1990). The compilation of decreased 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 as well as 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; and grasslands (Table 4.6-1). Agricultural land, aspen communities, and open water sites would not be affected by this alternative.

Riparian community types would be impacted by the crossing of the Snake River by the transmission interconnect line. Russian olive and some small cottonwood trees would need to be removed to facilitate the siting of the wooden H-frame pole structures to support the transmission interconnect line as it crosses the Snake River. The cleared vegetation would be expected to reestablish itself within three to five years following construction.

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 successful 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; and grasslands (Table 4.6-1). Agricultural land, aspen communities, and open water sites would not be affected by this alternative.

Impacts to riparian vegetation would be the same as those described under Alternative C.

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 (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 (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 ridge 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%), 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 of 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

Site selection is the best recommended method to avoid bird and bat fatalities. Wind power project sites should be selected that have low habitat diversity, low species diversity, low numbers and abundance of bats and birds and should avoid areas with special status species such as rare or federally protected species (USFWS 2003). The Cotterel Mountain site has high biodiversity in both habitat and species, supports sage grouse leks, is adjacent to a designated Globally Important Birding Area, and provides big game winter range. Therefore, methods other than site selection would be used to manage the bat and bird fatalities that could occur as a result of the Proposed Project. The primary method for decreasing bird and bat fatalities at the Cotterel Mountain site would be the application of adaptive management (See Section 2.5.4).

Wind power projects may have effects on wildlife, particularly avian species and bats, depending upon the location, geography, and natural setting of the project site. In the context of other sources of avian mortality, it does not appear that wind power is responsible for large numbers of bird deaths (USGAO 2005). While we do not know a great deal about relative impacts of bat mortalities relative to other sources, significant bat mortality from wind power has occurred in Appalachia (USGAO 2005). Long-term effectiveness monitoring of the Proposed Project (five years or greater) will assist in understanding the relationships between the Proposed Project design, and operation of the facility and its 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 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 creates 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 (Erickson, et. al., 2004).

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 would eliminate the possibility of the "gauntlet" effect on birds and bats in the future.

Understanding how a wind power generating facility functions facilitates an understanding of 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 generating at full capacity or not turning at the same time. Each turbine operates as a single entity; some may generate more electricity and others only less 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 (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 turbines rotor swept area, 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.

Alternative A (No Action)

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

Alternative B

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 should not result in any direct or indirect impacts to western small-footed myotis.

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.

Alternative C

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

Alternative D

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

Birds

Based on the results of fatality monitoring at other wind plants throughout the west, the degree of collision risk to birds at wind plants appears to be species-specific. 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 selection of a wind power project site in specific types of habitat, number and diversity of birds in the area, and the behavior of an individual species plays a large role in its risk of collision (USFWS 2003). 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).

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 (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 Year-long 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 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 (Erickson et. al., 2002). 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.

Nesting Raptors

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 Proposed 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 (TBR 2004).

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 known golden eagle nest locations.

Based on the 2003 raptor nest survey, the closest ferruginous hawk nest would be located over one mile from the Proposed Project construction under Alternative B. Therefore, ferruginous hawks nesting along the lower portions of the east slope of Cotterel Mountain would likely not be affected by the construction or operation of the project under Alternative B.

Other nesting raptor species including red-tailed hawk, Swanson's hawk, northern harrier, sharp-shinned hawk, prairie falcon, and owls nest closer to areas that would be under construction under Alternative B of the Proposed Project. If construction is started prior to these species initiating nesting, they would either find alternative nest sites, not nest, or habituate to the increased activity and nest as normal. If construction is started after nesting has been initiated then these species could be displaced from their nests during the construction period under Alternative B. The operational phase of the Proposed Project could result in reduced number of raptors nesting on Cotterel Mountain.

Alternative C

The impacts of Alternative C would be similar to that of Alternative B. However, under Alternative C, the transmission interconnect line would pass directly adjacent to two ferruginous hawk nests located along the existing Raft River transmission line (Figure 3.2-7). Construction of the transmission interconnect line in the vicinity of these nest sites during the nesting season would potentially result in abandonment of the nest by these birds. The operation of the transmission interconnect line would not impact nesting ferruginous hawks.

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

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.

Under Alternative D, potential project impacts to ferruginous hawks would be the same as those described under Alternative C.

Waterfowl, Shorebirds, and Waders

Alternatives B, C, and D.

This group of species is not expected to be measurably affected by any of the Proposed Project alternatives, because only limited suitable habitat is present within the Proposed Project area. On Cotterel Mountain only a very few migrants of this group were observed during on-site avian surveys (TBR 2004). There would be the potential for migrating individuals from this group to occasionally pass over Cotterel Mountain. 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.

Alternatives C and D

Birds in this group have been know to collide with transmission or other utility lines that cross their flight paths. Potential impacts Under Alternative C and Alternative D to this group of birds would be focused along the Snake River where the transmission interconnect line would cross the river. However, the proposed crossing site of the Snake River for the transmission interconnect line is directly adjacent to two existing transmission lines. The proposed third transmission line could result in an increased opportunity for waterfowl collisions with the transmission lines. As discussed in Appendix D, the portion of the transmission interconnect line that crosses the Snake River would be appropriately marked to aid in its visibility to waterfowl and other birds that use this area. This would help to reduce the impact to this group of birds as a result of potential collisions with the transmission interconnect line.

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 (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.

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 megawatt (MW). These three ranges were used based on the findings of the wildlife working group of the National Wind Coordinating Committee (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 0 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 rights-of-way (ROW) for the Proposed Project are granted. As a result, the Proposed Project requires 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 golden 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 majority of golden eagles killed at Altamont were non-breeding adults and subadults termed "floaters." These are birds that are looking 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. Sharp-tailed grouse could migrate through the Proposed Project area and potentially collide with operational turbine blades.

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. These species could migrate through the Proposed Project area and potentially collide with operational turbine blades.

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.

American white pelican and black tern nest on the Minidoka National Wildlife Refuge and may use the flight space over Cotterel Mountain during feeding or migration flights. American white pelican have been observed on the Snake River in the vicinity of the transmission interconnect lines proposed crossing location. American white pelican have been know to collide with transmission or other utility lines that cross their flight paths. However, the proposed crossing site of the Snake River for the transmission interconnect line is directly adjacent to two existing transmission lines. Therefore, the transmission interconnect lines proposed under Alternative C would not result in a measurable increase in potential mortality to the American white pelican. Based on the low number of historic observations and lack of habitat, these species are not likely to occur on the Cotterel Mountain, and would not likely be impacted by this portion of the Proposed Projects construction or operation.

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.

Under Alternative D, potential impacts to American white pelican and black tern would be the same as those discussed under 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 actual 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 (IWETT 2004).

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, Idaho Sage-grouse Advisory Committee, 2005). 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 Final BLM Programmatic Wind Energy Development EIS (USDI BLM 2005) discusses a number of construction activities that may adversely affect wildlife (sage-grouse). These include: (1) habitat reduction, alteration or fragmentation, (2) introduction of invasive vegetation (3) injury or mortality of wildlife, (4) decrease in water quality from erosion and runoff, (5) fugitive dust, (6) noise, (7) exposure to contaminants, and (8) interference with behavioral activities.

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 the 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, USFWS 2003, Idaho Sage-grouse Advisory Committee, 2005). If birds are displaced, it is unknown whether, in time, local populations may become acclimated to elevated structures and return to the area.

Another 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) and Connelly *et. al* (2004).

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).
- 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).

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).
- 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).

- As the distance increased from the source of noise, the number of leks with reduced attendance decreased (Braun et al. 2002.
- Female sage-grouse were found to move greater distances from leks near noise disturbances, and has lower rates of nest initiation in areas disturbed by vehicle traffic (Lyon and Anderson 2003).

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).

Alternative A (No Action)

Alternative A would not have 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 operation activity and increased public access.

A slight increase in sage-grouse mortality could result from collisions with wind turbines, transmission interconnect lines, and vehicles. 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 elevation migrations), it is unlikely that these collisions would be numerous or result in an impact to the Cotterel Mountain population. 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, however, it is assumed that maintenance personnel would be trained to be sensitive to the presence of sage-grouse and drive slowly to prevent collisions.

Sage-grouse have an extreme fidelity to their lek sites. Due to this fidelity, sage-grouse on Cotterel Mountain would likely continue to attempt to use leks in the vicinity of the Proposed Project following its construction. New birds added to the Cotterel Mountain sage-grouse population would likely be displaced by the Proposed Project to existing leks and habitat in the surrounding area if available.

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, under Alternative B, it could be assumed that all 26,644 acres of potential sage-grouse habitat within 1.8 miles of the Proposed Project area could be affected (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**

Alternative C

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 be similar to those described under Alternative B.

Under Alternative C, sage-grouse could be displaced from 23,977 acres of potential habitat from the area within 1.8 miles of the Proposed Project. 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.

Alternative D

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. There would be no impact to two sage-grouse leks or nesting or brood rearing habitat along the east ridgeline of Cotterel mountain.

4.7 HISTORIC AND CULTURAL RESOURCES

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

- No Effect: If a site, which is eligible for or listed 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.

- No Adverse Effect: A site which is listed 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.

- Adverse Effect: A site which is listed on or eligible for the NRHP, that has unmitigatable effects taking place, requires that a "Section 106 Compliance Case Report" is 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.

An intact section of the Oregon Trail National Historic Trail (10CA862) at the north end of the Proposed Project area was previously identified within the Area of Potential Affect (APE). Another intact section of the trail, outside the Proposed Project area, is approximately four miles east of the previously documented Oregon Trail section. An intact section of the California Trail, east of the southern end of the Proposed Project area outside the APE, was previously identified and considered historic. The trail extends in a northerly direction and is approximately three miles from proposed turbines (Figure 3.3-1). Although no direct adverse impacts on these intact sections of the trail are expected as a result of the construction and operation of the Proposed Project, there are indirect visual effects on the experience of the users of these historic trails.

A 2004 aerial photograph indicating the potential locations of the wind turbines and a photographic simulation showing the wind turbines from a key viewing areas (Key Observation Points; see Section 4.13) were used to evaluate the visual impacts of the Proposed Project on the intact segments of the Oregon and California Trails.

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 resources that are currently evaluated or recommended as "Eligible" will have sufficient data collection so that a formal Eligibility Determination may be completed. Those deemed "Not Eligible" will have archival collection and documentation completed prior to disturbance or destruction.

Alternative B would result in the Proposed Project having a range of impacts on sites within the (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 from the Proposed Project.

Alternative B would have no impact to sites CM-S-5, CM-S-16, CM-S-20, or CM-S-22, since each of these is located outside of the APE and would be avoided. Impacts to the remaining 23 resources, and to any sites discovered during additional survey of the transmission interconnect lines and access roads, would range from no impact to adverse effect depending on if the site is eligible not.

At least three 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. In addition, remnants of the NRHP listed Oregon National Historic Trail (10CA862) are located in the Proposed Project area and may be subject to adverse effects if the Proposed Project is unable to avoid impacts to the trail. Indirect visual impacts to intact segments of this resource that are located outside of the APE are addressed in Section 4.13.

Though the Northside Alternate of the Oregon National Historic Trail (10MA273) is eligible for nomination to the NRHP, the Proposed Project would have no direct impact to this site because physical evidence of the linear trails is not present in the APE. The Northside Alternate of 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 would have no direct impact to the integrity of this resource.

Cultural resources located in the APE from previous inventories that are currently unevaluated, are considered potentially eligible for nomination to the NRHP pending further evaluation. These include lithic scatters at sites, 10MA3, and 10CA298 (not relocated during the most recent inventory), the historic railroad grade, 10CA864, and the Twin Falls Northside Canal, 000789. These resources 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 however, pursuant to FLPMA scientific values, such as mapping and final collection, will be completed.

Under Alternative B, the turbines would be visible from the intact section of the Oregon Trail located north of the Proposed Project area. Although the turbines would be visible from this section of the trail, other factors mitigate the potential negative visual effects including: intervening farm buildings and fencing; transmission lines; I-84 and I-86, SH-81 (adjacent to trail), and the distance from the turbines and other project features; and angle of view. Considering these factors, the Proposed Project would have a low to moderate visual impact on this segment of the trail.

The other intact segment of the Oregon Trial starts approximately four miles northeast of the northern most turbine under Alternative B. A photographic simulation (Appendix G) was used to illustrate the visibility of the turbines at a key viewing location approximately four miles from the north end of the

Proposed Project. The view of Cotterel Mountain is unobscured at this point on the trail and because of the topography, the intervening structures, utility lines and roads are not visually prominent. However, the four mile distance from the trail to the turbines diminishes the overall visual effects of the wind turbines on the landscape. Only approximately 30 degrees of the potential 360 degree views from the trail would be impacted by the wind turbines. Therefore, the accumulative negative visual effect of the Proposed Project under Alternative B, on this segment of the Oregon Trail would be low to moderate.

Turbines would also be visible from the intact section of the California Trail located east of the southern extent of the Proposed Project, along the east ridge of Cotterel Mountain. From this intact portion of the California Trail, the views of Cotterel Mountain are unobscured. However, the distance from the trail to the turbines would diminish the overall visual effects of the Proposed Project on the landscape. Approximately 40 degrees of the potential 360 degree views from the trail would be potentially affected. Although the turbines would be visible from this section of the trail, other factors were evaluated in considering the potential negative visual effects including farm buildings and fencing, transmission lines, SH-81, and the angle of view. Therefore, under Alternative B the potential negative visual effects on this intact segment of the California Trail would be moderate.

The transmission interconnect lines would add a visual feature to the landscape that is already a common sight from the intact sections of the Oregon and California Trails. While the transmission interconnect lines would be visible they would not be expected to detract from the overall character of the landscape.

4.7.3 Alternative C

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.

Impacts from Alternative C on historic trails would be similar to those described under Alternative B. Under Alternative C, the turbines would be spaced further apart resulting in a lower density of turbines along the ridgeline. However, the turbines under Alternative C would be taller and have larger blade diameters. This would result in the turbines being visible from a greater distance.

The transmission interconnect line under Alternative C would predominantly parallel an existing transmission line of similar size structure. From a distance it would not be highly visible and would not add a new feature to the landscape Therefore, it would not be expected that the transmission interconnect line under Alternative C would affect the view from the intact sections of the historic trail.

4.7.4 Alternative D

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.

Visual impacts to the historic California Trail would be eliminated under Alternative D. No turbines would be sited along the east ridge of Cotterel Mountain and therefore would not be visible from the intact sections of the California Trail located east of the Proposed Project area.

Potential impacts to the Oregon Trail would be the same as those described under Alternative C.

Potential impacts from the transmission interconnect line would be the same as those described under Alternative C.

4.8 AMERICAN INDIAN CONCERNS

Impacts to American Indian concerns are being identified during government-to-government consultation. These consultations are important to both the Tribes and the BLM.

4.8.1 Alternative A (No Action)

Implementation of the No Action Alternative would maintain the current level of impacts.

4.8.2 Alternative B

As of the publication of the Final EIS, ridges and mountaintops have been identified by the Tribes to be of special interest. In addition, sage-grouse, a spiritually significant species to the Tribes, could be displaced from Cotterel Mountain. Impacts including displacement or decline of sage-grouse, could affect the ability of the Tribes to exercise traditional use rights as well as the passing along of Tribal traditions and practices directly associated with the species.

4.8.3 Alternative C

Impacts under Alternative C would be the same as those described under Alternative B.

4.8.4 Alternative D

Under Alternative D there would less direct affects to species, habitat, aesthetics, and cultural resources.

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

Construction

Construction of the Proposed Project would last approximately eight months. 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 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.

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.

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

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**

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 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 construction would be expected to begin within one year of the issuance of the Record of Decision, 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 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.

[3] The IMPLAN model assumes that 25 percent of non-labor operation and maintenance costs would be spent within Cassia County or Minidoka County.
[4] The IMPLAN model assumes that seven of the 12 operation employees would originate from the Mini-Cassia area.

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 (supplies purchased) attributable to Proposed Project construction. Assuming approximately $7.5 million (20% 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 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.

Property Values

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 of the construction) attributable to Proposed Project construction are not expected to occur.

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.

[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).

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.

There are those, particularly in and surrounding the communities of Albion and Malta, who are strongly opposed to the Proposed Project. This opinion was reflected in a number of the comments received during the 90 day public comment period on the DEIS and in a petition that was delivered to the Burley Field Office Manager which indicated a high percentage of Albion residents in opposition to the Proposed Project. Conversely, a professionally conducted opinion poll of registered voters in Cassia County was commissioned by the Applicant in September of 2004 which showed that a high percentage of respondents were in favor of the Proposed Project. In addition, many people who submitted comments during both the public scoping period and 90 day comment period on the DEIS wrote in support of the Proposed Project. There are also those, including some living near the Proposed Project area, who voiced 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). These diverging points of view, at both the community and county levels have contributed to a minor negative change in community cohesiveness and may continue to do so if the Proposed Project is approved.

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, are not classified 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 nearly identical to Alternative B; therefore, the impacts would be similar. Under Alternative C, slightly fewer truck trips would be required than under Alternative B, however, potential impacts due to truck trips would likely be the same.

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.

Construction

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.

Operation

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, relatively 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. As a result, it may be prudent to install interpretive kiosks at the rest area along I-84 east of the Proposed Project area or along the back-county byway (SH-77) south of the Town of Albion or at other appropriate locations 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.

Alternative B with its associated road improvements and infrastructure (turbines, substations, transmission lines, and O&M building) would alter the current ROS category for Cotterel Mountain. The wind turbines would affect the naturalness of the area. The improved all weather gravel roads would be inconsistent with a semi-primitive motorized ROS designation. Areas designated as semi-primitive motorized have no or few roads (two-track jeep trails are okay), receive light motorized use, and maintain a predominantly unaltered landscape. Therefore, construction and operation of the Proposed Project under Alternative B would change the ROS of Cotterel Mountain within the Proposed Project area, from semi-primitive motorized to roaded natural.

Under Alternative B, two new transmission interconnect lines would be constructed. These transmission lines would be located in areas where there currently are no existing transmission lines. The siting of these transmission lines could alter recreation user views within these areas. However, the modification to the landscape would not be expected to occur to such a level as to result in a change to the ROS for these areas.

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. Under Alternative C, a portion of the existing primitive road would be maintained allowing for a continued semi-primitive motorized user experience. However, the wind turbines and improved all season project roads would be visible from the maintained portion of the primitive road resulting in a change to the viewers landscape. Therefore, construction and operation of the Proposed Project under Alternative C would also change the ROS of Cotterel Mountain within the Proposed Project area, from semi-primitive motorized to roaded natural.

Under Alternative C, the proposed transmission interconnect lines, although longer in length, would parallel existing transmission lines. The addition of a new transmission line next to the existing transmission would not result in a significant modification to the users view of the landscape. As a result no impacts to recreation would be expected to occur from either construction or operation of the proposed transmission interconnect lines under Alternative C.

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. Under Alternative D, a portion of the existing primitive road would be maintained allowing for a continued semi-primitive motorized user experience. However, as described under Alternative C, the wind turbines and improved all season project roads would be visible from the

maintained portion of the primitive road resulting in a change to the viewers landscape. However, Under Alternative D, no project features would be located along the east ridge of Cotterel Mountain. The majority of the views to recreation users along the east Cotterel Mountain ridgeline would be unaltered and the ROS for this area would be unchanged.

Under Alternative D, no impacts to recreation would be expected to occur from either construction or operation of the proposed transmission interconnect lines.

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 365 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 162 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.

Post construction monitoring at existing operational wind power projects has shown that livestock habituate to the operational wind turbines and continue to forage within the project areas.

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.

During construction of the Proposed Project under Alternative B, it could be necessary to close specific portions of Cotterel Mountain to livestock grazing. If these closures would be necessary, the permittees would be compensated by the Applicant for any costs associated with moving, feeding, or caring for displaced livestock during the construction period for the Proposed Project. Therefore, there would not be any impacts to livestock during construction of the Proposed Project under Alternative B, however, inconveniences to operators may be unavoidable.

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 147 acres (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 280 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 122 acres (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 158 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 five 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. Appendix G includes the visual simulations used for the visual contrast rating

The team assessed the visual contrasts between the viewshed of the Proposed Project area under all proposed alternatives 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 Project 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).

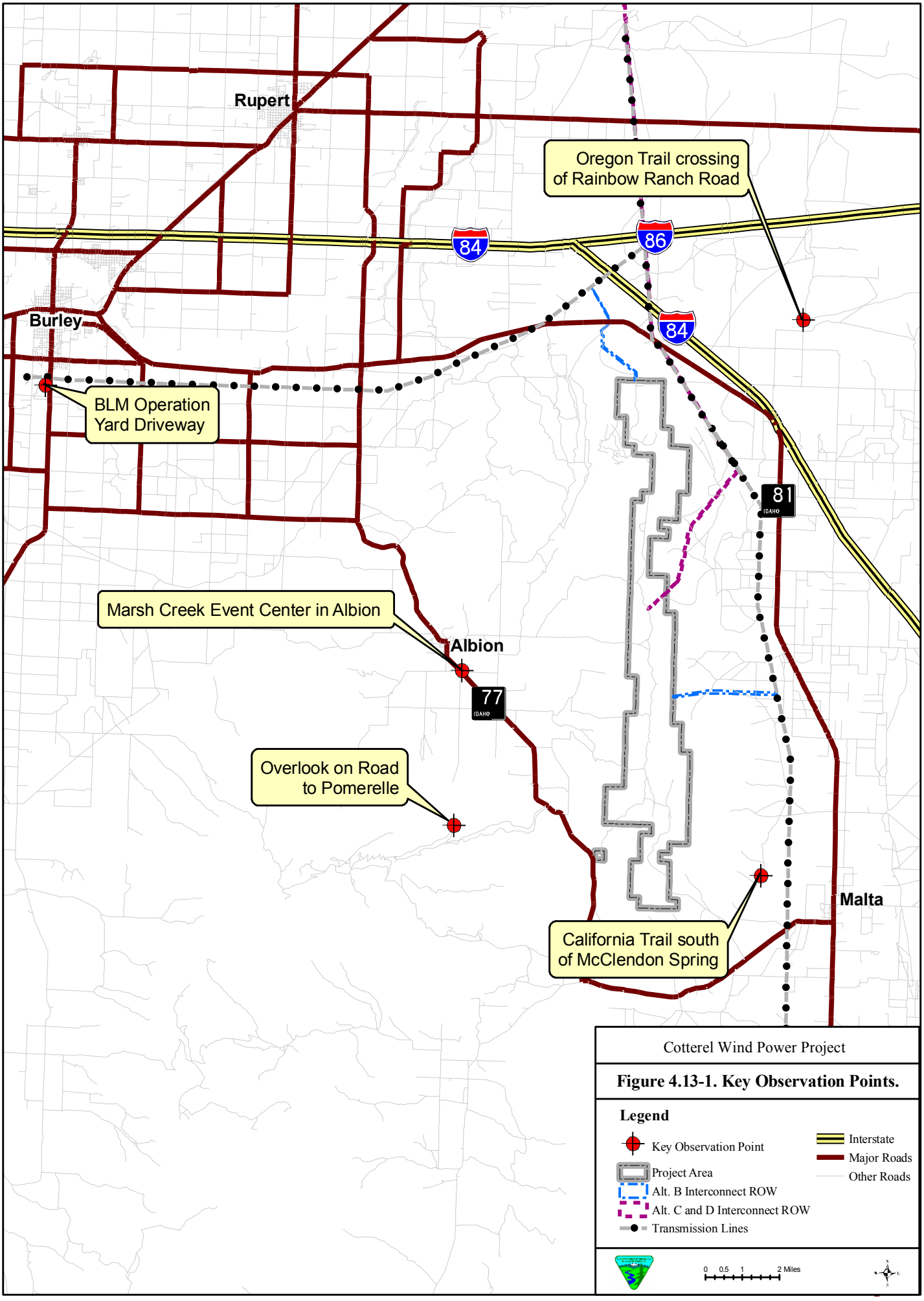
Rupert
Burley
Albion
Malta
Oregon Trail crossing of Rainbow Ranch Road
BLM Operation Yard Driveway
Marsh Creek Event Center in Albion
Overlook on Road to Pomerelle
California Trail south of McClendon Spring
84
86
84
81
IDAHO
77
IDAHO
Cotterel Wind Power Project
Figure 4.13-1. Key Observation Points.
Legend
Key Observation Point
Project Area
Alt. B Interconnect ROW
Alt. C and D Interconnect ROW
Transmission Lines
Interstate
Major Roads
Other Roads
0 0.5 1 2 Miles

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.

Visual Resource Contrast Rating Results

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 five KOP (Figure 4.13-1).

Table 4.13-2.Visual Contrast Rating for the Proposed Project Features Under All Alternatives .

		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
KOP 5: Marsh Creek Event Center				
ELEMENTS	FORM	None	None	Strong
	LINE	None	None	Strong
	COLOR	None	None	Weak
	TEXTURE	None	None	Strong

The contrast ratings were then compared to the approved Visual Resource Management (VRM) 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, and a “weak” contrast rating may be acceptable in a VRM Inventory Class II area. All of the proposed turbine strings fall within VRM Inventory Class IV. The project would be visible from Scenic Quality Rating Units (SQRU) 220, which is a VRM Inventory Class II area. Visual sensitivities for the SQRU that would be impacted range from Low to High (Table 3.9.1)

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; overall “strong” visual contrasts when viewed from the Marsh Creek Events Center; and an overall “weak” visual contrast when viewed from the BLM Office KOP.

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

Construction Phase

Visual resources would be impacted over the short-term during the construction phase due to the amount of vehicle and heavy equipment traffic that would be visible to the casual observer. The total number of truck trips necessary to complete construction of the project under this alternative is 14,675. The number of truck trips necessary to complete the Proposed Project would be greatest under this alternative.

Construction of the proposed North and South Access Roads would result in impacts to visual resources. Construction of these roads would involve a cut-and-fill process, using earth-moving equipment that would attract the attention of the casual observer in various locations. Topsoil stockpiled at staging areas during road construction would contrast with the surrounding landscape form, color, line and vegetation in site-specific areas. 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, I-84, and the community of Albion, ID. Visibility may be reduced over in site-specific areas from dust plumes associated with road construction. Impacts from traffic and dust created by constructing both the access roads would be short-term. The construction of new roads and reconstruction of existing roads would be greatest under this alternative. This alternative

would require the reconstruction of about 4.5 miles of existing road and the construction of about 22 miles of new road.

Up to five equipment laydown areas would be dispersed throughout the Proposed Project area. These areas would impact visual resources to different degrees depending on their specific locations. The equipment laydown areas would be used to store equipment and facility construction materials, provide equipment parking and refueling sites, crane assembly and disassembly areas, a cement batch plant, waste disposal and collection receptacles, sanitary facilities, and temporary modular office space. The total area impacted would be approximately 15 acres. The direct impacts associated with the presence of equipment and facilities in these areas would be short-term because they would only operate for the construction phase of the project. The footprint left by equipment laydown areas would create a contrast in the surrounding vegetation after the construction phase due to the operation of the laydown areas. Vegetation would be cleared at ground level where the batch plant operates leaving a noticeable contrast after its removal. Grading and revegetation of the laydown areas after the construction phase would reduce visual impacts from laydown area footprints over the long-term.

Cranes used to raise the towers would be visible from inside and outside of the Proposed Project area. The greatest visual impacts would result when a crane is observed from sensitive areas such as the community of Albion, ID and SH-77. Although the cranes would be operating within a Class IV area, they could be visible from the Class II designated area to the southwest. Crane activity would be the greatest under this alternative because the number of towers erected would be greatest.

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. There would be 9 miles of transmission interconnect lines constructed. Visual impacts associated with the construction of transmission interconnect lines would be lowest under this Alternative.

The construction of the operations and maintenance building would result in impacts to visual resources when observed by travelers from SH-77. Heavy equipment and materials used to construct this facility would be noticeable to the casual observer in a site-specific area. The impacts associated with construction are projected to occur over an eight-month period. The facility would also be constructed under Alternatives C and D.

Impacts to vegetation, landform, color, and texture would occur within each turbine pad laydown area during and after the construction phase. Each turbine erected would require a laydown area of 185-feet x 180-feet (33,300 square feet). Vegetation in this area would likely be crushed resulting in short-term alterations in vegetation, and texture to observers on the ridgeline. Impacts associated with turbine pad laydown areas would occur on 84 acres under this alternative. This impact would not be visible below the ridgeline.

Within each turbine pad laydown area, a 90-foot diameter area would be cleared of vegetation and graded to facilitate construction of the turbine foundation (Figure 2.3-6). A crane pad area 40-feet x 120-feet within each turbine pad laydown area would be cleared of vegetation and graded flat during construction resulting in visual impacts to vegetation, color, form, and texture. Impacts associated with the crane pad preparation under this alternative would total 14 acres under this alternative. Portions of the crane pad area would be re-graded and reseeded after the construction phase. Impacts associated with each crane pad would be reduced once seeded vegetation was established. The disturbance and alterations would not be visible from below the ridgeline.

Operational Phase

The greatest number of turbines (130) would be operated under this alternative. The turbines would be placed in strings along three separate ridgelines (Figure 2.4.1). Each turbine would be 210 feet in height to the center of the hub. Each of the three blades would be 115 feet in length, with an over-all diameter of 230 feet. Maximum blade height would be 325 feet above the surrounding landscape.

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 visual impacts associated with this string would be amplified due to its proximity to the backcountry by-way (SH-77) and the residents of Albion. The string would be less than two miles away from SH-77 and approximately six miles away from Albion. There would be up to seven turbines in the west string. The west string would not be visible from I-84 or SH-81 east of the main ridgeline. When viewing the west string from KOP 3 and KOP 5, contrast would be greatest during the afternoon hours when the sun is in the west. The west string would be eliminated under Alternatives C and D.

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. Unlike the west string, the center string would be visible from the east side of the main ridgeline. The center 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 the Albion Valley and the scenic corridor associated with SH-77. The center string would be 6 miles away from Albion and SH-77. It would be visible 4 miles away from SH-81 and 3 miles away from I-84 at its closest point. The center string would be visible from these aspects resulting in change the character of the ridgeline landscape. Contrast would result when viewing the center string from the Albion and Raft River Valleys. Currently the ridgeline texture appears smooth and undulating. Operation of the center string would alter texture of the ridgeline. This alteration would reduce the boldness contrast between the ridgeline and the sky. Rotation of the turbine blades would draw the attention of the casual observer from the rural valley foreground to the ridgeline, which would appear more industrial.

The center string structures would contrast in scale with the surrounding landscape. Currently, there are no tall trees visible on the ridgeline. Vegetation on the ridge is more or less prostrate when viewed from the KOP. A small cluster of radio communication towers exists on the ridgeline in the southern

portion of the Proposed Project area. Although the radio towers are visible from Albion Valley, they are isolated to an area of approximately one acre. Operation of the center string would create a noticeable contrast in scale to the casual observer along the ridgeline. When viewed from the east (KOP 1 and KOP 2), the visual contrast of the center string would be greatest during the morning hours when the sun is in the east. When viewed from the west (KOP 3, 4, and 5) the visual contrast of the center string would be greatest during the afternoon hours when the sun is in the west. Compounding this 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, SH-81 and I-84.

The east string would be visible from the east along SH-81 and the community of Malta. 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 impacts would be similar to those described above for the center and west strings. There would be more turbines on the east string than on the west string but fewer than the center string. The east string would not be visible from Albion Valley (KOP 4 and 5) but would be visible from Howell Canyon Road (KOP 3). Visual contrast would be greatest during the afternoon when the sun is in the west. When viewed from the east (KOP 1), the visual contrast of the center string would be greatest during the morning hours when the sun is in the east. When viewed from the west (KOP 3), the visual contrast of the east string would be greatest during the afternoon hours when the sun is in the west.

Under Alternative B, the proposed South Access Road would be visible from both the Howell Canyon road (KOP 3), Marsh Creek Events Center (KOP 5), and SH-77 City of Rocks Backcountry Byway. The visibility of the road cut in the side of the hill would contrast with the surrounding color, form, and texture of the hillside landscape. Impacts due to color contrast would result because the cut and fill process used to construct the road would result in lighter colored materiel on the hillside than the surrounding vegetation and rock outcrops. The dark greens and browns that give the hillside its existing color result from a combination of vegetation and rock outcrops. The roadcut would contrast with the current mix of color by presenting a thin swath of light brown substrate across the hillside. This color contrast would be more apparent in the spring and early summer when vegetation is more green than brown. The line of this road would generally follow the horizontal character of the landscape. The form of the hillside would be visibly altered as a result of the roadcut. The cutbank of the road would alter the shape if the hillside impact the background view from these areas, resulting in a visual impact over the long-term.

The structure at the junction of SH-77 and the proposed South Access Road would be expanded and operated as an O&M building to accommodate the project under this alternative. 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. The expanded structure would not be visible from KOP 1, 2, or 4. Portions of the structure (communication towers, lights) may be visible from KOP 3 and 5.

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. These impacts would not result in stark contrasts to the existing landscape since roads already exist there. The proposed roads would be wider than the existing ones.

Transmission interconnect lines would be visible from the north and east side of the Proposed Project area (KOP 1 and 2). 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.

Seasonal variations in visual impacts from all turbine strings, roads, substations and other infrastructure would result from weather patterns in the area. Spring and summer generally bring blueish skies and high clouds that would not obscure the view of the center string. Visual contrasts during this period would be greater than in the late autumn and winter months. Late autumn and winter often bring grayish skies and low clouds that would reduce contrasts. Fog may completely obscure the structures in the fall and winter.

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 that would be visible to the casual observer. The estimated number of truck trips necessary to complete the project under this alternative would be 12,735. These impacts would be reduced from Alternative B but greater than Alternative D due to differences in the number of turbines and roads constructed. 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 surface disturbance, traffic, and dust created by constructing the access road would be short-term. Impacts associated with the south access road would be less than those described under Alternative B because the existing road would not be relocated under this alternative. Construction of roads on the ridgeline would be less than Alternative B but greater than D. This alternative would require the reconstruction of about 3.2 miles of existing road and the construction of about 19.5 miles of new road.

Impacts associated with the visibility of cranes during construction would be similar but less widespread than those described under Alternative B because there would be fewer turbines constructed under this alternative.

Impacts from the construction of a transmission interconnect line would be similar to those described under Alternative B. The location of the impacts under this alternative would be different than Alternative B because there would only be one interconnect line under this alternative. The transmission interconnect line would be 19.7 miles in length under this alternative. There is over twice as many miles of new transmission interconnect line 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. Impacts would be less than slight where the proposed transmission line parallels the existing one.

Impacts associated with the construction of the O&M building would be the same as those described under Alternative B.

Impacts associated with turbine pad laydown areas would be similar but less widespread than those described for Alternative B. The turbine pads under this alternative would be the same size as those described under Alternative B, but there would be fewer constructed. Impacts from turbine pad laydown areas would range from 62 to 75 acres.

Impacts associated with the surface disturbance from crane pad areas would be similar but less widespread than those described for Alternative B. The crane pads under this alternative would be the same size as those described under Alternative B, but there would be fewer constructed. Impacts from crane pad areas would range from 9 to 11 acres under this alternative.

Operational Phase

There would be fewer turbines operated under this alternative than under Alternative B. The number of turbines operated under this alternative would range from 81 to 98. A range of wind turbine sized would be considered. The smaller end of the range would be identical to the turbines described for Alternative B. The larger versions would be 262 feet in height to the center of the hub. Each of the three blades would be 164 feet in length, with an overall diameter of 328 feet. Maximum blade height would be 426 feet above the ground. Compared to Alternative B the center string would be about 1.5 miles longer towards the north and 1.5 miles shorter from the south.

Under this alternative, facilities would be similar to those described under Alternative B. In comparison, there would be: 25 percent to 38 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. The combined length of both turbine strings would be 14.5 miles with more space between each tower than Alternative B.

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 the east, west and north if the taller versions of tower were constructed. Visual impacts when viewing the center string from the south would be similar but less widespread than those described under Alternative B because the string would be trimmed by 1.5 miles on the southern end. 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 could be taller and the turbines could 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.

Impacts associated with the southern access road would be less than those described under Alternative B due to the elimination of the hill cut below the telecommunication towers on the summit of Cotterel Mountain. Visual impacts associated with the improvement of the existing road under this alternative would result in a slightly more visible gravel surface in that site-specific area.

Expansion of the O&M building and improvements to the North Access Road would have the same impacts as described under Alternative B.

Impacts associated with transmission interconnect lines would be similar to those described under Alternative B, although the location of the impacts would be different under this alternative. There is over twice as many miles of new transmission interconnect line proposed under this alternative compared with Alternative B. The majority (approximately 15 miles) of the interconnect line would parallel the existing Raft River Transmission line. Impacts from the remaining portion of the interconnect line would be similar to those described for the eastern transmission interconnect line under Alternative B. Impacts would be slight where the proposed transmission line parallels the existing one.

Seasonal changes in visibility of the project would be the same as those described under Alternative B.

4.13.5 Alternative D

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 that would be visible to the casual observer. The estimated number of truck trips necessary to complete the project under this alternative would be 9,750. These impacts would be reduced from Alternative B and C due to reductions in the number of turbines and roads constructed under this alternative. 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. As with Alternative C, there would be modification of the existing south access road but no new road would be constructed there. Impacts from the construction of new roads on the ridgeline would be similar but less widespread than those described under either Alternative B or C because there would be fewer miles of road necessary to access the turbines under this alternative. Impacts from traffic, dust, and stockpiled materials created by constructing both the access roads and the main ridgeline road would be short-term. New road construction would total approximately 14.5 miles under this alternative. Reconstruction of about 2.9 miles of existing road would also be necessary under this alternative.

Impacts associated with the visibility of cranes during construction would be similar but reduced when compared to either Alternative B or C. The cranes would be less visible during construction because there would be fewer towers to be constructed, and both the east and west strings of towers would be eliminated under this alternative.

Impacts associated with equipment laydown areas would be the same as those described under Alternative B.

Impacts to visual resources associated with turbine pad laydown areas would be similar but less widespread than those described under either Alternative B or C because there would be fewer turbine pad laydown areas under this alternative. Turbine pad laydown areas would range between 66 to 82. Short-term impacts to vegetation on the ridgeline would occur on 50 to 63 acres under this alternative.

Impacts associated with crane pad areas would be similar but less widespread than those described for either Alternative B or C because fewer towers would be raised under this alternative. Impacts from crane pad areas would range from seven to nine acres under this alternative. Impacts from the construction of a transmission interconnect line would be the same as those described under Alternative C.

Impacts from construction of the operations and maintenance building would be the same as those described under Alternative B.

Operational Phase

The number of turbines operated under this alternative would range from 66 to 82. The turbines would be placed in a string along a single ridgeline (Figure 2.6.1 and Figure 2.6.2). This alternative would use the same size range and types of wind turbines as those proposed under Alternative C. Visual impacts associated with the operation of turbines would be similar but less widespread than either Alternative B or C because there would only be one string of turbines under this alternative.

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.

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.

The South Access Road would result in the same impacts to visual resources as those described under Alternative C. The North Access Road would result in the same impacts to visual resources as those described under Alternative B.

Seasonal changes in visibility of the project would be the same as those described under Alternative B.

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 turbines of the Proposed Project would be operated during nighttime hours

and would introduce a new element into the nighttime environment of the Cotterel Mountain 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 currently used, stored or disposed of 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.

4.14.4 Alternative D

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

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

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, fuels management, and fire rehabilitation (ESR) projects. The analysis takes into account guidance provided in the Cassia RMP and the South Central Idaho Fire Management Plan (USDI 2004).

4.15.1 Alternative A (No Action)

Alternative A, would have no impact on the ability suppress wildfire and manage surface fuels within the Proposed Project area.

4.15.2 Alternative B

Construction Impacts

The risk of human caused ignitions in the Proposed Project area could increase slightly over the short-term during construction activities. Operation of heavy machinery and work crews near flammable vegetation during periods of high fire danger (e.g., hot and windy summer days) would increase the potential for ignition. Welding, or other fabrication activities that produce sparks would pose the highest risks. 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 within 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 (towers, transmission interconnect lines, substations, etc.), and hazardous materials (e.g. fuel storage tanks).

Operational Impacts

Operation of constructed and improved roads could have long-term impacts to fire management. New and improved roads would provide better access to the Proposed Project area for both the public and firefighters alike. In the event of an ignition, fire suppression crew response time would decrease, resulting in the potential for earlier containment of wildfire and a reduction in acres burned. New roads would benefit fire managers indirectly by acting as fuel breaks in the event of fire suppression operations. Fuel breaks generally reduce the rate of spread of fire. Additional fuel breaks in the Proposed Project area would increase the ability of firefighters to suppress wildfire safely. The risk of human caused ignitions would increase if improved access roads resulted increased public visitation. The combination of improved access and lack of fuel associated with new roads could reduce average fire size in the Proposed Project area.

The Proposed Project would increase the number of safety hazards that firefighters may have to negotiate in the event of wildfire suppression within the Proposed Project area. Fire crews operating

from both the ground and the air would encounter increased safety hazards from towers, turbines, substations, and transmission interconnect lines. The presence of these structures may limit fire suppression strategies in the event of a wildfire in the Proposed Project area. For example, the use of aerial retardant may be reduced due to the presence of the windtowers. Safety hazards associated with the Proposed Project could force fire management to use indirect suppression tactics when responding to fires in the Proposed Project area if the safety risk is to great for direct suppression. A greater number of acres could burn within the Proposed Project area where indirect suppression tactics replace direct suppression tactics.

Electrical trenching could limit fuel break construction in site specific areas. While the majority of electrical trenching would follow a fuel break associated with new roads constructed under this alternative, the ability to widen the fuel break could be limited due to the electric trenches. Fuel breaks created by earth moving equipment such as bulldozers may not be appropriate where electrical trenching would exist. Electrical trenches could also limit post fire emergency stabilization and rehabilitation efforts. Emergency stabilization and rehabilitation practices often utilize rangeland drills, disks, or other heavy equipment that may not be appropriate near an electrical trench. This alternative proposes the most miles of electrical trenching.

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.

The presence of towers, wind turbines, and substations along the ridgeline could have an adverse 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

The potential for ignition within the Proposed Project area during construction activities would increase under this alternative for the same reasons discussed under Alternative B. The actual ignition potential under this alternative would be slightly less than Alternative B because there would be fewer truck trips necessary to complete the project. The presence of construction crews, equipment, and hazardous materials in the event of a wildfire would have the same impacts to mobilization and operation of fire suppression crews as described under Alternative B.

Operational Impacts

New and improved roads would increase vehicle access to the Proposed Project area. Better access to the Proposed Project area could shorten firefighter response times in the event of wildfire. These impacts would be the same as Alternative B. The risk of human caused ignitions from increased vehicle access to the public would be the same as Alternative B.

New roads in the Proposed Project area that act as fuel breaks during fire suppression activities would have similar but less widespread impacts than those described under Alternative B. There would be fewer miles of roads operated under this alternative than under Alternative B.

The impacts to fire management associated with safety hazards from turbines, substations and transmission interconnect lines would be similar to Alternative B, but less widespread under this alternative. Under this alternative, there would be fewer towers, turbines, and substations constructed. Although there would be more transmission interconnect line constructed under this alternative compared to Alternative B, the majority of proposed transmission lines under this alternative would follow existing lines. Therefore, the overall safety landscape in terms of fire and fuels management would be less adversely impacted under this alternative, than under Alternative B.

The potential for lightning strikes would be similar to Alternative B, but less widespread under this alternative because there would be fewer turbines constructed. Impacts to fireline construction and emergency stabilization and rehabilitation activities would be similar to Alternative B, but less widespread under this alternative because fewer miles of electrical trenching are proposed.

Impacts to radio communications from proposed structures would be similar to Alternative B, but less widespread under this alternative because fewer towers are proposed.

4.15.4 Alternative D

Construction Impacts

The potential for human caused ignition of flammable vegetation during construction activities would exist for the same reasons described under Alternative B. Actual ignition potential under this alternative would be less than either Alternative B or C because fewer truck trips would be necessary to complete construction. The presence of construction crews, equipment, and hazardous materials in the event of a wildfire in the proposed project area would have the same impacts to mobilization and operation of fire suppression crews as described under Alternative B.

Operational Impacts

Impacts to incident response times and human ignition potential within the Proposed Project area would be similar to those described under Alternative B, but less widespread under this alternative because fewer roads would be constructed. This alternative proposes fewer new roads than either Alternative B or C.

New roads in the Proposed Project area that act as fuel breaks during fire suppression activities would have similar impacts to fire suppression as those described under Alternative B, but would be less wide spread under this alternative because there would be fewer new roads constructed.

The impacts to fire management activities associated with additional safety hazards from turbines, substations, and transmission interconnect lines would be similar to Alternative B, but less widespread under this alternative because there would be fewer structures. The safety hazard created

by proposed transmission lines and substations would be the same as Alternative C. However, there would be fewer turbine towers under this alternative than under either Alternative B or C.

The potential for lightning strikes would increase for the same reasons discussed under Alternative B. The potential for lightning strikes would be slightly less under this alternative than either Alternative B or C because there would be fewer turbine towers constructed.

Impacts to radio communications from proposed structures would be similar to Alternative B and C, but less widespread under this alternative because fewer towers are proposed.

4.16 EFFECTS OF ADAPTIVE MANAGEMENT

Adaptive Management is a core set of principles and values, and a formal process that would guide the planning, design, construction, operation, monitoring and management of the Cotterel Wind Energy Project (See Section 2.5.4). The overall goal of the adaptive management process is to identify and minimize adverse environmental, health, safety, social and economic affects through regular formal collaborative and iterative information sharing, feedback, response and actions between BLM, the Applicant and the Technical Steering Committee.

During project design and construction project facilities would be micro-sited, to minimize impacts to resources through application of the adaptive management process. During operation of the Proposed Project data collected through monitoring would provide information on the effects to wildlife, particularly avian species and bats. These effects can occur in a variety of ways but based on data collected at other wind farms, are chiefly associated with bird collisions with the large blades that drive each of the wind turbines (referred to as the rotor swept area of each turbine). 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.

4.17 CUMULATIVE EFFECTS (IMPACTS)

Cumulative impacts result when the effects of an action are added to or interact with the combined effects of all other ongoing actions in a particular place and within a particular time. While impacts can be differentiated as direct and indirect, and short-term and long-term, cumulative impacts consider the compounding effects of all actions over time and space. Thus, the cumulative impacts of an action can be viewed as the total combined effects of all activities on a particular resource, ecosystem, or human community, no matter what entity (federal, non-federal, or private) is taking the actions (EPA 1999)

This cumulative impacts section provides a general description of regional influences; and then discusses the cumulative impacts for each resource by alternative. The cumulative impact discussion combines the regional influences (influences outside the Proposed Project area) with the individual resource impacts (influences inside the Proposed Project area as a result of the proposed alternatives) as discussed in Section 4.0 Environmental Consequences.

Regional influences discussed include: changes in land use; recreation; invasive species and noxious weeds; Special Status Plants; livestock grazing; and lands and realty actions (projects).

Each discussion of cumulative impacts begins with a description of the region of influence for that resource followed by a discussion of past and current trends, as well as future anticipated trends:

- Past and current trends describe the current regional status of the resource being discussed, as well as noteworthy events from the past that contributed to the current situation.

- Future anticipated trends discuss the potential outcomes of current trends in the foreseeable future.

- Following the past, current and future trends section is a description of cumulative impacts for each of the alternatives. This part of the analysis addresses the region wide affect that management proposed could have on the resource being discussed.

The time of influence for which cumulative impacts are analyzed is from the operation of the Proposed Project to the year 2036. The year 2036 was selected because in that year, the operators of the Proposed Project would need to either apply for a new operational permit, or remove the project and reclaim the project area.

4.17.1 Regional Influences

Wind Energy Development

Wind power grew rapidly in 2005 both nationally and worldwide, becoming more and more competitive as natural gas prices jumped and crude oil prices reached record highs. Improved technology, a significant federal production tax credit and pressure on utilities to use clean energy sources has helped fuel the growth across the nation. Idaho ranks 13th in the nation in wind power potential according to the Idaho Department of Water Resources Energy Division. Commercial wind farms in Idaho include the 10.5 MW Fossil Gulch near Hagerman; 324-kilowatt Lewandowski wind farm near Mountain Home and, the 64.5 MW Wolverine Creek wind farm near Idaho Falls.

Currently, there are other proposed wind power projects on private land that have received county approval for construction: a trio of 200 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.

Currently there are three other wind energy ROW applications on BLM managed lands in Idaho. These sites are located at Danskin Mountain, north of Mountain Home, at the King Hill area 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.

There are currently over 30 anemometers scattered across eastern, southcentral, southern and western Idaho, collecting data on wind speed. These anemometers 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 (Figure 4.16-1).

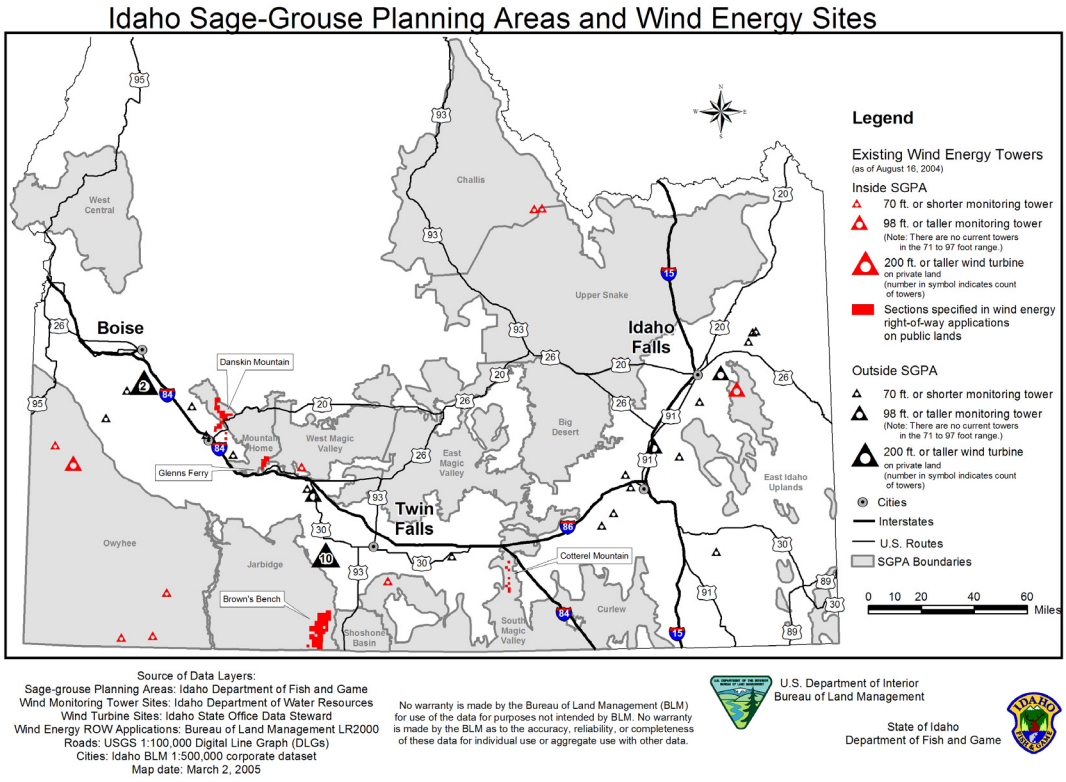

Figure 4.17-1. Idaho Sage-grouse Planning Areas and Wind Energy Sites.

Recreation

The natural beauty and outstanding recreation opportunities draw thousands of visitors to Idaho annually. As the U.S. and Idaho populations grow, so too does demand for outdoor recreation opportunities. In addition, changing industries and life-styles in Idaho and the surrounding region are contributing to a shift in natural resource use and management away from traditional product-oriented industries to more amenity-based industries. Tourism is the fastest growing economic activity in Idaho, and will likely intensify over the next five to 10 years based on current population estimates (ISPR 2002). While outdoor recreational activities and tourism can help many rural communities diversify or supplement a reduction in historic consumptive, industrial-based activities, proactive management will be needed to minimize the social and environmental costs associated with increased non-consumptive uses. Maximizing benefits while minimizing or mitigating the costs to natural resources is vital to the sustainability and health of these communities.

The 2003-2007 Idaho Statewide Comprehensive Outdoor Recreation and Tourism Plan (SCORTP), developed under the direction of the Idaho SCORTP Task Force (ISPR 2002), ranked the relative importance of 19 issues associated with outdoor recreation. Idahoans ranked the following as their top 10 issues:

1. Protecting water quality
2. Protecting existing access to public lands
3. Protecting natural resources on public lands
4. Educating youth about natural resources and the environment
5. Controlling invasive species
6. Educating adults about natural resources and the environment
7. Providing recreation safety instruction to youth
8. Providing outdoor recreation education for youth
9. Providing access for the disabled
10. Rehabilitating outdoor recreation facilities

In addition to these issues, several key outdoor activities have increased appreciably in Idaho and are likely to continue to increase in the future (Cordell *et al.* 2004; ISPR 2002). These activities were also found to be more prevalent in Idaho and other rural states than the rest of the nation as a whole. They include, but are not limited to motorized vehicle use, hunting, and water-based recreation. A number of other activities, including non-pool swimming, canoeing, and visiting a beach or waterslide are generally associated with water-based activities and were therefore included (Cordell *et al.* 2004). According to a national study by Cordell *et al.* (2004), the Rocky Mountain Region will see a significant demand increase for water-based activities over the next several years.

The demand for OHV use has grown significantly. In 1960, when the first of the U.S. national survey was done for the Outdoor Recreation Resources Review Commission, off-road motorized recreation was not even on the "radar" as a recreational activity. However, from 1982 to 2001, OHV use became one of the fastest growing activities in the country, growing in number of participants greater than 12 years old by over 100 percent (Cordell *et al.* 2004). Based on their survey (from Fall 1999 to summer 2000), an estimated 37.6 million people 16 years of age or older (17.6% of the population) had ridden or driven motor vehicles off-road at least once in the past 12 months. That number increased to an estimated 49.6 million by fall 2003 to Spring 2004 (rising to 23.2% of the population).

Similarly, according to the 2002 SCORTP report, Idahoans participate in more wildlife-based activities than the rest of the nation, with hunting being the number one activity. Idahoans hunt big game four times as often as the national average, and hunt waterfowl nearly six times as often. Non-consumptive wildlife activities, such as viewing animals, were also higher than the national average (ISPR 2002).

Based on current population trends, the demand for these and other outdoor recreational activities in Idaho and the surrounding region is likely to increase in the future. As a result, the region will need resources for biking, picnicking, walking, camping and family gatherings in coming years to meet

population projections (ISPR 2002). Based on these estimates, a greater emphasis is likely to be placed on facilities development and management of recreational activities in order to reduce the overall potential impacts to natural resources and conflict between user groups.

Invasive Species and Noxious Weeds

Invasive species and noxious weeds are harmful, non-native plant species that damage our economy and environment by displacing ecologically or economically valuable native rangeland species or agricultural crops or threaten the integrity of streams and lakes. As international commerce and travel increases, so does the threat that unwanted species will arrive in Idaho or infest areas where they are not now established.

Over the years, Idaho, like all other states, has enacted statutes and created programs designed to prevent and manage a wide variety of invasive species. Often, these programs are administered in cooperation with various partners and range from monitoring site-specific populations to landscape-wide trends. The agencies involved in this important work include: Cassia and Minidoka County Weed Departments; Idaho Department of Lands; Idaho Department of Fish and Game; Idaho Transportation Department (ITD); Idaho Power Company; private landowners; and U.S. Department of Agriculture's Animal, Plant Health Inspection Service (APHIS).

In addition, the University of Idaho colleges of Agriculture and Natural Resources and the Cooperative Extension Service play important research and educational roles. Local governments, industries and their associations, various interest groups and individuals work cooperatively in control and educational efforts. These groups often come together to develop cooperative weed management areas and the Idaho Weed Awareness Campaign.

The Idaho Strategic Plan for Managing Noxious Weeds was released in February of 1999, which created Statewide Cooperative Weed Management Areas (CWMA) that develop and integrate weed management plans. These weed management programs are responsible for identifying local and regional invasive species and noxious weed concerns and educating local landowners on treatments and government aids. Currently there are 32 successfully functioning CWMA that cover approximately 82% of the state, including the area surrounding Cotterel Mountain. This cooperative process has since lead to the establishment of the Idaho Invasive Species Council (IISC), which was established by Governor Kempthorn's Executive Order No. 2001-11. The primary task of IISC is to "provide policy level direction and planning for combating harmful invasive species infestations throughout the state and for preventing the introduction of others that may be potentially harmful". In addition to these and other invasive species and noxious weed management programs implemented by the state, and on a county-by-county basis, various federal statutes have been put in place to combat invasive species and noxious weeds.

Noxious weed treatments in the Proposed Project area could result in cumulative benefits within the larger region of influence. Where new populations of noxious weeds were eradicated within the Proposed Project area, they would be eliminated as a possible seed source for other areas in the

region. This would reduce crop losses, decrease wildlife habitat degradation, and improve recreational site quality. Overall impacts would be less than slight.

Special Status Plants

In addition to regulatory and other protective measures associated with public and state lands, areas containing known special status plant populations generally have greater protection, which has beneficial long-term affects to those species. Private lands have no regulations to protect special status plants; therefore, impacts to individual populations from surface disturbing activities on private lands could reduce the overall connectivity of the regional population and lead to future extinction or genetic separation. However, state and federal agencies have been working with private individuals and corporations to reduce impacts through voluntary conservation measures. These agreements could increase protection of special status plants regardless of ownership, which would have beneficial regional effects.

Livestock Grazing

By 2009, public land grazing within and outside the Proposed Project area will be managed under Idaho Standards and Guides for Livestock Grazing Management to enhance healthy, functioning and productive rangelands.

Where livestock operators on private lands in the region continue not to implement BMP, riparian area vegetation and downstream water quality could continue to be adversely affected. For example, where livestock are allowed unrestricted access to stream banks, or where upland grazing increases off-site erosion and sedimentation, pollutants could be increased locally and travel downstream. Unmanaged grazing in riparian areas may also reduce stream bank stability, resulting in blowouts during high run-off events and increased sediment loads that reduce water quality further downstream. Infestations of invasive species on private lands, including noxious weeds, may become a seed source for lands elsewhere. Riparian vegetation would be adversely affected by invasion of noxious and other weed species. Riparian areas could improve where land managers install range improvements, such as fences, cattle guards, pipelines, and water developments to enable livestock use while protecting water quality and riparian vegetation.

Land and Realty Actions (Projects)

Cumulative impacts are an aggregate of many direct and indirect effects and include actions, which have occurred or can reasonably be expected to occur both within and outside of the Proposed Project area. The following are key cumulative actions within the vicinity of the Proposed Project assessed in the EIS (Table 4.16-1).

Table 4.17-1. Land and Realty Actions (Projects) Located in the Region of Cotterel Mountain.

Project	Status	Purpose	Expected Completion	Contact
Idaho State Highway 77	In Progress	Road Improvement	December 2005	ITD
	Description: A width restriction of 12 feet is in effect. Any over-width vehicles will be required to detour using SH-81 from Declo to Malta, and then SH-77 from Malta to Albion. Delays of up to 10 minutes are possible. The speed limit is 35 mph and traffic is reduced to one lane. The project will create a smoother road surface.			
	Location: Project begins five miles south of Declo and continues to Albion (mileposts 18-23).			
Idaho State Highway 81	In Progress	Bridge Reconstruction	May 2006.	ITD / Cannon Builders, Inc. of Blackfoot, Idaho
	Description: Crews are repairing the J&H Canal Bridge. Vehicles traveling through the work zone are limited to a maximum width of 12 feet and length of 45 feet. Vehicles exceeding those restrictions must detour using SH-77 from Declo to I-84 at exit 216, and I-84 to SH-81 at exit 228. Flaggers will be used periodically. Motorists should expect delays of up to 10 minutes.			
	Location: SH- 81 (milepost 23-25) one mile east of Declo.			
City of Rocks Back County Byway	Proposed	Road Improvement	Pending	ITD
	Description: Reconstruct and pave a portion of the City of Rocks Back County Byway.			
	Location: Between Elba and Almo.			
Gravel Pit (BLM Project # ID-220- 2005 - CE-531)	Proposed	Aggregate Source	Pending	BLM
	Description: A gravel pit may be reopened by the BLM. The pit would be reopened to replace the exhausted pit further to the south.			
	Location: Five miles south of Malta.			

Table 4.17-1. Land and Realty Actions (Projects) Located in the Region of Cotterel Mountain.

Project	Status	Purpose	Expected Completion	Contact
Feedlots (2)	Proposed	Commercial Livestock	Pending	Cassia County
	Description: Applications have been submitted by private developers to Cassia County Officials for the construction and operation of contained animal feeding operations. There would be two separate operations, pending approval.			
	Location: Raft River Valley and Cassia County.			
Geothermal Exploration	In Progress	Commercial Energy Development	Ongoing	U.S. Geothermal
	Description: U.S. Geothermal is conducting geophysical exploration. The goal of U.S. Geothermal is to develop a commercially viable geothermal electrical generation facility on private land.			
	Location: Private and BLM managed lands south of Jim Sage Mountain. Their proposed development would be approximately 25 miles south of the Proposed Project area.			
Rights-of-Way (3)	Pending	Potential Energy Development	Unknown	BLM
	Description: Applications for ROW have been submitted to the BLM. Various phases of windspeed monitoring are currently being conducted at three different sites.			
	Location: Danskin Mountain, north of Mountain Home, Idaho. King Hill area North of Glenns Ferry, Idaho. Brown's Bench, southwest of Twin Falls.			
Wind Power	Completed	Energy Generation	N/A	Private
	Description: Three operational wind turbines.			
	Location: South of Interstate 84, Between Boise and Mountain Home, Idaho.			

Table 4.17-1. Land and Realty Actions (Projects) Located in the Region of Cotterel Mountain.

Project	Status	Purpose	Expected Completion	Contact
Wind Power	Completed	Energy Generation	N/A	Exergy
	Description: Seven operational wind turbines.			
	Location: Near Hagerman, Idaho, south of the Snake River.			
Wind Power (3)	Approved by County	Commercial Energy Development	Unknown	Ridgeline / Airtricity
	Description: A trio of 200 MW projects has received county approval.			
	Location: Near Idaho Falls, Idaho.			
Wind Power (2)	Approved by County	Commercial Energy Development	Unknown	Ridgeline / Airtricity
	Description: A pair of 200 MW projects has received county approval.			
	Location: Near American Falls, Idaho.			
Wind Power	Approved by County	Commercial Energy Development	Unknown	Windland
	Description: A 200 MW project has received county approval.			
	Location: Near American Falls, Idaho.			
Wind Power (4)	Approved by County	Commercial Energy Development	Unknown	Exergy
	Description: Four 10 MW projects have received county approval.			
	Location: Near Hagerman, Idaho.			

Table 4.17-1. Land and Realty Actions (Projects) Located in the Region of Cotterel Mountain.

Project	Status	Purpose	Expected Completion	Contact
Wind Speed Monitoring	Ongoing	Energy Development	Unknown	N/A
	Description: Over 30 wind-monitoring towers collecting data on wind speed.			
	Location: Scattered across eastern, southcentral, southern, and western Idaho. These towers are located on private, state, Tribal, and federal lands.			
Oakley Reservoir	Completed	Irrigation / Recreation	N/A	U.S. Army Corps of Engineers
	Description: The reservoir was build as an earthen dam on Goose Creek. The reservoir was completed in 1911. It has a current usable capacity of 77,400 acre-feet. The reservoir does not have a channel to convey and release from the emergency spillway to the Snake River, causing a flooding hazard for the towns of Oakley and Burley.			
	Location: The reservoir is located in southern Cassia County, approximately five miles south of the town of Oakley, Idaho.			
Cow Gulch Exclosures (BLM # ID-220-2005-CE-973)	Proposed	Rangeland Improvement	Unknown	Nancy Ady, (208) 677-6685
	Description: Information at BLM Burley Field Office.			
	Location: South of Albion.			
Howell Creek Electric Fence (BLM # ID-220-2005-CE-972)	Proposed	Rangeland Improvement	Unknown	Nancy Ady, (208) 677-6685
	Description: A temporary electric fence will be constructed to create an exclosure. Further information at Burley Field Office, U.S. BLM.			
	Location: Howell Creek in Cassia County.			
Aggregate Quarry Expansion Permit (BLM # ID-220-2005-DNA-902)	Pending	Source of construction material	Unknown	Forrest Griggs, (208) 677-6667
	Description: Application has been made requesting additional 50,000 cubic yards of material to be mined at the quarry over ten years.			
	Location: Marion Pit, four miles north of Oakley, Idaho.			

Table 4.17-1. Land and Realty Actions (Projects) Located in the Region of Cotterel Mountain.

Project	Status	Purpose	Expected Completion	Contact
Rock Garden Quarry (BLM # ID-220-2005-EA-985)	Pending	Quarry Decorative Stone	N/A	Forrest Griggs, (208) 677-6667
	Description: Operator is transitioning from Notice of Intent to Plan of Operation.			
	Location: Middle Mountain, eight miles south of Oakley, Idaho.			
Fish Creek Quarry Expansion	In Progress	Quarry Stone	April 2006	Steven Flock (208) 678-0430 sflock@fs.fed.us
	Description: Expand stone quarry to 29 acres.			
	Location: Township 15 South, Range 23 East, Section 10, Boise Meridian, Albion Division of the Forest Service.			
Conner Creek Allotment Exclosure #2 (BLM # ID-220-2005-CE-984)	Proposed	Rangeland Improvement	Unknown	Nancy Ady (208) 677-6685
	Description: Build an exclosure around seep. Additional information available at the BLM Burley Field Office.			
	Location: West of Conner, Idaho.			
Conner Creek Fence Realignment (BLM # ID-220-2005-EA-843)	Proposed	Rangeland Improvement	Unknown	Nancy Ady (208) 677-6685
	Description: Realigning Fence. Additional information available at the BLM Burley Field Office.			
	Location: West of Connor, Idaho.			
Wickel Spring Development	Proposed	Rangeland Improvement	Unknown	Nancy Ady (208) 677-6685
	Description: Develop spring and install pipeline and two troughs.			
	Location: Northwest of Conner, Idaho.			

Table 4.17-1. Land and Realty Actions (Projects) Located in the Region of Cotterel Mountain.

Project	Status	Purpose	Expected Completion	Contact
Pomerelle Mountain Resort	Pending	Recreation	Unknown	Resort Office (208) 673-5599
	Description: The project would likely involve construction of additional ski runs, facilities, and lifts to accommodate additional users.			
	Location: Mount Harrison, Sawtooth National Forest, Idaho.			
Oakley Stone Quarry	In Progress	Mining	Ongoing	N/A
	Description: An open pit decorative stone quarry operation expansion.			
	Location: South of the town of Oakley, Cassia County.			
Vegetation Treatments	Various	Hazardous Fuels Reductions and Rangeland Seedings	Complete	Rance Marquez (208) 677-6697
	Description: These are various vegetation manipulations on BLM lands in the region. Treatments include prescribed fire, mechanical fuel reductions, and chemical fuel reductions. Treatments have ranged from less than five acres to over 3,000 acres in the past. These treatments are ongoing and individually evaluated under NEPA requirements for environmental effects. Individual projects are not listed under this entry due to the extensive number of projects involved.			
	Location: The locations of the vegetation treatments considered to have potential cumulative effects on various resources are generally within 15 miles of the Proposed Project area.			

4.17.2 Cumulative Impacts by Resource

Physical Resources

Air Quality

The construction phase of the Proposed Project would result in some release of dust and particulates into the atmosphere due to surface disturbance during road building, facility construction, and cement mixing. However, these impacts would be temporary and site specific. The cumulative impact would be less than slight when considered within the context of other projects in the vicinity of the Proposed Project or throughout the southern Idaho. The operation of the Proposed Project would not result in any measurable impacts to air quality and would not affect Cassia County's attainment status. Therefore, the Proposed Project would not result in cumulative impacts to air quality.

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. The Proposed Project would not result in cumulative impacts to geologic hazards.

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 and the communication site at the summit have 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 as a result of the Proposed Project would be expected to be negligible. Therefore, the Proposed Project will not result in cumulative impacts to soils.

Water Resources

The region of influence for this analysis of cumulative impacts is defined by the existing highways. The northern and eastern boundaries are defined by SH-81 and the southern and western boundaries are defined by SH-77. This region was selected because it surrounds the Proposed Project area. Cumulative impacts that could arise from the Proposed Project in concert with other projects would likely only be detectable within the region. Outside this region, cumulative impacts to water quantity and quality that result from the Proposed Project in addition to other projects would not be detectable or attributable to the Proposed Project.

The past and current trends of water resources within the region have been impacted by non-point source pollutants such as agricultural runoff and sediment. These impacts are tied to historic and

current land use within the region. Past projects including road development, development of springs and wells, and other ground-disturbing activities may have impacted water resources in the area.

Future anticipated trends of land use patterns within the region are not expected to change drastically. Limited residential development may occur in Albion Valley and those lands associated with Marsh Creek. These developments are not expected to appreciably impact water quality within the region.

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – The Proposed Project would use BMP to avoid impacts to 303(d) listed streams and other water resources. If future ROW are granted that allow ground-disturbing projects, BMP will also be applied. Therefore, cumulative impacts to water resources are not expected.

Alternative C – The cumulative impacts to water resources will be the same as Alternative B.

Alternative D – The cumulative impacts to water resources will be the same as Alternative B.

Noise

The region of influence considered for the analysis of cumulative impacts resulting from noise associated with the Proposed Project is Cassia County. This area was selected because noise that occurs as a result of the Proposed Project could have a cumulative effect when considered in concert with other projects in the county. The Proposed Project would not contribute cumulatively to noise impacts resulting from projects outside the county.

The past and current trends of cumulative impacts from noise include past projects including road development, the communication site development, and other projects using heaving machinery may have impacted noise levels. Noise in the region has been generated largely from traffic and construction activities. Impacts are generally site specific and temporary within the region, except for in the city of Burley where traffic noise is more constant.

The future anticipated trends of noise within the region are not anticipated to change drastically. About 60% of the new residents of Cassia County are expected to settle in or around one of the established communities in the next few years. The bulk of the remainder of the new residents are expected to seek housing in the areas along the Snake River and in "Country Living" environments in the rural areas of the county (Cassia County Comprehensive Plan 1992). The community of Albion will likely experience limited growth in population and will remain an important community for recreational users to obtain lodging, supplies, and food.

County planners in the region will continue to evaluate industrial and commercial project proposals as efforts to diversify the economy. Increased development of Burley and construction of small-scale structures elsewhere within the region of influence are anticipated.

The agricultural industry has the largest influence on noise levels within the region. Seasonal harvest and transport of crops require operation of heavy machinery. The machinery is audible as it travels from fields to processing, packaging, and distribution facilities. Construction projects involving roads, houses, and general infrastructure also contribute to noise levels within the region. Heavy machinery operation during construction creates noise at local scales.

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – Noise levels within the region would be affected during the construction phase of the Proposed Project. Construction activities would include the use of explosives and heavy equipment. Blasting would be audible from some areas within the region. While heavy equipment would not be audible from outside the Proposed Project Area, traffic associated with travel to and from the project site would increase within the region. The sound of explosives and increased noise from traffic could have a cumulative impact if these sounds were heard in concert with heavy equipment traffic associated with other projects within the region. These impacts would be temporary and would cease once the construction phase was completed. There would be no cumulative impacts to noise from the operational phase of the Proposed Project.

Alternative C – The impacts associated with the construction phase of the Proposed Project area would be similar but slightly less than Alternative B. The construction period would be shorter under this alternative because there would be fewer turbines, roads, and substations constructed compared to Alternative B. There would be no cumulative impacts to noise from the operational phase of the Proposed Project.

Alternative D – The impacts associated with the construction phase of the Proposed Project Area would be similar but slightly less than either Alternative B or C. The construction period would be shorter under this alternative because there would be fewer turbines and roads compared to either Alternative B or C. There would be no cumulative impacts to noise from the operational phase of the Proposed Project.

Hazardous Materials

The Proposed Project would not generate or use any hazardous materials. Therefore, there would be no cumulative impacts expected from the Proposed Project.

Biological Resources

Vegetation

The region of influence includes both Cassia and Minidoka Counties. This region was selected based on the primary influences to vegetation (invasive species, recreation, fire, and livestock grazing) and regional impacts.

The past and current trends of vegetation include grassland, shrub steppe, and juniper communities that have historically been the dominant upland vegetative communities in the Snake River Plains and surrounding highlands (Gibbs 1976; Vale 1975; Townsend 1839). However, a variety of human activities, such as conversion to agricultural or urban uses, livestock grazing, recreation, and the introduction and spread of invasive species and noxious weeds, have combined to alter the structural and functional components of these systems overtime (Sheley *et al.* 1999; Vitousek *et al.* 1996; Anderson and Holte 1980). The culmination of these activities has been the augmentation of fuel loads from annual grasses, and the subsequent change in fire regimes, resulting in an enhanced rate of degradation throughout the region (Pellant 1990; Peters and Bunting 1992). The remnant shrub communities are generally fragmented with understories dominated by annual grass, which increases their risk for fire and further conversion to exotic annual dominated communities (Sheley *et al.* 1999). While native perennial communities persist within the Snake River Plains, their populations continue to have an overall downward trend.

Future trends associated with vegetation are: increased public awareness and education of grassland, shrub-steppe, and juniper ecosystems; proactive recreation, transportation, fuels, and weed management plans and programs; and increased emphasis on rehabilitation and restoration of degraded or disturbed sites toward a more natural status. Based on the current population trends and future population growth, there would be a need for greater access to natural resources for recreation and development. In many cases, increased users and reduced resource availability would further intensify adverse impacts to vegetation throughout the region. Conservation measures would need to increase at a rate equal to or greater than consumption in order to maintain or improve the condition of remnant grassland and shrub steppe communities. In addition, if upland vegetation communities could be maintained or improved through proactive management practices, the genetic interchange and long-term viability of special status plant species that occur throughout the region could also be improved.

Regional influences include population increases where the number of users and type of uses on public, state, private, and other lands is also likely to increase. In many cases, increased users and reduced resource availability would further intensify impacts to vegetation throughout the region. The loss of upland vegetation and special status plant species in the region could include impacts from projects such as: the construction and maintenance of I-84; vegetation treatments; rural development; agricultural development that removes shrub steppe habitat; wildfire and prescribed burning; construction of transmission lines; livestock water developments; and removal of riparian vegetation. Adverse impacts associated with increased consumptive uses (development, livestock grazing, recreation, and other soil disturbing activities) in and around the region could include increased concentration from livestock and wildlife, altered fire regimes, and increased populations of invasive species and noxious weeds. In addition, agricultural practices, including the application of herbicides and pesticides could also impact vegetation in the region. This would lead to an overall impact to upland vegetation in the region and a continuation of the current downward trends of vegetation health in the region.

Increased emphasis on rehabilitation and restoration for habitat protection (sage-grouse, big game etc.), as well as incentives for private restoration and increased public awareness of invasive species and noxious weeds, would also have a cumulative impact to vegetation. As recreation needs increase and desirable resources become increasingly limited for public use, the probability of the public becoming more aware of, and more educated on, resource issues would be likely to increase. The result may be an increase in public complaints associated with consumptive resources uses and a shift in management strategy. In addition, agricultural lands adjacent to the Proposed Project area may eventually be developed for rural residential or commercial properties. If this occurs, the amount of wildland urban interface around the project area would increase. Management practices associated with the wildland urban interface of public lands, fire suppression, fuels treatments, and stabilization and rehabilitation efforts would need to be enhanced. These efforts would have cumulative impacts on vegetation in addition to restoration projects and increased education.

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – Based on the total number of acres of vegetation potentially affected within the Proposed Project area, in culmination with regional impacts, this alternative would likely result in the greatest overall cumulative impacts to vegetation. The direct number of acres affected from the Proposed Project is small in relationship to all other current and future actions that could affect vegetation throughout the region.

Indirect impacts to vegetation from soil disturbance and the improved public access to portions of Cotterel Mountain could increase the potential for the establishment and spread of invasive and noxious weed species. If invasive and noxious weed species expand their range within the Proposed Project area this would result in a further downward trend in vegetation health within the region.

Alternative C – Based on the total number of acres affected, the impacts to vegetation would be the same as Alternative B, as would the regional impacts. Therefore, overall cumulative impacts to vegetation would be the same as Alternative B.

Alternative D – The total number of acres affected would be the least under this alternative. The regional impacts to vegetation would be the same as the other alternatives. Therefore, the overall cumulative impacts to vegetation within the region would be less than Alternatives B or C.

Wildlife and Special Status Animal Species

Each region of influence varies greatly between different species. For highly mobile species (birds, bats, and raptors), the region of influence for cumulative impacts would need to be analyzed throughout their entire home range, including where they migrate from and where they are migrating to. Specific data are not available regarding highly mobile wildlife species found or observed at Cotterel Mountain. This could lead to a potentially enormous scale of cumulative impacts analysis. It is not possible to define all projects and potential actions that could have a cumulative impact for the

highly mobile species of Cotterel Mountain. Therefore, a region of influence will not be defined for highly mobile species; however, cumulative affects resulting from proposed regional wind power facilities are analyzed. For the less mobile wildlife species, the region of influence is defined as Cassia County.

The majority of species represented under big game, amphibians and reptiles, small mammals, birds and bats, and raptors are generally widespread with stable populations. Mule deer and American pronghorn are ranked as demonstrably widespread, abundant, and secure throughout their entire range (Streubel 2000). Bighorn sheep and Mountain lions are not rare, and apparently secure, but with some cause for long-term concern based on Idaho conservation status ranking. Each species exists in relatively high abundance throughout its range, which includes many parts of Idaho and the West. Various resident and migratory birds, bats, amphibians, reptiles, raptors, and small mammal species use Cotterel Mountain and the surrounding region; all species are lumped into appropriate groups and analyzed within the county. If a regional project impacts a particular species individually, it is addressed.

The past and current trends of wildlife and special status animal species include mule deer populations in Idaho that have been decreasing since 1996, primarily due to habitat reduction, specifically critical winter habitat. Mountain lion population densities are usually not more than three to four animals per 40 square miles; actual densities in Cassia County are unknown. In February of 2000 and 2001 the IDFG, BLM, and The Foundation for North American Wild Sheep reintroduced 45 California bighorn sheep into the Jim Sage Mountains. The reintroduced bighorn sheep herd has since increased to about 75 individuals.

Regional trend data are not available for each species group addressed for the proposed Cotterel Mountain wind power facility. Addressing each species individually would be enormous in scope and not comply with the purposes of this section. Grassland and shrub steppe communities have been consistently degrading due to a variety of human activities, such as conversion to agricultural or urban uses, livestock grazing, recreation, and the introduction and spread of invasive species and noxious weeds. Wildlife habitat quality has been historically downsized and fragmented with large contiguous patches of exotic annual species. Downward trends in habitat availability and quality have subsequently resulted in downward trends for some species.

The future anticipated trends of wildlife and special status animal species include high quality, relatively undisturbed big game winter range as 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. If winter range and other big game preferred habitat types are continually being lost or converted for other uses, the long-term anticipated population trends for most big game species could be a decrease in individuals.

Scientists, in particular, are concerned about the potential cumulative impacts of wind power on species populations if the industry expands to the level expected (USGAO 2005). Many proposed wind power projects are located in areas of large species numbers, as well as migratory flyways. The USFWS and USGS are initiating some studies to capture data on migratory flyways to help determine where the most potential harm from wind power might occur and to gather data for use in assessing cumulative impacts on wildlife species from wind power facilities. As these studies are completed and more is known about the impacts of new wind power facilities, predicting future anticipated trends should be more conclusive.

Regional influences to big game include cumulative impacts to big game from regional projects that have occurred within the Cassia Creek, Raft River and Marsh Creek sub-basins. These 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. There are also a multitude of smaller regional projects, such as feedlots, gravel pits, quarry expansions, rangeland improvement projects, livestock exclosures and geothermal exploration that contribute to cumulative impacts. Local impacts to certain wildlife species may take place at the site of each project as a result of habitat loss and disturbance.

Existing and foreseeable impacts to wildlife occurring within the Cassia Creek, 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.

ITD road and bridge improvement projects in the region are anticipated to increase highway use and speed levels in the vicinity of Cotterel Mountain. Completion of these road reconstruction projects 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 displacement related to noise and human disturbance, are difficult to quantify, but probably would increase the overall level of cumulative impacts to big game habitat, over the long-term.

The construction and operation of confined animal feeding operations (CAFO's; typically feedlots or dairies) are proposed in the Raft River Valley. The location and range of use would be the determining factor as to the potential impacts on big game. If these operations are built on existing stands of sagebrush or preferred big game habitat, the impacts could be slight and local.

Several other wind power projects are proposed for southern Idaho along the Snake River Plain. The size of the footprint and vicinity to preferred big game habitat would determine the level of potential impacts resulting from these projects.

Upgrades to infrastructure, such as roads and utilities, are anticipated within the region. Rangeland improvement projects, such as livestock watering tanks, fences, and cattle guards, are also expected to be constructed within the region. The subsequent impacts to big game as a result of these actions are difficult to predict. Potential impacts depend on their vicinity to big game habitat and species locations, as well as the indirect impacts that could accompany them, such as increased grazing or road use.

Amphibians and Reptiles

Regional cumulative impact to amphibian and reptile habitats and individuals include 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. Impacts to amphibious species will be determined by the amount of riparian and wetlands habitat that is sacrificed by any of the regional projects. Increasing local roads and widening highways will increase traffic levels and may result in higher reptilian mortality due to their attraction to warm surfaces. By implementing prompt re-vegetation and appropriate habitat protection measures following construction, cumulative impacts to amphibian and reptile populations within the region would be expected to be negligible. Amphibians and reptiles could be subject to minor cumulative impacts that result from permanent land use changes that reduce available habitat and open space; however, the impacts are anticipated to be negligible.

Small Mammals

Regional cumulative impact to small mammal habitats and individuals include 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 re-vegetation 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 region may increase roadway mortality of small mammals. Small mammals could be subject to minor cumulative impacts that result from permanent land use changes that reduce available habitat and open space; however, the impacts are anticipated to be negligible.

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. Domestic cats, collisions with vehicles, buildings and windows, and communication towers each kill over one million birds every year in the

U.S. A study in 2001 showed that all of the operating wind projects in the U.S. were estimated to kill 10,000 to 40,000 birds per year (Erickson *et al.* 2001b), roughly 80 percent of which were 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 less frequently than birds. Recent evidence indicates that wind turbines can kill bats, especially those species that 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 in the region. However, the number of operating wind projects is expected to increase in the future, potentially increasing cumulative impacts to birds and bats.

Raptors

It is generally assumed that regional populations of common raptors are widely distributed and stable (Olendorff 1973; Newton 1979). During spring, the 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 expected to be negligible.

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – Road construction and improvements associated with the Proposed Project in combination with regional impacts would contribute to cumulative impacts to wildlife and special status animals. Increased motorized travel and recreational accessibility in the region and from the Proposed Project would result in more disturbances (visual, auditory) within wildlife habitat.

Various other wind power facilities proposed in the region in combination with impacts from the Proposed Project could pose a cumulative threat to avian and bat species. Passerine and bat species could be the most impacted. 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.

This alternative could have more of a cumulative impact on avian and bat species due to the larger number of turbines across a broader landscape. The cumulative impact between the Proposed Project

and other wind power projects in the region will be dependant on the layout and design of the other projects, as well as species use, habitat types, and migration/movement corridors in relation to these sites.

Alternative C – Cumulative impacts to wildlife resulting from road and highway improvements would be the same as those described for Alternative B even though fewer roads would be constructed under this alternative and there would likely be fewer subsequent motorized vehicle impacts (disturbance and road kill).

Cumulative impacts to birds and bats resulting from various other wind proposed power projects in concert with the Proposed Project would be the same as Alternative B.

Smaller region wide projects such as feedlots, gravel pits, quarry expansions, rangeland improvement projects, livestock exclosures and geothermal exploration would have the same cumulative impact as Alternative B.

Alternative D – Cumulative impacts to wildlife associated with increased access and motorized travel resulting from the Proposed Project would be similar but less widespread than those described under either Alternative B or C because there would be fewer miles of roads constructed under this Alternative.

Cumulative impacts to birds and bats resulting from various other proposed wind power facilities would be similar to Alternative B. However, the reduced number of turbines under this alternative could reduce the cumulative impact region wide as a result of fewer collision mortalities and less destruction of suitable habitat.

Smaller region wide projects such as feedlots, gravel pits, quarry expansions, rangeland improvement projects, livestock exclosures and geothermal exploration would have the same cumulative impact as Alternative B.

Threatened or Endangered Species (Bald Eagle and Gray Wolf)

The region of influence for his section addresses general actions in the region that may have cumulative impacts on bald eagle or gray wolves. Threatened and endangered species are usually analyzed at a population-wide scale in an effort to determine if individual projects or actions will inhibit the long-term recovery of either species. Determining all actions and projects that are occurring within bald eagle and gray wolf occupied areas is outside the scope of this analysis.

The past and current trends of the bald eagle include a National Audubon Society survey in 1963 that reported only 417 active nests in the lower 48 states. In 1994, about 4,450 occupied breeding areas were reported. There has been a 47 percent increase since 1990 in the number of occupied breeding territories (USFWS 1994). The number of known occupied nesting territories in Idaho has increased from 11 in 1979 to 138 in 2000 (Beals and Melquist 2001). In 1994, the bald eagle was downlisted

from endangered to threatened status. The species is currently being considered for de-listing from the federal list of endangered and threatened wildlife (60 FR 36010).

The past and current trends of the gray wolf include a mandate by the State of Idaho as early as 1907 that sought the extermination of predators. By 1910, control efforts were coordinated among government trappers and stockmen to eliminate wolves and other predators from Idaho. Kaminski and Boss (1981) reported that U.S. Biological Survey reports indicated that the last wolves were removed from Idaho by about 1936. However, historical evidence (1905-1980) and recent wolf observations (1980-1996) demonstrate that a sparse but stable population of wolves has remained in remote, forested portions of Idaho. In 1996 gray wolves were released in the central Idaho mountains. Since 1996, the gray wolf population has grown to an estimated 500 individuals within Idaho.

The future anticipated trends of the bald eagle are that they are being evaluated for de-listing from the federal list of endangered and threatened wildlife (60 FR 36010); it is anticipated that bald eagle population numbers will continue to be stable or increasing.

The future anticipated trends of the Gray Wolf are that the gray wolf numbers and territory size in Idaho will continue to increase in numbers and size. As gray wolf populations increase in Idaho, human interaction with the species will increase as well, likely amplifying depredation issues. However, as social interactions intensify between wolves as population density increases, and at some level, social factors interact with food competition, which would reduce or prevent population growth (Packard and Mech 1980, Keith 1983, Fuller 1989). Human predation and a potential hunting season for gray wolves could help to manage the population.

Regional influences to bald eagle include several other wind power projects proposed in southern Idaho; some of these projects are located near higher densities of bald eagles. To date there has not been a documented bald eagle mortality resulting from wind power; however, constructing a facility near concentrations of bald eagles increases the potential for mortality to occur.

Proposed wind power projects located near bald eagle winter roost, nesting and foraging areas have the potential to result in cumulative impacts to bald eagles in Idaho due to higher population densities. The number, scale, and location of wind power projects will determine the level of potential impact. If several wind power projects are constructed near concentrated bald eagle forage or roost sites, the potential for adverse impacts would increase.

Windland is proposing to construct an approximately 200 MW wind energy project six to 12 miles south of American Falls. An important bald eagle communal roost site at Bowen Canyon is located one to two miles southwest of this site. Suitable bald eagle habitat does not exist at the proposed wind power location. However, bald eagles flying between the communal roost sites and potential foraging areas along the Snake River or American Falls Reservoir could pass through the proposed wind facility and would potentially be at risk of collision. If future wind power projects were developed at

relative high densities along the Snake River or other open water areas in the region, the potential for bald eagle fatalities would increase.

Other proposed county projects such as ITD road and bridge improvement projects on regional and local roadways, large CAFO's, and upgrades to infrastructure, are not anticipated to have a cumulative impact on bald eagles and gray wolves.

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – Constructing proposed wind power facilities near concentrations of bald eagle forage or roost sites along the Snake River increases the potential for injury or mortality to occur. However, long-term regional cumulative impacts are not anticipated to inhibit the ongoing recovery and increasing populations of bald eagles in Idaho or range wide.

Alternative C – Cumulative impacts would be the same as Alternative B.

Alternative D – Cumulative impacts would be the same as Alternative B.

Greater Sage-Grouse

The region of influence for sage-grouse is Cotterel Mountain and its immediate vicinity including the Albion and Declo Hills to the north. Mt. Harrison to the west, SH-81 to the east and Cassia Creek to the south. Sage-grouse present on Cotterel Mountain and in its vicinity represent a small population with low numbers of grouse present per lek. The results of a radio telemetry study of the Cotterel Mountain grouse population indicates that these sage-grouse do not breed with sage-grouse found off of the mountain. Following the breeding season, grouse from Cotterel Mountain do travel to other sites within the region. Therefore, Cassia County will represent the region of influence for Cotterel Mountain sage-grouse to allow comparison of lek trend data within in the county.

The past and current trends of sage-grouse according to the Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats (2004), it is estimated that statewide there are 772 active leks and 5,684,900 acres of key sage-grouse habitat. 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).

In Idaho, recent sage-grouse 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). On Cotterel Mountain, three years of monitoring has revealed that at least six sage-grouse leks are currently active or occasionally active (Reynolds 2005). 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 not changed. For the ten years prior to this period, there were declining lek attendance trends.

The future anticipated trends of sage-grouse are that if current levels of habitat loss occur into the future across the entire western sage-grouse habitat range, populations are anticipated to maintain the current declining levels in Idaho and throughout the West.

Regional influences to 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.

Historic events that have impacted sage-grouse in the Proposed Project area and its vicinity include: conversion of native vegetation to agriculture; wildfire; prescribed burns; construction of I-84; construction of county, state, federal, and other local roads; livestock grazing, water development, and fencing on private or public lands; rural development; construction of electrical transmission lines; construction of natural gas and gasoline pipelines; mining; water channel alterations; irrigation channels and laterals; drought; hunting; and disease.

The continuing loss and fragmentation of sagebrush habitat in the region has reduced the number of potential sites where 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. An extended discussion of these events can be found in the Conservation Plan for the Greater Sage-Grouse in Idaho (2005).

ITD road and bridge improvement projects on regional and local roadways are not anticipated to have an additive impact on regional Greater sage-grouse habitat or population trends.

The construction and operation of large CAFO's (8,000-10,000 head of livestock per feedlot or dairy) are proposed in the Raft River Valley. The location and range of use would be the determining factor as to the subsequent potential impacts on sage-grouse. If these operations are built on existing stands of sagebrush they could add to the overall loss of potential sage-grouse habitat.

As with all other wildlife species, there is a concern regarding the cumulative impact on sage-grouse resulting from the construction of wind power facilities. Currently, there are Several other wind power projects proposed for southern Idaho along the Snake River Plain. The site specific location of these facilities with regard to sage-grouse habitat and leks would determine the potential level of impact at the local scale. Ongoing displacement of sage-grouse across the region could lead to less lek availability and attendance, ultimately resulting in reduced sage-grouse reproduction. Ongoing

monitoring and studies would be required as these facilities come online to determine the potential level of the regional impact to sage-grouse.

Upgrades to infrastructure, such as roads and utilities, are anticipated and rangeland improvement projects such as, livestock watering tanks, fences, and cattle guards, are expected to be constructed within the region. The subsequent impacts to sage-grouse as a result of these actions are difficult to predict. Potential impacts depend on their vicinity to sage-grouse habitat and species locations, as well as the indirect impacts that could accompany them, such as increased grazing, road use, or human presence.

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – This alternative would result in the largest project footprint, it is estimated that sage-grouse could potentially be displaced from about 26,644 acres of potentially suitable habitat in the Proposed Project area. This displacement from potentially suitable habitat would represent less than one-half of one percent (0.5%) loss to the total estimated acres of suitable sage-grouse habitat statewide.

The construction of the Proposed Project alone would result in only a small loss of sage-grouse habitat statewide. However, the construction of the Proposed Project, in conjunction with the development of other wind energy, land conversion, or other projects or actions that result in the degradation or removal of sage-grouse habitat could result in adverse cumulative impacts to sage-grouse in the region.

Alternative C – Cumulative impacts are anticipated to be the same as Alternative B.

Alternative D – The types of cumulative impacts are anticipated to be the same as Alternative B; however, under this alternative there are the fewest proposed turbines and the smallest project footprint. The reduced footprint size would avoid two known active sage-grouse lek sites on the southern reach of Cotterel Mountain, resulting in less potential for cumulative impacts to sage-grouse than under Alternatives B and C.

Historical and Cultural Resources

The region of influence for historical and cultural resources is the Raft River Region of the Snake River Plain.

The past and current trends of historical and cultural resources cannot be quantified because most of the region has not been inventoried for cultural resources. There is potential for cultural resource occurrence in unsurveyed areas, but until surveys are completed, the presence and/or significance of resources and their cumulative impacts cannot be determined.

The future anticipated trends of historical and cultural resources are human activities associated with population growth, which could potentially increase all types of recreational and development-related activities resulting in disturbed cultural resources.

Regional influences include past projects or planned projects in the area that 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 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 occur through natural erosion and weathering of lands containing archaeological sites.

Surface disturbing activities associated with regional population growth and the resulting development would adversely affect cultural resources on non-federal lands. In addition to surface disturbing activities, increased recreation use would result in more human use in areas that could support cultural resources. This would result in an increase in the likelihood of cultural resources being disturbed.

Increased demand for surface disturbing activities, such as road and utility ROW on federal land, require cultural resource inventories prior to authorizing the activity. These inventories should reduce the impacts to cultural resources in the region. The loss of native vegetation, and changing viewshed could also have adverse impacts on traditional cultural properties.

Alternative A – There would be no action under this alternative and no cumulative impacts.

Alternative B – Cumulative impacts to historical and cultural resources from regional projects and the Proposed Project may include the disturbance and loss of unidentified cultural resources that could add to knowledge about past use of the area. An increase in visitation to these areas may result in vandalism to archaeological resources. Gains in scientific knowledge through the discovery of new sites identified by construction and maintenance crews and the general public due to an expected increase in visitation to the area, would add to the cumulative impact.

Alternative C – Under Alternative C the potential cumulative impacts to cultural resources would be the same as under alternative B.

Alternative D – The potential cumulative impacts to cultural resources would less than those potentially occurring under Alternative B or C. Under Alternative D no turbines would be sited along the east ridgeline of Cotterel Mountain and no road improvements would occur in this area. Because of this, there would likely be less visitation to east ridgeline portion of Cotterel Mountain reducing the

potential for vandalism to archaeological resources in this area. However, there would be fewer opportunities for gains in scientific knowledge through the discovery of new sites due to the smaller footprint.

Lands & Realty

The region of influence for lands and realty is a polygon with its northern most point located at Minidoka Dam. From there, a straight line to the peak of North Chapin Mountain defines the northeastern boarder. Moving further south, the eastern boundary is defined by a straight line between North Chapin Mountain and Black Pine Peak. Black Pine Peak is the furthest southern point. A straight line between Black Pine Peak and Jim Sage Mountain Peak defines the southern boundary. A straight line between Jim Sage Mountain Peak and the town of Burley defines the southwestern boundary. Finally, the polygon is defined along its northwestern edge by a straight line between the town of Burley and the Minidoka Dam.

This area was selected because structures and activities associated with the operation and/or construction of the Proposed Project would likely be visible by the casual observer. The perception of the Proposed Project by resident landowners, in concert with other projects in the region, could have incremental impacts to property values within the region. Outside the region, the Proposed Project would not likely be noticeable by the casual observer and would have no impact to land and realty values.

The past and current trends of land and realty include the number of land use authorizations, particularly ROW and permits that have a function of demand for these uses. ROW and permits have generally been issued for recreation, transmission lines, and mineral use. Rights of way have been granted for two utility operators (Bonneville Power Administration and Raft River Rural Electric Cooperative, Inc.) within the region who each operate electrical transmission lines. The USFS has issued a long-term recreational use permit for Pomerelle Mountain Resort where ski lifts, trails, and associated facilities are maintained. There has been a demand for mineral use in the region for building material. The BLM has provided use permits to meet this demand and is currently evaluating additional mineral use permits.

The future anticipated trends are that conditions within the region are not anticipated to change drastically. About 60% of the new residents of Cassia County are expected to settle in or around one of the established communities in the next few years. The bulk of the remainder of the new residents are expected to seek housing in the areas along the Snake River and in "Country Living" environments in the rural areas of the county (Cassia County Comprehensive Plan 1992). The small community of Albion will likely experience limited growth in population.

County planners in the region will continue to evaluate industrial and commercial project proposals as efforts to diversify the economy continue. Increased development of Burley and construction of small-scale structures elsewhere within the region are anticipated.

Several factors influence lands and realty within the region. The three primary factors are ownership, land use, and monetary value. These factors are interrelated and are best considered in a relational context. Ownership within the region is distributed among private, state, and Federal interests. In general, private lands are contiguous along the flatter, more arable areas. Federal lands are scattered across the steeper areas. State lands are isolated and scattered throughout the region.

Ownership and land use are related in that private lands are generally utilized for agriculture, and residential development. Within the region of influence, agriculture is the dominant use of land by private interests; however, rural development is anticipated to increase in the future. Federal and state lands are utilized by the public for various resource benefits, such as livestock grazing, mining, recreation, and wildlife habitat.

The value of privately held real estate fluctuates in part based on its intrinsic properties and the condition of adjacent parcels. As land use within the region changes from agricultural to rural residential, the monetary value of privately held lands will likely increase. Privately held parcels that are adjacent to public lands may be of greater monetary value due to the proximity of resources available. For example, private parcels that have easy access to public lands may have easy access to recreational uses such as hunting. This condition may affect the value of privately held real estate conversely. For example, real estate values adjacent to public land may be adversely affected by resource extraction activities that the property owner does not financially benefit from (e.g., right-of-way development, mining operations, timber harvest).

Alternative A – There would be no action under this alternative and no cumulative impacts to lands and realty.

Alternative B – There could be some impact to the value of residential properties based on visual aesthetics. This impact would be adverse if residents, or potential residents who would purchase a home, found viewing the wind turbines and rotors to be disagreeable. Residential property in and around the communities of Malta and Albion would likely experience alterations of visual aesthetics associated with their properties. The Proposed Project would impact the view that some landowners currently experience from their property over the long-term. Other unassociated foreseeable projects in the region would not likely contribute cumulatively to the alteration of visual aesthetics experienced by local property owners.

There could be cumulative short-term impacts to residential property in terms of noise experienced from increased traffic from industrial construction vehicles used to complete the Proposed Project and other foreseeable projects within the region. Impacts associated with increased traffic would be temporary, ceasing after construction is completed.

Alternative C – The impact to the value of property based on alteration of visual aesthetics would be similar but less widespread than under Alternative B. There would be 32 to 49 fewer turbines

constructed under this alternative. Overall, turbines associated with the Proposed Project under this alternative would be less visible than under Alternative B.

Cumulative short-term impacts from the noise that residential property owners experience would be similar but of shorter duration than those described under Alternative B because there would be less construction associated with the Proposed Project.

Alternative D – The impact to the value of residential property based on alteration of visual aesthetics would be similar but less widespread than under either Alternative B or C. There would be 48 to 64 fewer turbines constructed under this alternative compared to Alternative B. Cumulative impacts from turbines associated with the Proposed Project under this alternative would be less visible than either Alternative B or C.

Short-term cumulative impacts from the noise that residential property owners experience would be similar but of shorter duration than those described under either Alternative B or C due to less construction.

Livestock Grazing

The region of influence for livestock grazing impacts would include both Cassia and Minidoka Counties. Impacts associated with livestock grazing are primarily socio-economic; therefore, it is reasonable to identify this as the region of influence for cumulative impacts.

The past and current trends of livestock grazing started with grazing in and around the Albion area as early as 1836 (Gibbs 1976; Townsend 1839). Reoccurring drought conditions combined with severe overuse resulted in degraded range conditions in the early part of the century (Vale 1975). However, improved range management and incorporation of grazing systems has improved range conditions over time (Vale 1975). Currently, livestock grazing on public lands in the region is monitored and managed under the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management, in accordance with 43 CFR 4180 2 (b). Livestock grazing is also present on state, private, and other lands in the region. However, the number of publicly grazed acres is greater than all of these combined.

The Albion Valley and Pomerelle Mountain Resort, combined with the City of Rocks are sought after rural recreation areas in the region. The demand for land associated with recreation along with rural residential, and commercial property development is expected to increase over time. Impacts to vegetation and other livestock grazing resources from land development and recreation needs, including expanded transportation corridors, are likely to increase. As these types of resources uses increase, private and public needs are likely to shift.

Regional influences to livestock grazing include increased recreational, residential, and commercial land uses in Cassia and Minidoka Counties, which would likely shift resource needs. The overall

effects of these changes could result in long-term reductions in livestock use of public lands in the region.

The increased population growth resulting in increased use of public lands in surrounding communities could lead to more human caused wildfires (Peters and Bunting 1992), escalated dispersal of invasive species and noxious weeds (Sheley *et al* 1999), and increased degradation of native plant communities, including special status plant species (Jones 2000). In the absence of intensive restoration, the overall conditions within and adjacent to the region could decline appreciably, resulting in reduced available forage and potential grazing restrictions/exclusions related to reduced rangeland health.

Alternative A – The overall impacts to livestock grazing on public lands from regional influences would be consistent under all four alternatives. However, the Proposed Project would not be constructed under this alternative and there would be no cumulative impacts to livestock grazing on public lands.

Alternative B – Based on the total number of acres potentially affected under this alternative, in addition to regional impact, this alternative would result in the most cumulative impacts to livestock grazing on public lands. However, based on construction-related mitigations and current and future grazing restrictions throughout the region, the cumulative impacts to livestock grazing would be slight.

Alternative C – The cumulative impacts to livestock grazing on public lands within the Proposed Project area would be the same as Alternative B.

Alternative D – The type of impacts to livestock grazing on public lands would be the same as Alternative B, as would the impacts in the region. However, the number of acres affected by construction activities under this alternative would be less and the overall cumulative impacts to livestock grazing on public lands would be less than Alternative B.

Socioeconomics

The region of influence for the analysis of socioeconomic cumulative impacts will include Cassia and Minidoka counties, combined. This region was selected because the Proposed Project is located within these counties and the majority of induced and indirect social and economic impacts would occur there. Past, present, and future projects could have an incremental impact on social and economic conditions within the region. Social and economic impacts that occur as a result of projects, or actions outside of the region of influence would not likely affect social and economic conditions within Cassia and Minidoka counties to a greater degree than other parts of Idaho.

For a description of past and current trends within the region, please refer back the detailed socioeconomic discussion in Sections 3.5.1 through 3.5.6 of this document.

Future anticipated trends include population and land use within the region, which will likely change in accordance with recent trends throughout the western U.S. The abundance of recreational opportunities and relatively inexpensive real estate make the region attractive for rural development. The community of Albion will likely experience limited population growth and will likely become a more important community for visitors to the area to obtain lodging, supplies, and food. The Albion economy will rely less on agriculture as it expands its service-based economy. However, agriculture will remain the dominant industry throughout the region. County planners in the region will continue to evaluate industrial and commercial project proposals as efforts to diversify the local economy. Increased development of Burley and construction of small-scale structures elsewhere within the region are anticipated.

Regional influences include projects that employ local residents and increase the viability of the local economy. Generally, unemployment decreases, the ripple effect creates additional jobs and income, and the tax base is increased. It is likely that many of the foreseeable projects within the region would increase local employment to some degree, however the measurable effect is unknown because the number of available jobs and the proportion of locals that would be employed is unknown.

The largest sectors of the economy in the region are currently associated with manufacturing, agriculture (including fishing and hunting), and retail trade (see Table 3.5-4). Closure of the J.R. Simplot food processing facility in 2004 increased the unemployment rate of the region. It is unknown if the foreseeable future projects would result in any measurable cumulative impacts to social and economic conditions when considered with the Proposed Project. Trends within the region may result in an increase in property values and more rural development. The construction of the Proposed Project would not likely impact property values (ECONorthwest 2002).

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – Operation of the Proposed Project would increase the tax revenue that Cassia Joint School District No. 151 receives annually. As a result, the State of Idaho would remove financial support that is currently provided to the School District and it would replace these funds through the state property tax replacement system. The funds previously earmarked by the state for the financial assistance of Cassia Joint School District No. 151 may become available for financial assistance of other school districts in the region. Overall, this would have a positive cumulative impact to school districts in the State of Idaho (Times News 2004).

Alternative C – Under Alternative C, the amount of tax revenue collected by Cassia County would be similar to Alternative B and the cumulative impacts would be similar.

Alternative D – Under Alternative D, the accrued tax revenue for Cassia County would be less than under Alternatives B and C and the cumulative impact to regional school districts would be similar but less than those described under Alternative B.

Recreation

The region of influence that is considered for the analysis of cumulative impacts to recreation is Cassia County. This region of influence was selected for because the Proposed Project area is contained completely within Cassia County and the majority of recreation activities that are similar to those available at the Proposed Project site are concentrated in Cassia County.

Projects within the region contribute to the quality and opportunity for recreation potentially causing recreational activities to be substituted or relocated to other areas. Impacts from the Proposed Project would be so dispersed that recreational quality and opportunity would not likely be affected.

The past and current trends of recreation have shown that many recreational local users reside in the town of Burley. Areas developed primarily for recreational purposes within the region include the City of Rocks National Reserve, The City of Rocks Backcountry Byway, and Pomerelle Mountain Resort. The region offers a relatively diverse spectrum of recreational opportunities.

Nationwide the popularity of OHV use has been increasing (Motorcycle Industry Council 2003). A representative increase in off-highway motorcycle and OHV use is expected at the regional level. Past road and trail building activities, and the development of other recreational amenities have contributed to increased opportunities for access in the region with a corresponding reduction in opportunities for solitude.

The future anticipated trend is that the demand for all types of recreational experience is expected to increase. This trend will be fueled in part by anticipated growth in the region. A transition in land use of the Albion Valley and Snake River area from agricultural to rural residential may reduce some types of hunting opportunities in specific areas. The demand for hunting grounds will continue to be met by federal, state, and private landowners. Pomerelle Mountain Resort will likely meet developed winter recreation demand. Recreational opportunities are anticipated to remain diverse within the region.

Regional influences on recreation are tied primarily to land use by humans. The general agricultural and rural nature of the area lends itself to opportunities for solitude and quiet. The region has always been mostly rural, except for the town of Burley, which is suburban.

The need for irrigation by farmers in the region has led to the development of reservoirs and lakes. Nearby Lake Walcott, Milner Reservoir and Lower Goose Creek Reservoir provide fishing and boating opportunities. Hunting continues to be a valued recreational opportunity and bird sanctuaries and wildlife refuges within the region provide opportunities for wildlife viewing.

Livestock grazing continues to be a primary land use on rangelands in the region. Rangeland improvement projects and the presence of livestock have some influence on the types of recreational experiences that occur in the region.

Alternative A – There would be no action under this alternative and no associated cumulative impacts.

Alternative B – Road construction and improvements associated with the Proposed Project would contribute cumulatively to impacts from road improvements going on throughout the region. The result would be an overall increase in accessibility opportunities for motorized travel. Motorized recreational opportunities within the Proposed Project area would increase as motorized travel within the region increases. The quality of non-motorized recreational experiences would be adversely impacted where increased accessibility to motorized vehicles resulted in more noise, and less opportunity for solitude. The opportunity for semi-primitive motorized recreation would decrease, with a corresponding increase in opportunities for roaded natural recreation opportunities.

During periods of high use, the campgrounds at the City of Rocks National Reserve are often full. Visitors that do not obtain a campsite may search for appropriate dispersed camping sites within the region, including Cotterel Mountain. Road improvements within the Proposed Project area may attract additional campers if they are not bothered by the presence of the wind turbines. Campers who are bothered by the presence of wind turbines would likely seek dispersed camping opportunities elsewhere, such as other adjacent public lands or choose to stay at hotels available in either Albion, Malta, Almo, or Burley.

Alternative C – Cumulative impacts associated with increased access and motorized travel resulting from the Proposed Project would be less than those described under Alternative B because there would be fewer miles of roads constructed under this alternative.

Increased accessibility for motorized vehicles within the Proposed Project area would have impacts on dispersed camping opportunities similar to those described under Alternative B. There would also be slightly more areas available for dispersed camping under this alternative.

Alternative D – Cumulative impacts associated with increased access and motorized travel resulting from the Proposed Project would be similar but less widespread than those described under either Alternative B or C because there would be fewer miles of roads constructed under this alternative.

Increased accessibility for motorized vehicles within the Proposed Project area would have impacts on dispersed camping opportunities similar to those described under Alternative B. Compared to Alternatives B and C, there would be slightly more areas available for dispersed camping.

Visual Resources

The region of influence for visual resources is based on the Proposed Project being observable to varying degrees depending on three factors of perspective: elevation, aspect, and distance. The Proposed Project would be visible from the north and east at greater distances than the south and west due to the relatively flat Snake River Plain. Regions to the west and south of the Proposed Project area are generally more mountainous than areas northward, with greater obstacles in the line of site.

This trend is the basis for selection of the region of influence, which extends beyond the Snake River Plain into southern portions of Minidoka, Blaine, and western portions of Power County. The Raft River Valley, including the western slopes of the Sublett and Black Pine Mountain Ranges are included. West of the Proposed Project area it includes Albion Valley and eastern slopes of Mount Harrison. The southern extent would take in northern slopes of Jim Sage Mountains, but areas beyond Jim Sage Mountains have geological features that obstruct the line-of-site. This area was selected because structures and activities associated with the operation and/or construction of the Proposed Project would likely be visible by the casual observer.

The past and current trends of visual quality in the region have been impacted by small-scale construction projects of residential, commercial, and industrial nature. Visual quality is worse today than it has been in the past due to construction of these facilities; however, overall character of the landscape has been retained.

Trends within the region are towards slow development of infrastructure. Land use patterns have been traditionally agricultural and remain so today. Structures are sparse across the landscape. When they do occur, they tend to be clumped together such as the communities of Burley or Albion. Infrastructure tends to follow straight north-south lines across this landscape due to orientation of the ridges and valleys.

Existing structures within the region that impact visual resources include SH-81, I-84, and numerous other small roads. Homes and ranches are scattered throughout the region, as well. An existing north-south electrical transmission line is also seen on the west side of SH-81 along with a proliferation of cellular telephone towers and other types of communication facilities, which are seen throughout the region.

The future anticipated trends for visual resources include an overall growth in population in the region and associated infrastructure, which will lead to long-term cumulative impacts to visual resources.

Visual resources within the region are influenced by the conversion of agricultural land to rural residential and commercial development. The density of structures across the landscape will increase over time in the region. Recent construction of a cheese factory in the region has led to an increase in the demand for local dairy. As a result, the potential construction and operation of new dairies on the landscape will influence the visual landscape within the region. Livestock grazing activities continue to influence the visual landscape within the region, including construction and maintenance of fences, cattle guards, and water troughs.

Alternative A – There would be no action under this alternative and no associated cumulative impacts to visual resources.

Alternative B – Several other wind power projects are proposed for southern Idaho along the Snake River Plain. If these projects were 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. 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.

Road construction and operation would contribute to cumulative impacts to visual quality within the region over the long-term. New roads would be visible from the southwest portion of the region of influence. Other roads proposed in the region would contribute to cumulative impacts to visual resources.

Construction and operation of transmission interconnect lines associated with the Proposed Project would increase the visibility of these types of structures. Existing transmission lines within the area have already impacted visual resources. The transmission lines associated with this alternative would be shorter than either Alternative C or D. The transmission lines proposed under this alternative would not parallel any of the existing ones.

Alternative C – Construction of other wind projects currently proposed for southern Idaho along the Snake River Plain would have the same impact as those described under Alternative B. The wind turbines would be slightly less visible because there would be 32 to 49 fewer turbines constructed under this alternative contributing less to the cumulative impacts to visual resources than Alternative B.

Cumulative impacts to visual resources from road construction would be less than those described under Alternative B because there would be fewer miles of new road constructed under this alternative.

Transmission interconnect lines associated with this alternative would contribute less to cumulative impacts than those described under Alternative B because they would parallel an existing north-south transmission line, although the proposed transmission lines would be longer.

Alternative D – Construction of other wind projects currently proposed for southern Idaho along the Snake River Plain would have the same impacts as those described under Alternative B. The wind turbines would be less visible under this alternative than either Alternative B or C because there would be 48 to 64 fewer turbines constructed.

Cumulative impacts to visual resources from road construction would be less than those described under Alternative B or C, because there would be fewer miles of new road constructed under this alternative.

Cumulative impacts to visual resources from the construction and operation of transmission interconnect lines associated with this alternative would be the same as those described under Alternative C.

Fire Management

Cumulative impacts to fire management capabilities are not anticipated because the potential for ignitions, surface fuel alteration, or safety hazards would not change outside the Project Area as a result of the proposed project. Past projects within the proposed project area have not affected fire management capabilities to date and future foreseeable actions are not anticipated to have cumulative impacts on the ability to suppress fire outside the Proposed Project Area.

4.18 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 be 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.

4.19 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 (e.g., forage, wildlife habitat) from lands used for the siting of the Proposed Project features (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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