

3.10 VEGETATION

3.10.1 Overview

This section discusses vegetation cover types, noxious weeds, special status plants, and rangeland health of grazing allotments occurring in the proposed project study area. Vegetation communities in the northern portion of the study area are dominated by coniferous forests intermixed with grasslands, agriculture, and pockets of sagebrush steppe. In the central portion of the study area, vegetation communities transition to one dominated primarily by sagebrush intermixed with fingers of coniferous forests, agricultural lands, shrublands, and grasslands. The drier southern portion of the study area is dominated primarily by sagebrush, with smaller, localized areas of intensive agriculture, as well as vegetated lava fields and grasslands (NorthWestern 2008a).

The seven general vegetation cover types considered for the proposed project are:

- Forests
- Grasslands
- Shrublands (shrub communities other than sagebrush)
- Sagebrush shrublands
- Riparian and wetlands areas
- Sparse vegetation communities
- Anthropogenic communities

3.10.1.1 Ecoregions

The project area is located in the Middle Rockies and Snake River Plain Level III ecoregions (Woods et al. 2002; McGrath et al. 2002). Ecoregions are areas that are relatively homogenous in terms of their climate, geology, physiography, soils, and vegetation. The northern and central portions of the study area are located in the Middle Rockies ecoregion, which is characterized as having a continental climate with long cold winters and short springs (Woods et al. 2002). Vegetation in this ecoregion primarily consists of spruce-fir forests in the mountains and sagebrush steppe and grasslands in the foothills and valleys (Woods et al. 2002; McGrath et al. 2002). However, the majority of the forests in the project area is relatively dry and dominated by Douglas fir, lodgepole pine, and ponderosa pine. The Snake River Plain ecoregion encompasses the southern portion of the study area in Idaho and is primarily comprised of sagebrush steppe, lava fields, agricultural lands, perennial seeded grasslands, and introduced annual grasslands (McGrath et al. 2002). This ecoregion is considered part of the dry intermontane west, with mean annual precipitation in the project area historically ranging from 6 to 16 inches (McGrath et al. 2002).

3.10.1.2 Regulatory Setting

This section discusses federal, state, and agency regulations affecting vegetation resources in the project area.

Federal Regulations

Endangered Species Act of 1973 (ESA). The purpose of the ESA is to provide for programs to conserve the ecosystems of threatened and endangered species. In Montana and Idaho, the USFWS is responsible for the management of plant and animal species listed under the ESA.

The Plant Protection Act of 2000. Title IV of Public Law 106-224, commonly known as the Plant Protection Act, generally supersedes the Federal Noxious Weed Control Act of 1974, as amended. It gives

the Secretary of the USDA the authority to protect agricultural crops through the regulation and control of pests, including noxious weeds.

Executive Order 13112, Invasive Species. Executive Order 13112 was signed to prevent the introduction of invasive species and to provide for their control.

Executive Order 11990, Protection of Wetlands. Executive Order 11990 requires all federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands while carrying out certain agency responsibilities, including:

- Acquiring, managing, and disposing of federal lands and facilities
- Funding construction or improvements
- Conducting activities or programs affecting land use

Executive Order 11990 also provides additional guidance to help agencies implement this initiative.

CFR Title 10, Parts 1021 and 1022, Compliance with Floodplain and Wetland Environmental Review Requirements. This policy provides guidance on procedures for evaluating impacts of proposed actions on floodplains and wetlands.

CFR Title 43, Part 4100, Grazing Administration, Exclusive of Alaska. This regulation establishes the administrative procedures for managing grazing on public lands. Of particular relevance is Subpart 4180, which establishes four fundamentals of rangeland health and provides guidance for establishing state-specific standards and guidelines for maintaining rangeland health.

Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. In August 1997 the Secretary of the Interior approved these resource measures and guidance to ensure healthy, functional rangelands on BLM-administered public lands in Idaho.

Montana Standards for Rangeland Health and Guidelines for Livestock Grazing Management. These policies, practices, and procedures were developed in concert with the Western Regional Advisory Council to ensure that BLM-administered public lands in Montana are healthy.

Bureau of Land Management Special Status Species Management Policy 6840. This policy establishes the management and conservation of sensitive plant and animal species and the ecosystems upon which they depend. Policy 6840 gives the State Director the responsibility of designating BLM-sensitive species.

Forest Service Manual Section 2670. This section delegates the designation of sensitive species to each Regional Forester. Sensitive species are defined as “Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by a significant current or predicted downward trend in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species’ existing distribution.”

State Regulations

Montana Major Facility Siting Act (MFSA). Chapter 20 of Montana Code Annotated (MCA) Title 75 was established by the Montana legislature. The purpose of this legislation is to “(a) ensure protection of the state’s environmental resources, including but not limited to air, water, animals, plants, and soils; (b) ensure consideration of socioeconomic impacts; (c) provide citizens with the opportunity to participate in facility siting decisions; and (d) establish a coordinated and efficient method for the processing of all authorizations required for regulated facilities under this [law] chapter” (75-20-102, MCA).

Montana Environmental Policy Act. Chapter 1 of MCA Title 75 was established by the Montana legislature. The purpose of this Act is to “foster and promote the general welfare, to create and maintain conditions under which humans and nature can coexist in productive harmony, to recognize the right to use and enjoy private property free of undue government regulation, and to fulfill the social, economic, and other requirements of present and future generations of Montanans” (75-1-103, MCA).

Montana County Weed Control Act. This act (MCA Title 7, Chapter 22, Part 21) provides for weed management activities at the county level. Local county government has the responsibility for the implementation and enforcement of weed management on all public and private lands in Montana, including USFS- and BLM-administered lands (MNWSAC-WMTF 2008).

Idaho-Title 18-Crimes and Punishments. This statute directs the Idaho Department of Fish and Game to protect select native wildflowers and shrubs along the rights-of-way of any public highways in Idaho.

Idaho-Title 22-Agriculture and Horticulture, Chapter 24, Noxious Weeds. This statute defines noxious weeds for Idaho; specifies associated legal requirements, duties, and responsibilities; and provides the statutory and financial means for the control of noxious weeds in Idaho.

Idaho-Title 36-Fish and Game. This statute directs the Fish and Game Commission to preserve, protect, perpetuate, and manage all wildlife, including all wild animals, wild birds, and fish, in Idaho.

3.10.2 Vegetation Cover Types

3.10.2.1 Environmental Setting

Seven general vegetation cover types occur in the proposed project study area. The project area is defined as a 2-mile-wide corridor centered on each alternative or LRO and encompasses roughly 1.2 million acres of land. Each cover type is described in more detail in Appendix C.10.1. Sagebrush shrublands are the most prevalent community type in the project area, followed in descending order by grasslands, anthropogenic lands, forested areas, shrublands, riparian/wetland areas, and rock/sparse vegetation areas (Tables 3.10-1 and 3.10-2).

Table 3.10-1. Extent of Vegetation Cover Types in the Proposed Project Study Area

Vegetation Cover Type	Acres	Percent
Sagebrush	554,166	46
Grassland	292,224	24
Anthropogenic	151,160	13
Forest	87,284	7
Shrublands	55,137	5
Riparian/Wetland	31,077	3
Rock/Sparse Vegetation	28,593	2
Total	1,199,641*	100

* Roughly 66 acres are unaccounted for (not categorized). These uncategorized polygons are small slivers of land between polygons and are inherent to the vegetation cover type data used in the analysis.

Table 3.10-2. Summary of Vegetation Cover Types Occurring in the Proposed Project Study Area*

Zone	Alternative/LRO	Acres Percent	Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	Total
1	1A	Acres	5,165	27,903	9,538	15,403	42,028	5,542	704	106,284
		Percent	5%	26%	9%	14%	40%	5%	1%	100%
	1B	Acres	11,377	59,311	5,240	15,103	20,719	5,095	173	117,018
		Percent	10%	51%	4%	13%	18%	4%	0%	100%
	1C	Acres	19,870	60,396	14,938	13,371	9,708	4,580	326	123,188
		Percent	16%	49%	12%	11%	8%	4%	0%	100%
	1D	Acres	8,706	44,956	3,761	4,896	6,005	2,618	41	70,984
		Percent	12%	63%	5%	7%	8%	4%	0%	100%
2	2A	Acres	4,250	34,386	2,754	21,923	8,169	3,690	147	75,319
		Percent	6%	46%	4%	29%	11%	5%	0%	100%
	2B	Acres	7,504	35,013	2,549	17,682	7,625	4,346	147	74,866
		Percent	10%	47%	3%	24%	10%	6%	0%	100%
	2C	Acres	6,515	61,997	6,346	17,667	19,595	3,914	223	116,258
		Percent	6%	53%	5%	15%	17%	3%	0%	100%
	2D	Acres	5,049	38,953	2,726	15,780	14,965	3,776	1,298	82,549
		Percent	6%	47%	3%	19%	18%	5%	2%	100%
	2E	Acres	3,847	47,643	4,868	7,461	4,897	1,438	93	70,248
		Percent	5%	68%	7%	11%	7%	2%	0%	100%

Table 3.10-2. Summary of Vegetation Cover Types Occurring in the Proposed Project Study Area*

Zone	Alternative/LRO	Acres Percent	Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	Total
3	3A	Acres	7,178	24,755	2,182	54,515	1,581	4,769	259	95,238
		Percent	8%	26%	2%	57%	2%	5%	0%	100%
	3B	Acres	6,968	34,714	3,119	37,055	766	5,863	328	88,814
		Percent	8%	39%	4%	42%	1%	7%	0%	100%
	3C	Acres	5,387	23,108	3,362	55,501	1,135	5,967	328	94,789
		Percent	6%	24%	4%	59%	1%	6%	0%	100%
4	4A	Acres	628	0	6,106	17,023	1,595	2,237	12	27,600
		Percent	2%	0%	22%	62%	6%	8%	0%	100%
5	5A	Acres	7,105	0	7,004	121,679	1,875	531	1,088	139,281
		Percent	5%	0%	5%	87%	1%	0%	1%	100%
	5B	Acres	16,002	0	2,748	125,561	0	383	2,734	147,428
		Percent	11%	0%	2%	85%	0%	0%	2%	100%
	5C	Acres	62,960	0	1,863	66,691	0	749	17,604	149,867
		Percent	42%	0%	1%	44%	0%	1%	12%	100%
	5D	Acres	32,953	0	1,863	107,826	0	483	516	143,641
		Percent	23%	0%	1%	75%	0%	0%	0%	100%
6	6A	Acres	10,850	3,359	0	118,956	0	547	5,412	139,124
		Percent	8%	2%	0%	86%	0%	0.4%	4%	100%

Table 3.10-2. Summary of Vegetation Cover Types Occurring in the Proposed Project Study Area*

Zone	Alternative/LRO	Acres Percent	Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	Total
LROs	Beef Trail	Acres	222	1,129	102	3,091	555	352	0	5,450
		Percent	4%	21%	2%	57%	10%	6%	0%	100%
	Clark Canyon East	Acres	141	3,265	866	6,902	399	371	9	11,954
		Percent	1%	27%	7%	58%	3%	3%	0%	100%
	Diamond Butte	Acres	3	471	12	6,557	0	935	66	8,044
		Percent	0%	6%	0%	82%	0%	12%	1%	100%
	Fleecer	Acres	430	4,839		177	119	353	0	5,917
		Percent	7%	82%	0%	3%	2%	6%	0%	100%
	Frying Pan Gulch	Acres	8	5,410	14	2,717	0	4	0	8,154
		Percent	0%	66%	0%	33%	0%	0%	0%	100%
	Haseman	Acres	4,203	21,100	5,333	973	1,994	375	0	33,978
		Percent	12%	62%	16%	3%	6%	1%	0%	100%
	Lima	Acres	555	13,216	57	1,944	0	453	0	16,224
		Percent	3%	81%	0%	12%	0%	3%	0%	100%
	Lower Boulder	Acres	1,562	8,583	5,889	33	2,027	335	0	18,427
		Percent	8%	47%	32%	0%	11%	2%	0%	100%
	Maiden Rock	Acres	675	3,565	1,124	2,095	242	569	60	8,331
		Percent	8%	43%	13%	25%	3%	7%	1%	100%

Table 3.10-2. Summary of Vegetation Cover Types Occurring in the Proposed Project Study Area*

Zone	Alternative/LRO	Acres Percent	Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	Total
LROs	Mount Haggin	Acres	496	1,324	512	589	910	321	0	4,153
		Percent	12%	32%	12%	14%	22%	8%	0%	100%
	North of Buxton	Acres	338	4,936	155	2,718	2,047	349	2	10,544
		Percent	3%	47%	1%	26%	19%	3%	0%	100%
	Potential Cross- Over	Acres	2	1,830	15	7,832	0	87	0	9,766
		Percent	0%	19%	0%	80%	0%	1%	0%	100%
	Raders- burg	Acres	213	4,305	323	2,843	394	20	0	8,097
		Percent	3%	53%	4%	35%	5%	0%	0%	100%
	Rock Creek	Acres	162	4,299	399	983	1,049	241	0	7,133
		Percent	2%	60%	6%	14%	15%	3%	0%	100%
	South of Butte	Acres	945	1,463	137	1,115	1,967	437	11	6,074
		Percent	16%	24%	2%	18%	32%	7%	0%	100%
	Upp er Boul der 1	Acres	4,387	15,664	170	949	420	55	0	21,644
		Percent	20%	72%	1%	4%	2%	0%	0%	100%
	Upper Boulder 2	Acres	4,593	14,225	165	360	393	66	0	19,802
		Percent	23%	72%	1%	2%	2%	0%	0%	100%
	Willow Creek	Acres	698	2,126	74	572	45	187	0	3,702
		Percent	19%	57%	2%	15%	1%	5%	0%	100%

* Project area is defined as the land area within 1 mile on either side (2 mile total width) of alternatives and LRO transmission centerlines.

The anthropogenic cover type is represented by areas that have been altered by human activity such as irrigated and non-irrigated agricultural croplands and urban areas. The anthropogenic cover type comprises approximately 13 percent of the project area (Table 3.10-1) and comprises more than 10 percent of the following alternatives: 5C (42 percent), 5D (23 percent), 6A (19 percent), 1C (16 percent), 1D (12 percent), and 1B and 2B (10 percent) (Table 3.10-2).

Grasslands are dominated by grasses and forb species, but may have occasional or scattered shrubs or trees. This cover type is crossed by all of the proposed alternatives. Cumulatively, grasslands comprise more than 24 percent of the project area, which is the second most of any of the vegetation cover types in the project area. Alternatives in which grasslands comprise more than 50 percent of the land area are 2E (68 percent), 1D (63 percent), 2C (53 percent), and 1B (51 percent) (Table 3.10-2). All of the alternatives in Idaho (Alternatives 4A through 6A) have less than 3 percent of their land area as grasslands (Table 3.10-2).

The shrubland community type is represented by shrubs other than sagebrush (Appendix C.10.1). With only 5 percent of the project area containing shrublands, their distribution is relatively limited. However, in Alternatives 4A (22 percent) and 1C (12 percent), they are relatively more common (Table 3.10-2). Alternative 6A is the only alternative where no shrublands have been mapped.

Sagebrush communities make up the majority (45 percent) of the project area and comprise more than half of the vegetation cover types in the following alternatives: 5A (87 percent), 5B (85 percent), 6A (77 percent), 5D (75 percent), 4A (62 percent), 3C (59 percent), and 3A (57 percent). Sagebrush communities are the least prevalent in several of the northern alternatives, such as 1D (7 percent), 1C and 2E (11 percent), 1B (13 percent), and 1A (14 percent) (Table 3.10-2).

Forests comprise roughly 7 percent of the project area. Approximately 50 percent of the forest cover type occurs in Alternative 1A. Alternatives with 10 or more percent of their land area covered with forests are 1B (18 percent), 2D (18 percent), 2C (17 percent), 2A (11 percent), and 2B (10 percent) (Table 3.10-2). Forest communities make up less than 5 percent of Alternatives 3A through C, 5A through D, and 6A.

Riparian/wetland areas are transitional areas between drier upland habitats and aquatic habitats. In the project area, this cover type comprises approximately 3 percent of the land area. Project alternatives where riparian/wetland areas comprise 5 or more percent of the project area are 4A (8 percent), 3B (7 percent), 2B and 3C (6 percent), and 1A, 2A, 2D, and 3A (5 percent) (Table 3.10-2). Riparian/wetland areas comprise less than 1 percent of the plant communities found in the Idaho alternatives (5A-D and 6A). A detailed discussion of riparian/wetland areas is in Section 3.12.

The rock/sparse vegetation cover type includes areas of rock (e.g., exposed rock, rock outcrops, and talus or scree slopes with less than 5 percent vegetative cover), vegetated lava, and mixed barren land. Rock/sparse vegetation communities comprise roughly 2 percent of the project area. This community type is most prevalent in Alternatives 5C and 6A, where it makes up roughly 12 and 4 percent, respectively, of the land area in those alternatives. The vegetated lava fields in this alternative alone account for 72 percent of all the rock/sparse vegetative communities found in the project area; however, very few areas of the rock/sparse vegetation cover type occur in the majority of the proposed transmission line routes.

Noxious Weeds

The term “noxious weed” has specific legal connotations and typically refers to specific plant species identified by state or federal governments as noxious. In Montana, noxious weeds are defined as any exotic plant that is established or that may be introduced, that may render the land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses, or that may harm native plant communities (Section

7-22-2101 to 2153, MCA). The State of Idaho defines noxious weeds as any plant that has the potential to cause injury to public health, crops, livestock, land, or other property and which is designated as noxious by the Director of Agriculture (Idaho Code Sections 22-2401 through 2413). On state-administered public lands and private lands in both states, noxious weeds are managed at the county level. Noxious weeds on public lands administered by the BLM or USFS are managed by those agencies.

Because of their negative impacts on the productivity and ecological health of native plant communities, noxious weeds are statewide concerns in Montana and Idaho. In most ecosystems, invading non-native species disrupt the succession of native species because they have specific traits or combinations of traits that provide growth and reproductive advantages over native species. In addition, noxious weeds can survive under more harsh conditions than most native plants, quickly invade disturbed sites, and are typically difficult to eradicate.

Infestations of noxious weeds are initially established from non-native plant seeds carried by vehicles, hay, humans, heavy equipment, birds, livestock, wildlife, or contaminated commercial seed. Noxious weeds typically invade and colonize disturbed areas such as roadsides, riparian areas, construction zones, or heavily grazed rangeland. Though land disturbance facilitates the spread and establishment of noxious weeds, they can also become established in undisturbed or minimally disturbed areas.

Montana has designated 32 plant species as noxious (MNWSAC-WMTF 2008); Idaho has designated 57 weed species as noxious (IDA 2008). In addition, numerous Montana counties have identified an additional 42 species as noxious (MDA 2009). Of the state-designated weed species in Montana and Idaho, 25 species are common to both states. When these lists are combined, a total of 57 noxious weed species potentially occur in the proposed project study area (Appendix C.10.2). A substantial number of noxious weed species, ranging from 16 in Alternative 4A to 37 in Alternative 6A, already occur in the counties crossed by project alternatives. Several ubiquitous weed species occur in all of the counties that project alternatives cross (Table 3.10-3). The Plan of Development (POD) (Appendix B.4) also lists noxious weed species occurrence by county. Occurrence information for weeds differs somewhat between Appendix B.4 and Appendix C.10.2 because of the use of different sources of information in the development of these lists.

Though technically not classified as a noxious weed, cheatgrass is also common throughout the project area. This annual brome is non-native and highly invasive and has degraded tens of millions of acres of habitat throughout the western U.S. (Pellant 1996). A primary consequence of cheatgrass on vegetation communities is an increase in fire frequencies, which can drastically alter the vegetation compositions of these communities.

3.10.2.2 Analysis Methods

Transmission Line Impacts

Direct, permanent, and short- and long-term impacts to plant communities from construction and operation and maintenance of the transmission line (excluding access roads) were calculated using a geographic information systems (GIS) overlay process and the general disturbance model developed by NorthWestern (Table 3.10-4). Because site-specific information on tower types, tower locations, tensioning sites, staging areas, and other project elements are not currently available, the disturbance model was used in lieu of site-specific information. Different tower types with their different construction requirements would cause varying levels of impact. The highest level of impact, regardless of tower-specific construction requirements, has been assumed for purposes of this EIS. This is considered to be a conservative approach to impacts and may somewhat overstate impacts in certain locations where a tower requiring less impact than that assumed here is ultimately used.

Table 3.10-3. Documented Noxious Weeds Potentially Occurring within all Proposed Project Alternatives*

Common Name	Scientific Name
Black henbane	<i>Hyoscyamus niger</i>
Canada thistle	<i>Cirsium arvense</i>
Dalmatian toadflax	<i>Linaria genistifolia</i> ssp. <i>dalmatica</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Dyer's woad	<i>Isatis tinctoria</i>
Field bindweed	<i>Convolvulus arvensis</i>
Houndstongue	<i>Cynoglossum officinale</i>
Leafy spurge	<i>Euphorbia esula</i>
Musk thistle	<i>Carduus nutans</i>
Russian knapweed	<i>Acroptilon repens</i> (Syn. <i>Centaurea repens</i>)
Spotted knapweed	<i>Centaurea stoebe</i> (Syn. <i>Centaurea maculosa</i>)
Whitetop	<i>Cardaria draba</i>
Yellow toadflax	<i>Linaria vulgaris</i>

Sources: MNWSAC-WMTF 2008; MDA 2009; IDA 2008

* Based on county occurrence information.

Table 3.10-4. Disturbance Model for Transmission Line Alternatives

Type of Impact	Direct Impacts	
	Short-/Long-Term Impact	Permanent Impact
Structures (4 to 6 per mile)	6.6 acres/mile	2.1 acres/mile
Rights-of-way in forests only ¹ (150 to 220 feet wide)	0	26.7 acres/mile ²
Mid-span conductor splicing sites (hydraulic method)	2 acres every 3.4 miles	0
Pulling/tension sites for tangent structures	3 acres every 3 miles	0
Pulling/tension sites for strain structures	6 acres every 3 miles	0
Material staging sites	15 acres every 30 miles	0
Concrete batch plants	5 acres every 35 miles	0

Source: NorthWestern revised disturbance model May 27, 2009.

1 The main issue is tree height. Trees that could potentially interfere with the operation and maintenance of the transmission line would be permanently removed for the life of the project. Note that tree density is not considered here. In naturally open forests or in forests thinned through logging, the impacts may be overestimated. Impacts may be underestimated in areas where trees must be cleared upslope of the line. Because of their shorter stature, shrub species would not interfere with the transmission line and, where possible, would be allowed to persist in the project area.

2 In forested areas, the only impact calculation used was the 26.7 acres/mile estimate.

The impacts analyses for vegetative cover types and rangeland health on grazing allotments involved calculating the number of miles traversed by the transmission line alternatives per vegetative cover type or allotment. Once the mileage was obtained, the rates of disturbance from the disturbance model (Table 3.10-4) were applied to these distances to generate estimates of the number of acres of impact per mile of transmission line by vegetation type. Because of their height, trees may interfere with the operation and maintenance of the transmission line and would be permanently removed. Tree density is not considered in the disturbance model, meaning that in naturally open forests or in forests thinned through logging, the impacts may be overestimated. Correspondingly, impacts may be underestimated in areas where trees must be cleared upslope of the line outside the right-of-way. According to NorthWestern, material staging areas and concrete batch plants would typically be located near the transmission line on agricultural lands leased from a willing private landowner. Because specific locations for these areas are unknown, and because impacts would be short term and typically occur on land disturbed from agricultural activities, short-term impacts from these two project elements are reported but are not assigned to a specific vegetative cover type. Batch plant and staging area construction disturbances are directly proportional to the alternative length and range from about 13 to 75 acres per alternative.

New Access Road and Overland Route Impacts

Direct impacts caused by new access road construction and overland routes were assessed using a GIS overlay process. New access roads are defined as roads that would require vegetation clearing, excavating, and grading. These would be considered permanent impacts. Overland routes are defined as routes required during the construction of the transmission line that would not require vegetation clearing, excavating, or grading, and are considered to be short- or long-term impacts. A GIS road layer, as provided by NorthWestern, was overlaid on the vegetation cover type (and grazing allotment) layers in the GIS. The total length of new access roads/overland routes was calculated by alternative for each vegetation cover type and grazing allotment. By assuming a constant road width of 24 feet, acreage estimates were calculated. The new access roads layer was developed using best professional judgment by staff at NorthWestern. The proposed project is not at a level of design where exact road locations are available. Together, new roads and overland routes are termed “indicative roads” because the new access roads and overland routes are considered indicative of the relative level of impact in each alternative. Specific locations of impact would not be available until a preferred alternative is chosen and final surveys and designs are complete.

3.10.2.3 Impact Analysis

Generally, impacts can be direct or indirect, and can be short-term, long-term, or permanent (i.e., residual). Direct impacts are the result of the physical destruction or degradation of a resource within a proposed project alternative. An example of a direct impact is the excavating and grading of grassland habitat during the construction of a road. Indirect impacts are foreseeable effects that are somewhat distant from the project in time and/or space (see 40 CFR 1508.8). A relatively common example of an indirect impact is the introduction and establishment of noxious weeds in newly disturbed soils. The noxious weeds become established and out-compete native plant species, which then leads to reduced forage availability for livestock and wildlife and can result in the avoidance or reduced use by wildlife. Noxious weeds can also adversely affect the viability of localized populations of special status plant species.

Short-term impacts are temporary and usually restored to pre-impact functionality within 5 years. When not permanent, impacts to grasslands are frequently considered short-term because these communities typically recover more quickly than plant communities possessing a woody plant component. Long-term impacts take longer than 5 years to revert to pre-impact functionality, but do eventually recover from the impact. Because of their woody component, long-term impacts can be expected in forested areas,

shrublands, and sagebrush-dominated areas. They can also be expected in more extreme environments, such as alpine areas or arid landscapes that pose substantial constraints to plant establishment, growth, and persistence. Permanent impacts are those where a complete change in functionality occurs (i.e., land conversion) or restoration to pre-impact conditions takes an exceptionally long time to occur (e.g., more than 50 years). Permanent impacts are considered residual impacts; that is, impacts that remain once mitigation has occurred.

No Action Alternative

Under the no action alternative, the proposed project would not be built, and there would be no indirect or direct impacts to vegetation caused by construction of the proposed transmission line and associated roads and overland routes. Noxious weeds would continue to spread in and around the proposed project area, but the rate of their spread would not be facilitated by disturbances associated with a large-scale transmission line project. Ongoing maintenance-related impacts, such as noxious weed introduction and spread, would also not occur under the no action alternative.

Action Alternatives

Indirect Impacts. The types of indirect impacts that can be expected are similar among alternatives and primarily include the establishment and/or spread of noxious weeds and changes in hydrologic regimes.

Seeds and plant parts of noxious weeds and other invasive plant species (e.g., cheatgrass) can be carried into a project area on automobiles and construction equipment; pre-existing weed seeds at a site can be spread during construction; or the wind and wildlife can deliver weed seeds to newly disturbed soils. These different ways for weed seed to be spread facilitate both the establishment and spread of weeds in an area. Once established, they can spread into nearby undisturbed areas. Without intervention they can degrade habitat quality for various wildlife species and result in a shift in plant and animal species composition found in a particular area. This type of indirect impact degrades rangeland health as well as the suitability of habitat for wildlife and birds. All of the temporarily disturbed areas, as well as areas of right-of-way clearing in forested habitats, would be especially susceptible to noxious weed invasion.

Changes in hydrology can occur when changes are made to overland flow routing. These changes can result in either wetter or drier conditions for a particular area. New access roads constructed for the proposed project could cause a shift in localized drainage patterns, thereby altering how water moves across the landscape and resulting in shifts in species composition and overall productivity. This type of impact would be most pronounced in riparian/wetland areas, especially if one or more of these riparian/wetland areas were made drier.

Fire is also a potential indirect impact caused by sparks during construction, operation, or the public. Fire is also a liability to the proposed project. The consequences of fire on vegetation in the project area, whether ignition occurs within or outside of the project area, are dependent on three main factors: fuel conditions, weather, and topography.

Ongoing operations of the transmission line would likely have minimal additional impacts to vegetation resources above and beyond those caused by initial construction. Though travel on access roads may increase the risk of ongoing or subsequent noxious weed/cheatgrass invasions, there are not expected to be substantial soil disturbances required for routine maintenance, and the project area would undergo regular weed management actions by NorthWestern staff and/or its contractors.

Direct Impacts

Direct permanent and short- or long-term adverse impacts resulting from crushing or uprooting of plants or the creation of dust along roads and at construction sites would occur to plant communities through the construction of transmission line towers, stringing and tensioning conductors, construction of new roads,

and improvement of existing roads. The magnitude of short- or long-term and permanent impacts is directly related to the length of the alternative, with longer alternatives resulting in more acres of impacted vegetation types. In addition, areas with more forest cover can be expected to have relatively more areas impacted than areas with no forests. This is because trees can interfere with transmission lines and must be permanently removed, whereas shrubs and herbaceous vegetation can be allowed to re-grow in temporarily disturbed areas. Overall, projected impacts for each alternative caused by the proposed transmission line and new access roads or overland routes range from about 290 acres for Alternative 4A (the shortest alternative) to more than 2,000 acres for Alternative 1A, one of the longer routes (Table 3.10-5). Projected impacts to public lands administered by the BLM, USFS, Idaho National Laboratory, and the states of Idaho and Montana are shown in Appendix C.10.3.

The sections below summarize the salient components of the impact estimates to vegetation cover types for each alternative in the six project zones. Though listed in the tables (Tables 3.10-6 and 3.10-7), impacts to anthropogenic areas (i.e., agricultural, urban, etc.) are not discussed. For a complete discussion of impacts to anthropogenic areas, see Section 3.6. Similarly, impacts caused by concrete batch plants and staging areas are expected to occur on agricultural lands leased for this purpose. These types of impacts are temporary and range from approximately 13 to 76 acres for the different alternatives. Appendix C.10.4 provides a more complete discussion of these impacts.

Zone 1. Alternative lengths in Zone 1 range from 54 miles to 95 miles. Alternative 1D is the shortest and Alternative 1C the longest (Table 3.10-5). In terms of the total permanent direct impact (i.e., residual impacts) to vegetation cover types, the alternatives in Zone 1 are ranked in the following order (most impact to least impact): 1A, 1B, 1C, and 1D. When short-/long-term direct impacts are considered, they are ranked in the following order (most impact to least impact): 1C, 1B, 1A, and 1D (Table 3.10-5).

The majority of adverse impacts in this zone would be to forested habitats (Alternatives 1A and 1B) and to grasslands (Alternatives 1B, 1C, and 1D). The predominant forested cover type in this zone is mixed conifer, though some juniper forests also occur at lower elevations. Alternative 1A would have the greatest permanent and total impact (Table 3.10-5) of the four alternatives in this zone. In fact, Alternative 1A is projected to have the second greatest impact to vegetative resources of all the alternatives considered. This is because of the greater amount of forest cover occurring along this route, consequently requiring a higher level of right-of-way clearing. Conversely, Alternative 1D would have the least amount of impact to vegetative cover types in this zone because it is the shortest alternative and therefore crosses less vegetated land. Though impacts to riparian/wetland areas would generally be avoided, there is a greater likelihood that transmission line and new access road impacts to this habitat type would also be greater in Alternative 1A than in the other three Zone 1 alternatives (Tables 3.10-6 and 3.10-7). Direct impacts to the rock/sparse vegetation cover type are expected to be relatively low for all four alternatives in this zone; however, comparatively, Alternative 1C would potentially impact a substantially greater amount of this cover type than Alternatives 1A, 1B, or 1D.

Total adverse impacts associated with new access roads would be similar among Alternatives 1A, 1B, and 1C (Tables 3.10-5 and 3.10-7). Alternative 1D is projected to have the least total direct impact from new road construction or overland routes (Table 3.10-5). Alternative 1A access roads would primarily affect forested, sagebrush, and grassland habitats, whereas new access roads in Alternatives 1B, 1C, and 1D would primarily affect grasslands. Use of overland routes is maximized in grasslands across all four Zone 1 alternatives.

Table 3.10-5. Summary of Direct Impacts to Vegetation Caused by the Transmission Line and Associated New Roads/Overland Routes*

Alternative	Length (Miles)	Transmission Line* (Acres)			Roads (Acres)			Totals (Acres)		
		Short-/Long-Term	Permanent	Subtotal	Short-/Long-Term	Permanent	Subtotal	Short-/Long-Term	Permanent	Total
Zone 1										
1A	81.8	502	971	1,473	36	168	204	538	1,139	1,678
1B	90.2	766	560	1,326	75	139	213	840	699	1,539
1C	94.9	919	314	1,233	89	112	201	1,008	426	1,434
1D	54	496	245	741	37	108	145	533	353	886
Zone 2										
2A	57.5	531	254	785	33	39	72	564	293	857
2B	57.2	527	253	780	46	78	124	573	331	904
2C	89.7	782	508	1,290	46	215	261	828	723	1,551
2D	63.5	532	409	942	25	167	192	558	576	1,134
2E	53.5	512	193	705	8	184	192	520	377	897
Zone 3										
3A	72.2	729	166	895	30	112	142	759	278	1,037
3B	67.2	677	157	834	30	210	240	707	367	1,074
3C	72	726	168	894	21	235	256	747	403	1,150
Zone 4										
4A	20	203	45	247	14	27	41	217	71	289
Zone 5										
5A	107.4	1,090	235	1,325	52	23	76	1,142	259	1,401
5B	114	1,161	239	1,400	46	54	100	1,207	294	1,501
5C	117.5	1,197	247	1,443	83	52	136	1,280	299	1,579
5D	111.3	1,134	234	1,367	77	50	127	1,211	283	1,494
Zone 6										
6A	107.4	1,094	226	1,320	83	259	342	1,177	485	1,662

* Impact estimates are rounded. Decimal points are shown for miles of new road and overland routes, and for some impacts to show a value greater than zero. Because of rounding, values in the total column may not appear to be the correct sum of a particular row when they are in fact accurate. Proposed transmission line impact estimates do not include projected impacts to agricultural fields caused by concrete batch plants or staging areas; see Appendix C.10.1 for this information.

Table 3.10-6. Summary of Projected Direct Permanent and Short- and Long-Term Impacts to Vegetation Cover Types Caused by the Proposed Transmission Line Alternatives*

Alternative	Impact Type	Estimated Impacts per Vegetation Community Type							Total
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	
Zone 1									
1A	Miles crossed	1.8	22.6	8.3	13.4	31.4	4.3	0	81.8
	Permanent (acres)	4	47	17	28	838	36	0	971
	Short-/long-term (acres)	18	230	85	137	0	33	0	502
	Total (acres)	22	277	102	165	838	68	0	1,473
1B	Miles crossed	4.2	53.6	3.7	11.5	14.3	2.8	0.1	90
	Permanent (acres)	9	113	8	24	383	24	0.2	560
	Short-/long-term (acres)	43	546	37	117	0	21	1	766
	Total (acres)	52	659	45	141	383	45	1	1,326
1C	Miles crossed	7.1	65.1	8.8	6.8	4.6	2.1	0.4	95
	Permanent (acres)	14.8	136.7	18.5	14.2	122.6	6	0.926	314
	Short-/long-term (acres)	72	663	90	69	0	21	4	919
	Total (acres)	87	800	108	83	123	27	5	1,233
1D	Miles crossed	3.3	39.1	2.6	2.9	4.9	1.2	0	54
	Permanent (acres)	7	82	5	6	130	14	0	245
	Short-/long-term (acres)	33	399	26	30	0	8	0	496
	Total (acres)	40	481	31	36	130	22	0	741
Zone 2									
2A	Miles crossed	2.3	29.9	1.4	16.5	4.7	2.6	0	58
	Permanent (acres)	5	63	3	35	127	22	0	254
	Short-/long-term (acres)	24	305	14	168	0	20	0	531
	Total (acres)	29	368	17	202	127	42	0	785

Table 3.10-6. Summary of Projected Direct Permanent and Short- and Long-Term Impacts to Vegetation Cover Types Caused by the Proposed Transmission Line Alternatives*

Alternative	Impact Type	Estimated Impacts per Vegetation Community Type							Total
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	
2B	Miles crossed	3	31.9	1.2	13.6	4.6	2.9	0	57
	Permanent (acres)	6	67	3	29	122	27	0	253
	Short-/long-term (acres)	30	325	13	139	0	21	0	527
	Total (acres)	36	392	15	167	122	48	0	780
2C	Miles crossed	1.4	55.8	5.2	12.3	12.5	2.5	0.1	90
	Permanent (acres)	3	117	11	26	334	17	0	508
	Short-/long-term (acres)	14	568	53	125	0	20	1	782
	Total (acres)	17	686	64	151	334	38	1	1,290
2D	Miles crossed	1	31.8	2.2	12.7	10.3	3.3	2.2	63
	Permanent (acres)	2	67	5	27	274	30	5	409
	Short-/long-term (acres)	10	324	22	130	0	24	23	532
	Total (acres)	12	390	27	157	274	54	27	942
2E	Miles crossed	0.4	41.3	4.1	3.7	3	1	0	54
	Permanent (acres)	1	87	9	8	81	8	0	193
	Short-/long-term (acres)	4	421	42	38	0	7	0	512
	Total (acres)	5	508	51	45	81	15	0	705
Zone 3									
3A	Miles crossed	2.3	22.2	0.6	43.1	0.4	3.4	0.3	72
	Permanent (acres)	5	47	1	91	9	13	1	166
	Short-/long-term (acres)	23	226	6	440	0	32	3	729
	Total (acres)	28	273	8	530	9	45	3	895
3B	Miles crossed	1.8	29.7	2.3	30.4	0.4	2.4	0.3	67
	Permanent (acres)	4	62	5	64	11	10	1	157
	Short-/long-term (acres)	18	302	23	310	0	21	3	677
	Total (acres)	22	365	28	374	11	32	3	834

Table 3.10-6. Summary of Projected Direct Permanent and Short- and Long-Term Impacts to Vegetation Cover Types Caused by the Proposed Transmission Line Alternatives*

Alternative	Impact Type	Estimated Impacts per Vegetation Community Type							Total
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	
3C	Miles crossed	1.1	20	2.2	45.8	0.4	2.3	0.3	72
	Permanent (acres)	2	42	5	96	10	12	1	168
	Short-/long-term (acres)	11	204	23	466	0	19	3	726
	Total (acres)	13	246	27	563	10	32	3	894
Zone 4									
4A	Miles crossed	0.1	0	3.5	14.6	0.1	1.7	0	20
	Permanent (acres)	0.2	0	7	31	3	4	0	45
	Short-/long-term (acres)	1	0	36	148	0	18	0	203
	Total (acres)	1	0	44	179	3	21	0	247
Zone 5									
5A	Miles crossed	1.1	0	6.2	99.4	0.4	0.1	0.3	107.4
	Permanent (acres)	2	0	13	209	10	1	1	235
	Short-/long-term (acres)	11	0	63	1,013	0	1	3	1,090
	Total (acres)	13	0	76	1,222	10	2	4	1,325
5B	Miles crossed	7	0	1.7	104.4	0	0.2	0.7	114
	Permanent (acres)	15	0	4	219	0	0	1	239
	Short-/long-term (acres)	72	0	17	1,063	0	2	7	1161
	Total (acres)	86	0	21	1,283	0	2	9	1,400
5C	Miles crossed	37.9	0	1	60.4	0	0.2	17.9	117.5
	Permanent (acres)	80	0	2	127	0	0.4	38	247
	Short-/long-term (acres)	386	0	10	616	0	2	183	1,197
	Total (acres)	466	0	12	742	0	2	220	1,443
5D	Miles crossed	16.6	0	1	93.6	0	0.2	0	111.3
	Permanent (acres)	35	0	2	196	0	0.3	0	234
	Short-/long-term (acres)	169	0	10	953	0	2	0	1,134
	Total (acres)	203	0	12	1150	0	2	0	1,367

Table 3.10-6. Summary of Projected Direct Permanent and Short- and Long-Term Impacts to Vegetation Cover Types Caused by the Proposed Transmission Line Alternatives*

Alternative	Impact Type	Estimated Impacts per Vegetation Community Type							Total
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	
Zone 6									
6A	Miles crossed	5.3	2.6	0	97.4	0	0.3	1.7	107.4
	Permanent (acres)	11	6	0	205	0	1	4	225.6
	Short-/long-term (acres)	54	27	0	993	0	3	18	1,094.3
	Total (acres)	65	32	0	1,197	0	3	21	1,319.9

* Impact estimates are rounded. Decimal points are shown for miles of new road and overland routes and for some impacts to show a value greater than zero. Because of rounding, values in the total column may not appear to be the correct sum of a particular row when they are in fact accurate estimates. Proposed transmission line impact estimates do not include projected impacts to agricultural fields caused by concrete batch plants or staging areas; see Appendix C.10.1 for this information.

Table 3.10-7. Summary of Projected Direct Permanent Impacts to Vegetation Cover Types Caused by Proposed New Access Roads and Overland Routes in the Proposed Project Area

Alternative	Impact Type	Estimated Permanent and Short-/Long-Term Impacts per Vegetation Community Type							Total
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	
Zone 1									
1A	New road (miles)	0.7	16.6	4.8	11.1	23.7	1.1	0	57.9
	Permanent impact (acres)	2	48	14	32	69	3	0	168
	Overland routes (miles)	1	7	0.8	2.4	0.1	1.1	0	12.4
	Short-/long-term (acres)	3	21	2	7	0.2	3	0	36
1B	New road (miles)	1.4	30.1	1.4	6	8.1	0.7	0	47.7
	Permanent (acres)	4	87	4	18	23	2	0	139
	Overland routes (miles)	3	16.2	1.6	2.8	0.9	1	0.1	25.6
	Short-/long-term (acres)	9	47	5	8	3	3	0.3	75
1C	New road (miles)	1.9	26.3	8.1	0.8	1	0.4	0	38.5
	Permanent (acres)	6	76	24	2	3	1	0	112
	Overland routes (miles)	3.3	20.8	1.2	3.5	0.9	0.7	0.3	30.6
	Short-/long-term (acres)	10	60	3	10	3	2	1	89

Table 3.10-7. Summary of Projected Direct Permanent Impacts to Vegetation Cover Types Caused by Proposed New Access Roads and Overland Routes in the Proposed Project Area

Alternative	Impact Type	Estimated Permanent and Short-/Long-Term Impacts per Vegetation Community Type							
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Spars Vegetation	Total
1D	New road (miles)	1	27	1	2	5	0.3	0	37.2
	Permanent (acres)	4	78	3	7	15	1	0	108
	Overland routes (miles)	3	8	1	0.2	.03	1	0	12.6
	Short-/long-term (acres)	8	25	2	0.5	0.1	1	0	37
Zone 2									
2A	New road (miles)	0.3	8.3	0.2	3.4	1	0.1	0	13.3
	Permanent (acres)	1	24	1	10	3	0.4	0	39
	Overland routes (miles)	1.3	6.3	0.7	2.3	.03	0.7	0	11.4
	Short-/long-term (acres)	4	18	2	7	0.1	2	0	33
2B	New road (miles)	0.6	15.7	0	9.3	1.02	0.2	0	26.9
	Permanent (acres)	2	46	.02	27	3	0.4	0	78
	Overland routes (miles)	1.4	9.6	0.9	3.1	.03	0.8	0	15.8
	Short-/long-term (acres)	4	28	3	9	0.1	2	0	46
2C	New road (miles)	0.3	51.2	5.2	8	8.1	1.1	0.1	73.9
	Permanent (acres)	1	149	15	23	23	3	0.2	215
	Overland routes (miles)	0.3	10.5	0.9	2.6	0.9	0.5	0.1	15.7
	Short-/long-term (acres)	1	30	2	8	3	1	0.3	46
2D	New road (miles)	0.2	28.2	2.6	12.5	12.6	1.2	0.1	57.5
	Permanent (acres)	1	82	7.5	36	37	3.5	0	167
	Overland routes (miles)	0.7	4.1	0.3	0.3	0.1	1.2	2.1	8.7
	Short-/long-term (acres)	2	12	0.8	1	0.2	3	6	25
2E	New road (miles)	0.2	47.9	4.9	4.4	5.3	0.6	0.1	63.4
	Permanent (acres)	1	139	14	13	15	2	0.2	184
	Overland routes (miles)	0	2.7	0	0	0	0	0	2.7
	Short-/long-term (acres)	0	8	0	0	0	0	0	8
Zone 3									
3A	New road (miles)	0.5	17	0.1	19.3	0.34	1	0.4	38.6
	Permanent (acres)	1	50	0.4	56	1	3	1	112
	Overland routes (miles)	1.6	3.1	0.1	4.2	0	1.2	0	10.2
	Short-/long-term (acres)	5	9	0.2	12	0	4	0	30

Table 3.10-7. Summary of Projected Direct Permanent Impacts to Vegetation Cover Types Caused by Proposed New Access Roads and Overland Routes in the Proposed Project Area

Alternative	Impact Type	Estimated Permanent and Short-/Long-Term Impacts per Vegetation Community Type							
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparse Vegetation	Total
3B	New road (miles)	0.5	31.6	1.9	35.6	1.2	1.1	0.4	72.3
	Permanent (acres)	1	92	6	104	3	3	1	210
	Overland routes (miles)	1.1	4.9	0.2	3.7	.03	0.40	0	10.3
	Short-/long-term (acres)	3	14	1	11	0.1	1.17	0	30
3C	New road (miles)	0.5	23.7	2.8	51	1.2	1.2	0.4	80.8
	Permanent (acres)	1	69	8	148	3	4	1	235
	Overland routes (miles)	0.5	1.3	0.2	5	0	0.3	0	7.3
	Short-/long-term (acres)	1	4	0.6	15	0	0.9	0	21
Zone 4									
4A	New road (miles)	0	0	1.4	7.8	.03	0.1	0	9.2
	Permanent (acres)	0	0	4	23	0.1	0.2	0	27
	Overland routes (miles)	0	0	0.1	3.9	0	0.9	0	4.9
	Short-/long-term (acres)	0	0	0.4	11	0	2.5	0	14
Zone 5									
5A	New road (miles)	0	0	0	8.1	0	0	0	8.1
	Permanent (acres)	0	0	0	23	0	0	0	23
	Overland routes (miles)	0.4	0	1	16.4	0.1	.02	.01	17.9
	Short-/long-term (acres)	1	0	3	48	0.2	.05	.04	52
5B	New road (miles)	0.6	0	0	17.7	0	0	0.4	18.7
	Permanent (acres)	2	0	0	51	0	0	1	54
	Overland routes (miles)	0.1	0	0.1	15.5	0	0.1	0	15.9
	Short-/long-term (acres)	0.2	0	0.4	45	0	0.4	0	46
5C	New road (miles)	1.7	0	0	1.2	0	0	15.1	18
	Permanent (acres)	5	0	0	3	0	0	44	52
	Overland routes (miles)	8.6	0	0	19.9	0	0.1	0	28.7
	Short-/long-term (acres)	25	0	0	58	0	0	0	83
5D	New road (miles)	1	0	0	13.1	0	0	3	17.1
	Permanent (acres)	3	0	0	38	0	0	9	50
	Overland routes (miles)	0.3	0	0	26.1	0	0.1	0	26.6
	Short-/long-term (acres)	1	0	0	76	0	0	0	77

Table 3.10-7. Summary of Projected Direct Permanent Impacts to Vegetation Cover Types Caused by Proposed New Access Roads and Overland Routes in the Proposed Project Area

Alternative	Impact Type	Estimated Permanent and Short-/Long-Term Impacts per Vegetation Community Type							
		Anthropogenic	Grasslands	Shrublands	Sagebrush	Forested	Riparian/Wetland	Rock/Sparsely Vegetation	Total
Zone 6									
6A	New road (miles)	3.42	7.1	0	67.5	0	9.8	1	88.9
	Permanent (acres)	9.95	21	0	196	0	29	3	259
	Overland routes (miles)	1.1	0	0	25.7	0	1.54	0	28.4
	Short-/long-term (acres)	3	0	0	75	0	4.5	0	83

* Impact estimates are rounded. Decimal points are shown for miles of new road and overland routes and for some impacts to show a value greater than zero. Because of rounding, values in the total column may not appear to be the correct sum of a particular row when they are in fact accurate estimates.

Zone 2. Alternative 2C is the longest route in Zone 2 (approximately 90 miles), while Alternatives 2A, 2B, 2D, and 2E are all similar in length (53 to 58 miles) (Table 3.10-5). Alternatives 2A and 2B follow the same route or generally parallel one another and consequently would have similar levels of adverse direct impacts to different vegetation types and overall impacts to vegetation. Alternative 2C is considerably longer than the other four alternatives in this zone, follows a different route across the landscape, and therefore impacts different vegetation cover types and could be expected to impact nearly twice as much land area as the other alternatives. The primary type of impact in all five of these alternatives is temporary impact to grasslands caused by the construction of the transmission line. The route in Zone 2 that is least impactful to riparian/wetland areas is Alternative 2E, followed by Alternatives 2C, 2A, 2B, and 2D. The potential impact to rock/sparsely vegetated areas is considerably greater in Alternative 2D compared to the other Zone 2 alternatives.

Alternatives 2A and 2B would be expected to primarily impact grasslands, whereas Alternatives 2C and 2D would also have a substantial component of permanent impact to forested areas (Tables 3.10-6 and 3.10-7). Alternative 2E would impact the least amount of forested area. Projected potential transmission line and new access road impacts to shrublands are two to three times greater in Alternatives 2C and 2E when compared to the other three alternatives.

Zone 3. Alternatives 3A, 3B, and 3C are all roughly the same length (67 to 72 miles) (Table 3.10-5), generally parallel one another, and would have similar affects on vegetative resources in the project area. Alternative 3C is projected to have the greatest adverse impact on vegetation, followed by Alternatives 3B and 3A.

Sagebrush steppe and grasslands are the two primary vegetation types that would be impacted by Zone 3 alternatives. The differences between these three alternatives are in the relative composition of their impacts. For example, Alternative 3B would impact more grassland habitat than Alternatives 3A or 3C, whereas Alternatives 3A and 3C would impact nearly 1.5 times more sagebrush than Alternative 3B. Transmission line impacts along Alternative 3A would potentially impact twice as much riparian/wetland habitat than the other Zone 3 alternatives (Table 3.10-6).

Alternatives 3B and 3C would require substantially more new access roads compared to Alternative 3A. These new access roads could be expected to primarily impact grasslands and sagebrush steppe (Table 3.10-7).

Zone 4. Alternative 4A is the shortest of all the alternatives (20 miles) and so would have the least permanent and short-/long-term impact of all of the proposed route alternatives. The main type of vegetation adversely affected by this alternative would be sagebrush (Tables 3.10-6 and 3.10-7). However, impacts to shrublands (i.e., bitterbrush) and riparian/wetland areas are also proportionally high given the relatively short length of this alternative. New road construction and overland routes would primarily impact sagebrush steppe, though some riparian/wetland areas would likely need to be crossed, especially by overland routes.

Zone 5. The four alternatives in Zone 5 are the longest route alternatives and are all similar in length, ranging from 107 miles (Alternative 5A) to more than 117 miles (Alternative 5C) (Table 3.10-5). Because it is the longest, Alternative 5C would have the greatest total vegetative impact in Zone 5. The majority of these impacts, as well as the impacts in the other Zone 5 alternatives, would be caused by short-/long-term impacts associated with transmission line construction.

Sagebrush steppe is the primary vegetation type impacted by all four alternatives, though anthropogenic (i.e., center pivot agriculture) areas are also prevalent in Alternative 5C and would also be substantially impacted by this alternative (Tables 3.10-6 and 3.10-7). Impacts to riparian/wetland areas would be similar among all four alternatives in this zone; however, Alternative 5A is expected to have the least impact to that habitat type.

Alternative 5A traverses the INL Site and the Sagebrush Steppe Ecosystem Reserve (SSER). This alternative parallels an existing utility corridor, but it appears to be non-compliant with the SSER management plan, which states that all new utility corridors must occur within State Highway rights-of-way (DOE 2004). Without special planning and implementation, Alternative 5A would be non-compliant with the requirement to use locally collected seed or transplants for revegetation efforts (DOE 2004),

Of the four alternatives in Zone 5, Alternative 5C is expected to require the most mileage of both new access roads and overland routes (Table 3.10-7). Conversely, Alternative 5A would require the least. Areas of rock/sparse vegetation (i.e., vegetated lava) and irrigated agricultural lands would be substantially more impacted by new roads under Alternative 5C compared with the other Zone 5 alternatives.

Zone 6. At more than 107 miles, Alternative 6A is tied with Alternative 5A as the fourth longest of all route alternatives for the proposed project and is projected to have the greatest overall impact to vegetative resources (Table 3.10-5). The vast majority of vegetative impacts would occur to sagebrush habitats and would be short-/long-term types of impacts caused by transmission line construction. The percentage of sagebrush cover in this zone is variable, with grass species comprising a significant amount of the total cover.

3.10.3 Rangeland Health

3.10.3.1 Environmental Setting

Livestock grazing is an important economic and cultural use of the vegetative (primarily grasslands, shrublands, and sagebrush steppe) and water resources in the project area. The USFS- and BLM-administered public lands are divided into management units called grazing allotments. These grazing

allotments contain federal lands, and frequently include private and state lands. Private and state grazing lands also occur in the project area outside of federally administered grazing allotments.

To gauge the effect livestock use is having on public and private lands within each grazing allotment, rangeland health assessments are periodically conducted. Rangeland health is described by the Society for Range Management (SRM 1999) as “The degree to which the integrity of the soil, vegetation, water, and air, as well as the ecological processes of the rangeland ecosystem, are balanced and sustained. Integrity is defined as maintenance of the structure and functional attributes characteristic of a locale, including normal variability.” Rangeland health assessments may also be occurring on privately held lands, but that information is not publicly available.

Grazing allotments occur on USFS, BLM, state, and private lands in the project area, though the vast majority of these allotments occur on BLM lands (Figure 3.10-1). An interdisciplinary team of BLM or USFS specialists (e.g., range management specialists, soils scientists, and hydrologists) evaluates rangeland health of grazing allotments against specific state or agency standards. Rangeland health standards differ slightly between states (and agencies), but on BLM lands they all address the four Fundamentals of Rangeland Health identified by the BLM as the ecological principles governing the sustainable use of public rangelands. These four Fundamentals of Rangeland Health are described in 43 CFR 4180 as:

1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian/wetland, and aquatic components; soil and plant conditions support water infiltration, soil moisture storage, and release of water that are in balance with climate and landform, and maintain or improve water quality, water quantity, and timing and duration of flow.
2. Ecological processes, including the hydrologic cycle, nutrient cycles, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.
3. Water quality complies with state water quality standards and achieves, or is making progress toward achieving, established BLM management objectives, such as meeting wildlife needs.
4. Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal proposed, Federal candidate, other special status species, native species, and for economically valuable game species and livestock.

In Montana, the Butte and Dillon BLM field offices evaluate rangeland health of an allotment based on the following five standards (BLM 2005a; 2008):

1. Uplands are in proper functioning condition.
2. Riparian and wetland areas are in proper functioning condition.
3. Water quality meets State standards.
4. Air quality meets State standards.
5. Provide habitat as necessary, to maintain a viable and diverse population of native plant and animal species, including special status species (i.e., biodiversity).

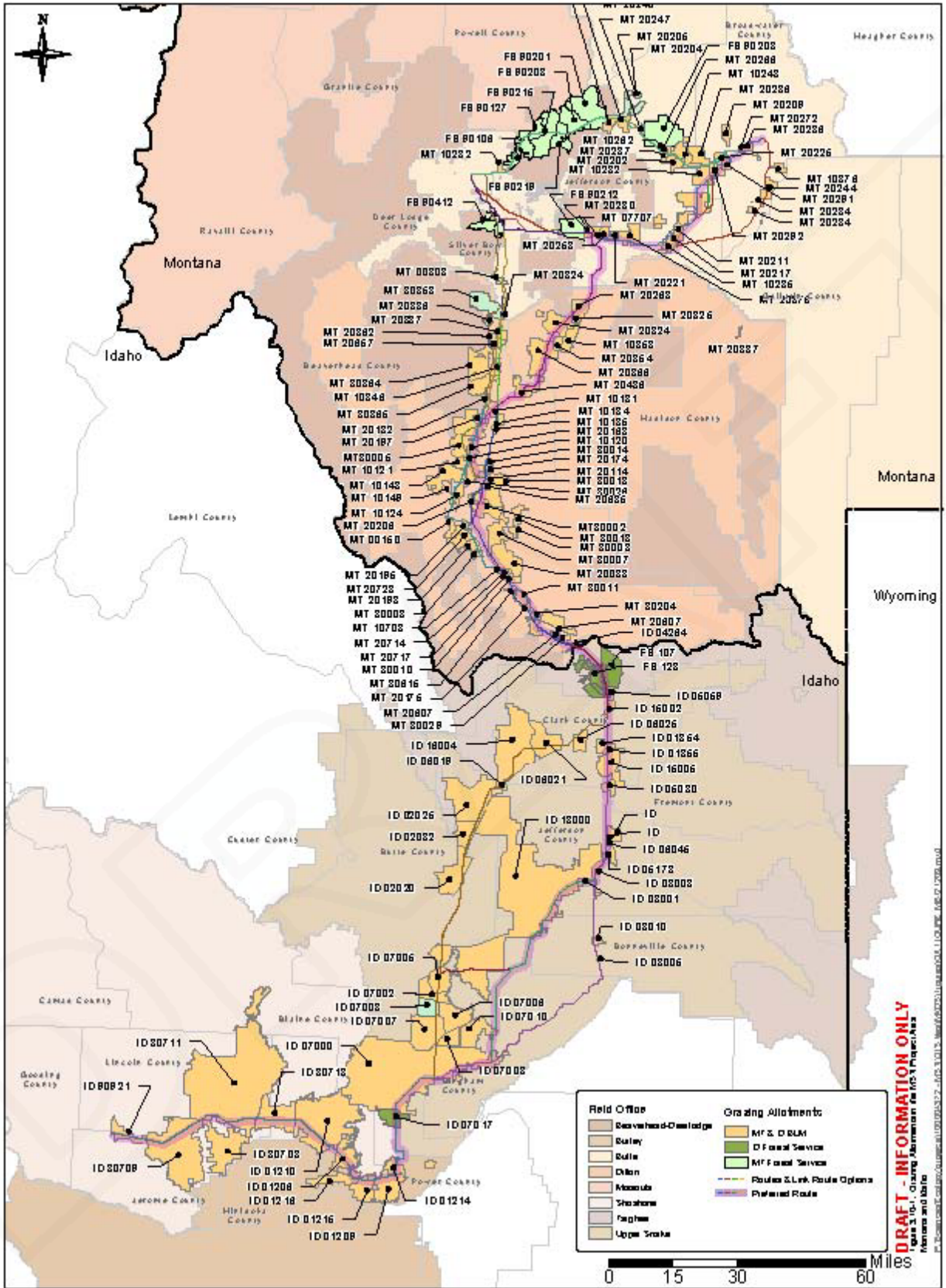


Figure 3.10-1. Grazing Allotments by Ownership through the Proposed Project Corridor

The BDNF grazing allotments in the project area were last evaluated in the 1970s when the primary cattle range portions of these allotments were evaluated (Godbolt 2009). Allotments were evaluated based on their condition compared to a climax community and rated by the percentage of climax plant species that were present. Rating categories were as follows: excellent (76 to 100 percent), good (51 to 75 percent), fair (26 to 50 percent), or poor (0 to 25 percent).

Ninety-five allotments are in the Montana portion of the proposed project area (Figure 3.10-1). Thirty-two allotments occur in the Butte Field Office, 54 occur in the Dillon Field Office, and 9 occur on the BDNF portions of the proposed project area in Montana. Generally, BLM grazing allotments in the Montana portion are meeting most of the evaluation criteria (Appendix C.10.5). Roughly 96 percent of the USFS grazing allotments in the Montana portion are thought to be in the good to fair categories (Table 3.10-8).

In Idaho the Upper Snake, Shoshone, and Burley BLM field offices evaluate rangeland health based on the following eight standards (BLM 1997):

1. Watersheds provide for the proper infiltration, retention, and release of water appropriate to soil type, vegetation, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
2. Riparian-wetland areas are in properly functioning condition appropriate to soil type, climate, geology, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
3. Stream channels and floodplains are properly functioning relative to the geomorphology (e.g., gradient, size, shape, roughness, confinement, and sinuosity) and climate to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
4. Healthy, productive, and diverse native animal habitat and populations of native plants are maintained or promoted as appropriate to soil type, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
5. Rangelands seeded with mixtures, including predominately non-native plants, are functioning to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle.
6. Exotic plant communities, other than seedlings, will meet minimum requirements of soil stability and maintenance of existing native and seeded plants. These communities will be rehabilitated to perennial communities when feasible, cost-effective methods are developed.
7. Surface and groundwater on public lands comply with the Idaho Water Quality Standards.
8. Habitats are suitable to maintain viable populations of threatened and endangered, sensitive, and other special status species.

Rangeland health of grazing allotments on the CTNF is evaluated based on the following four criteria:

1. Non-native invasive plant species
2. Percentage of ground cover (varies by cover type)
3. Percentage of shrub cover
4. Desired species composition

Forty-seven allotments are in the Idaho portion of the proposed project area (Figure 3.10-1). Forty-six of these are on BLM lands and 1 is on USFS lands. There are 34 allotments in the Upper Snake Field Office, 6 in the Burley Field Office, and 5 in the Shoshone Field Office management areas. Of the BLM-managed allotments in Idaho, most are meeting the applicable standards. For those not meeting the standards, livestock grazing is not a contributing factor to the standards not being met (Appendix C.10.5).

In addition, the East Beaver C&H allotment on the CTNF is within the proposed project area. This allotment is considered to be “functioning at risk” because of the presence of noxious weeds on the allotment (McCoy 2009).

Table 3.10-8. Summary of Grazing Allotments Traversed by Proposed Project Alternatives

Agency	Number of Allotments Crossed By Alternative																	
	1A	1B	1C	1D	2A	2B	2C	2D	2E	3A	3B	3C	4A	5A	5B	5C	5D	6A
Montana																		
Beaverhead-Deerlodge National Forest	7	2	1	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0
BLM-Butte Field Office	15	15	9	15	0	0	1	0	1	0	0	0	0	0	0	0	0	0
BLM-Dillon Field Office	0	0	0	0	7	5	5	5	5	26	22	24	0	0	0	0	0	0
Subtotal	22	17	10	15	8	6	8	6	6	26	22	24	0	0	0	0	0	0
Idaho																		
Caribou-Targhee National Forest	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
BLM-Upper Snake Field Office	0	0	0	0	0	0	0	0	0	0	0	0	3	14	16	12	12	2
BLM-Shoshone Field Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
BLM-Burley Field Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	4	14	16	12	12	13
Total	22	17	10	15	8	6	8	6	6	26	22	24	4	14	16	12	12	13

3.10.3.2 Analysis Methods

A GIS overlay process was used to analyze impacts to grazing allotments in the proposed project corridor. This process is described in detail in Section 3.10.2.2.

3.10.3.3 Impact Analysis

No Action Alternative

Under the no action alternative, no impacts would occur to grazing allotments from construction of the proposed project or associated new roads or overland routes. Ongoing impacts would continue to occur to grazing allotments from livestock grazing, as well as from other projects or road maintenance in the area.

Action Alternatives

Section 3.10.2.3 describes the types of indirect and direct impacts to vegetation. The same types of indirect and direct impacts would also occur to federal grazing allotments and state and private grazing lands and have relevance to future rangeland health assessments conducted on the affected allotments.

Direct and indirect impacts to grazing allotments and other grazing lands are directly proportional to the miles crossed by any given alternative. Those alternatives that cross more miles of grazing allotments/grazing lands require more ground disturbance (e.g., towers and access roads) and therefore have higher permanent and short-/long-term impacts (Table 3.10-9). Overall impacts from combined transmission line and new access road/overland route impacts to grazing allotments by alternatives range from about 119 acres (Alternative 2B) to more than 1,350 acres (Alternative 6A). A more detailed, allotment by allotment evaluation is in Appendix C.10.5. Impacts to all grazing lands within an alternative can, in general, be estimated by referring to impact calculations for grasslands, sagebrush steppe, and shrublands in Tables 3.10-6 and 3.10-7. The focus here is on federally administered grazing allotments because this is a specific BLM requirement.

With the exception of forest clearing, permanent impacts to grazing allotments and other private and state grazing lands typically represent a loss in forage for livestock and wildlife. Forest clearing, though a permanent impact to forest habitat, can improve forage availability in areas where it was relatively scarce before construction. Impacts associated with new roads typically represent a loss in forage, though the additional roads may facilitate livestock management and result in better livestock distribution and forage utilization. Short-/long-term impacts represent a temporary loss of forage and the possibility of degrading rangeland health through the introduction and/or spread of noxious weeds that may be less suitable forage.

Of the four Fundamentals of Rangeland Health described in Section 3.10.3.1, the issue of primary concern on grazing allotments and other grazing lands with regard to the proposed project is not loss of forage but that of degraded rangeland health resulting in noxious weed and cheatgrass invasion facilitated by the proposed project. For this reason, the magnitude of short-/long-term direct impacts is likely to be more important to the long-term rangeland health of grazing allotments/grazing lands in the proposed project area than permanent (i.e., residual) impacts are. Generally, the greater the land disturbance, the greater the opportunity for noxious weeds, cheatgrass, and other invasive plants to become established and increase their extent across the landscape.

Table 3.10-9. Summary of Projected Impacts to Grazing Allotments by Agency Caused by the Proposed Project Route Alternatives*

Alternative	Impact Type**	Montana				Idaho				Total
		Beaverhead-Deerlodge NF	BLM-Butte Field Office	BLM-Dillon Field Office	Caribou-Targhee NF	BLM-Upper Snake Field Office	BLM-Burley Field Office	BLM-Shoshone Field Office		
Zone 1										
1A	Miles of transmission line	31	27	0	0	0	0	0	0	58
	Miles of new road	25	24	0	0	0	0	0	0	48
	Miles of overland routes	0	3	0	0	0	0	0	0	3
	Permanent impact (acres)	136	127	0	0	0	0	0	0	262
	Short-/long-term impact (acres)	313	286	0	0	0	0	0	0	599
	Total impact (acres)	449	413	0	0	0	0	0	0	861
1B	Miles of transmission line	6	25	0	0	0	0	0	0	31
	Miles of new road	1	21	0	0	0	0	0	0	21
	Miles of overland routes	2	5	0	0	0	0	0	0	7
	Permanent impact (acres)	15	121	0	0	0	0	0	0	135
	Short-/long-term impact (acres)	68	306	0	0	0	0	0	0	374
	Total impact (acres)	83	427	0	0	0	0	0	0	510
1C	Miles of transmission line	5	18	0	0	0	0	0	0	22
	Miles of new road	1	5	0	0	0	0	0	0	6
	Miles of overland routes	2	3	0	0	0	0	0	0	5
	Permanent impact (acres)	12	37	0	0	0	0	0	0	49
	Short-/long-term impact (acres)	52	190	0	0	0	0	0	0	242
	Total impact (acres)	64	228	0	0	0	0	0	0	291

Table 3.10-9. Summary of Projected Impacts to Grazing Allotments by Agency Caused by the Proposed Project Route Alternatives*

Alternative	Impact Type**	Montana				Idaho				Total
		Beaverhead-Deerlodge NF	BLM-Butte Field Office	BLM-Dillon Field Office	Caribou-Targhee NF	BLM-Upper Snake Field Office	BLM-Burley Field Office	BLM-Shoshone Field Office		
1D	Miles of transmission line	0	25	0	0	0	0	0	25	
	Miles of new road	0	21	0	0	0	0	0	21	
	Miles of overland routes	0	5	0	0	0	0	0	5	
	Permanent impact (acres)	0	117	0	0	0	0	0	117	
	Short-/long-term impact (acres)	0	287	0	0	0	0	0	287	
	Total impact (acres)	0	404	0	0	0	0	0	404	
Zone 2										
2A	Miles of transmission line	2	1	14	0	0	0	0	17	
	Miles of new road	0	1	0.3	0	0	0	0	1.7	
	Miles of overland routes	0.1	0	0	0	0	0	0	0.1	
	Permanent impact (acres)	3	7	31	0	0	0	0	41	
	Short-/long-term impact (acres)	16	13	148	0	0	0	0	177	
	Total impact (acres)	20	20	179	0	0	0	0	218	
2B	Miles of transmission line	2	1	6	0	0	0	0	9	
	Miles of new road	0	1	5	0	0	0	0	6	
	Miles of overland routes	0.1	0	2	0	0	0	0	2	
	Permanent impact (acres)	3	7	28	0	0	0	0	38	
	Short-/long-term impact (acres)	16	13	72	0	0	0	0	101	
	Total impact (acres)	20	20	99	0	0	0	0	139	

Table 3.10-9. Summary of Projected Impacts to Grazing Allotments by Agency Caused by the Proposed Project Route Alternatives*

Alternative	Impact Type**	Montana				Idaho				Total
		Beaverhead-Deerlodge NF	BLM-Butte Field Office	BLM-Dillon Field Office	Caribou-Targhee NF	BLM-Upper Snake Field Office	BLM-Burley Field Office	BLM-Shoshone Field Office		
2C	Miles of transmission line	6	2	27	0	0	0	0	35	
	Miles of new road	1	.4	36	0	0	0	0	38	
	Miles of overland routes	2	0	0	0	0	0	0	2	
	Permanent impact (acres)	5	6	162	0	0	0	0	173	
	Short-/long-term impact (acres)	52	22	271	0	0	0	0	345	
	Total impact (acres)	57	28	432	0	0	0	0	518	
2D	Miles of transmission line	6	1	19	0	0	0	0	26	
	Miles of new road	5	2	23	0	0	0	0	29	
	Miles of overland routes	0	0	0	0	0	0	0	0	
	Permanent impact (acres)	26	8	107	0	0	0	0	141	
	Short-/long-term impact (acres)	57	14	196	0	0	0	0	267	
	Total impact (acres)	83	21	303	0	0	0	0	408	
2E	Miles of transmission line	0	0.3	27	0	0	0	0	27	
	Miles of new road	0	0.4	27	0	0	0	0	28	
	Miles of overland routes	0	0	0	0	0	0	0	0	
	Permanent impact (acres)	0	2	162	0	0	0	0	164	
	Short-/long-term impact (acres)	0	3	271	0	0	0	0	274	
	Total impact (acres)	0	5	432	0	0	0	0	437	

Table 3.10-9. Summary of Projected Impacts to Grazing Allotments by Agency Caused by the Proposed Project Route Alternatives*

Alternative	Impact Type**	Montana				Idaho				Total
		Beaverhead-Deerlodge NF	BLM-Butte Field Office	BLM-Dillon Field Office	Caribou-Targhee NF	BLM-Upper Snake Field Office	BLM-Burley Field Office	BLM-Shoshone Field Office		
Zone 3										
3A	Miles of transmission line	0	0	46	0	0	0	0	0	46
	Miles of new road	0	0	21	0	0	0	0	0	21
	Miles of overland routes	0	0	3	0	0	0	0	0	3
	Permanent impact (acres)	0	0	158	0	0	0	0	0	158
	Short-/long-term impact (acres)	0	0	473	0	0	0	0	0	473
	Total impact (acres)	0	0	631	0	0	0	0	0	631
3B	Miles of transmission line	0	0	34	0	0	0	0	0	34
	Miles of new road	0	0	44	0	0	0	0	0	44
	Miles of overland routes	0	0	2	0	0	0	0	0	2
	Permanent impact (acres)	0	0	197	0	0	0	0	0	197
	Short-/long-term impact (acres)	0	0	349	0	0	0	0	0	349
	Total impact (acres)	0	0	546	0	0	0	0	0	546
3C	Miles of transmission line	0	0	46	0	0	0	0	0	46
	Miles of new road	0	0	54	0	0	0	0	0	54
	Miles of overland routes	0	0	4	0	0	0	0	0	4
	Permanent impact (acres)	0	0	253	0	0	0	0	0	253
	Short-/long-term impact (acres)	0	0	469	0	0	0	0	0	469
	Total impact (acres)	0	0	722	0	0	0	0	0	722

Table 3.10-9. Summary of Projected Impacts to Grazing Allotments by Agency Caused by the Proposed Project Route Alternatives*

Alternative	Impact Type**	Montana				Idaho			Total
		Beaverhead-Deerlodge NF	BLM-Butte Field Office	BLM-Dillon Field Office	Caribou-Targhee NF	BLM-Upper Snake Field Office	BLM-Burley Field Office	BLM-Shoshone Field Office	
Zone 4									
4A	Miles of transmission line	0	0	0	6	6	0	0	12
	Miles of new road	0	0	0	5	3	0	0	8
	Miles of overland routes	0	0	0	2	1	0	0	3
	Permanent impact (acres)	0	0	0	27	20	0	0	47
	Short-/long-term impact (acres)	0	0	0	66	62	0	0	128
	Total impact (acres)	0	0	0	93	82	0	0	175
Zone 5									
5A	Miles of transmission line	0	0	0	0	76	0	0	76
	Miles of new road	0	0	0	0	7	0	0	7
	Miles of overland routes	0	0	0	0	10	0	0	10
	Permanent impact (acres)	0	0	0	0	180	0	0	180
	Short-/long-term impact (acres)	0	0	0	0	808	0	0	808
	Total impact (acres)	0	0	0	0	988	0	0	988
5B	Miles of transmission line	0	0	0	0	76	0	0	76
	Miles of new road	0	0	0	0	12	0	0	12
	Miles of overland routes	0	0	0	0	12	0	0	12
	Permanent impact (acres)	0	0	0	0	160	0	0	160
	Short-/long-term impact (acres)	0	0	0	0	811	0	0	811
Total impact (acres)	0	0	0	0	972	0	0	972	

Table 3.10-9. Summary of Projected Impacts to Grazing Allotments by Agency Caused by the Proposed Project Route Alternatives*

Alternative	Impact Type**	Montana				Idaho			Total
		Beaverhead-Deerlodge NF	BLM-Butte Field Office	BLM-Dillon Field Office	Caribou-Targhee NF	BLM-Upper Snake Field Office	BLM-Burley Field Office	BLM-Shoshone Field Office	
5C	Miles of transmission line	0	0	0	0	39	0	0	39
	Miles of new road	0	0	0	0	0.4	0	0	0.4
	Miles of overland routes	0	0	0	0	14	0	0	14
	Permanent Impact (acres)	0	0	0	0	84	0	0	84
	Short-/long-term impact (acres)	0	0	0	0	443	0	0	443
	Total impact (acres)	0	0	0	0	526	0	0	526
5D	Miles of Transmission Line	0	0	0	0	54	0	0	54
	Miles of new road	0	0	0	0	6	0	0	6
	Miles of overland routes	0	0	0	0	16	0	0	16
	Permanent Impact (acres)	0	0	0	0	129	0	0	129
	Short-/long-term impact (acres)	0	0	0	0	590	0	0	590
	Total impact (acres)	0	0	0	0	719	0	0	719
Zone 6									
6A	Miles of transmission line	0	0	0	0	16	33	43	92
	Miles of new road	0	0	0	0	15	10	29	54
	Miles of overland routes	0	0	0	0	0	13	11	24
	Permanent Impact (acres)	0	0	0	0	76	100	173	349
	Short-/long-term impact (acres)	0	0	0	0	161	374	467	1,002
	Total impact (acres)	0	0	0	0	237	474	640	1,351

* This table focuses on federally administered grazing allotments because this is a specific BLM requirement; however, impacts to all grazing lands within an alternative can, in general, be estimated by referring to impact calculations for grasslands, sagebrush steppe, and shrublands (Tables 3.10-6 and 3.10-7).

** Impact calculations do not include impacts associated with forest clearing. On most allotments, forest clearing would be relatively minimal or non-existent, and where it would occur is generally expected to increase forage production for livestock.

The zone-specific discussions below focus on federally administered grazing allotments because this is a specific BLM requirement; however, impacts to all grazing lands within an alternative can, in general, be estimated by referring to impact calculations for grasslands, sagebrush steppe, and shrublands (Tables 3.10-6 and 3.10-7). Projected impacts to state lands are also provided by vegetation type by alternative in Appendix C.10.3.

Zone 1. Alternative 1A would have the greatest direct impact to grazing allotments of the four alternatives in Zone 1. Permanent and short-/long-term impacts associated with Alternative 1A are both projected to be the greatest of the Zone 1 alternatives. Short-/long-term impacts are also greatest for Alternative 1A compared to the other three Zone 1 alternatives. This is primarily because more miles of proposed transmission line would cross grazing allotments in Alternative 1A than the other alternatives.

Construction of the transmission line through forested habitat in Alternative 1A may increase overall forage availability to livestock on affected allotments, even though some forage would undoubtedly be lost to infrastructure and new roads. In addition, new access roads in any of the alternatives, but especially in the forested portions of Alternative 1A, may facilitate a higher level of livestock management and thereby improve rangeland health of the affected allotments.

Zone 2. Of the five Zone 2 alternatives, Alternatives 2C and 2E stand out, both in terms of the high number of short-/long-term direct impacts associated with transmission line construction and for the substantially greater amount of permanent new access road impact. Zone 2 alternatives are ranked in the following descending order based on their level of projected residual impact to grazing allotments: 2C, 2E, 2D, 2A, and 2B. The same ranking order applies to projected short-/long-term impacts. Alternative 2A would have the least amount and Alternative 2E would have the greatest direct impact caused by new roads and overland routes.

Zone 3. The three alternatives in Zone 3 are ranked as follows (in descending order) based on their projected short-/long-term impacts to grazing allotments: 3A, 3C, and 3B. Alternative 3C would have the greatest total impact to grazing allotments and would require the most miles of new roads and overland routes.

Zone 4. The five grazing allotments in Alternative 4A (Appendix C.10.5) would primarily be temporarily impacted by construction of the proposed project. Impacts from new road construction are substantially greater than those projected for overland routes.

Zone 5. Substantially greater direct impacts to grazing allotments would occur in Alternatives 5A and 5B as compared to Alternatives 5C or 5D. When short-/long-term impacts are considered, the ranking of these alternatives is (in descending order): 5B, 5A, 5D, and 5C. Alternative 5B is anticipated to require the most new road construction of any of the Zone 5 alternatives.

Zone 6. Projected grazing allotment impacts are the greatest for Alternative 6A than for of any of the alternatives in the other zones. The majority of these direct impacts would be temporary and are associated with construction of the proposed project. It is expected that roughly 54 miles of new road and 24 miles of overland routes would need to be constructed/utilized on grazing allotments in this alternative (Table 3.10-9).

The zone-specific discussions below focus on federally administered grazing allotments because this is a specific BLM requirement; however, impacts to all grazing lands within an alternative can, in general, be estimated by referring to impact calculations for grasslands, sagebrush steppe, and shrublands (Tables 3.10-6 and 3.10-7). Projected impacts to state lands are also provided by vegetation type by alternative in Appendix C.10.3.

Zone 1. Alternative 1A would have the greatest direct impact to grazing allotments of the four alternatives in Zone 1. Permanent and short-/long-term impacts associated with Alternative 1A are both projected to be the greatest of the Zone 1 alternatives. Short-/long-term impacts are also greatest for Alternative 1A compared to the other three Zone 1 alternatives. This is primarily because more miles of proposed transmission line would cross grazing allotments in Alternative 1A than the other alternatives.

Construction of the transmission line through forested habitat in Alternative 1A may increase overall forage availability to livestock on affected allotments, even though some forage would undoubtedly be lost to infrastructure and new roads. In addition, new access roads in any of the alternatives, but especially in the forested portions of Alternative 1A, may facilitate a higher level of livestock management and thereby improve rangeland health of the affected allotments.

Zone 2. Of the five Zone 2 alternatives, Alternatives 2C and 2E stand out, both in terms of the high number of short-/long-term direct impacts associated with transmission line construction and for the substantially greater amount of permanent new access road impact. Zone 2 alternatives are ranked in the following descending order based on their level of projected residual impact to grazing allotments: 2C, 2E, 2D, 2A, and 2B. The same ranking order applies to projected short-/long-term impacts. Alternative 2A would have the least amount and Alternative 2E would have the greatest direct impact caused by new roads and overland routes.

Zone 3. The three alternatives in Zone 3 are ranked as follows (in descending order) based on their projected short-/long-term impacts to grazing allotments: 3A, 3C, and 3B. Alternative 3C would have the greatest total impact to grazing allotments and would require the most miles of new roads and overland routes.

Zone 4. The five grazing allotments in Alternative 4A (Appendix C.10.5) would primarily be temporarily impacted by construction of the proposed project. Impacts from new road construction are substantially greater than those projected for overland routes.

Zone 5. Substantially greater direct impacts to grazing allotments would occur in Alternatives 5A and 5B as compared to Alternatives 5C or 5D. When short-/long-term impacts are considered, the ranking of these alternatives is (in descending order): 5B, 5A, 5D, and 5C. Alternative 5B is anticipated to require the most new road construction of any of the Zone 5 alternatives.

Zone 6. Projected grazing allotment impacts are the greatest for Alternative 6A than for of any of the alternatives in the other zones. The majority of these direct impacts would be temporary and are associated with construction of the proposed project. It is expected that roughly 54 miles of new road and 24 miles of overland routes would need to be constructed/utilized on grazing allotments in this alternative (Table 3.10-9).

3.10.4 Special Status Plant Species

3.10.4.1 Environmental Setting

Special status plant species are generally rare in a region, state, forest, or field office, but they can be locally abundant. Because of their relative scarcity, they can be more susceptible to extirpation from natural or human-induced change and so are tracked by agencies and/or natural heritage programs to prevent their extirpation. Special status plant species included in this section are federally listed threatened and endangered species, as well as plant species designated as sensitive by the USFS or BLM, and critically imperiled or imperiled species globally (G1 or G2) or within the state (S1 or S2), as determined by the Montana National Heritage Program (MTNHP) and the Idaho Conservation Data Center (IDCDC).

Plant species listed as federally threatened or endangered include those listed or proposed for listing by the USFWS as threatened or endangered. Only one federally listed plant species, Ute ladies'-tresses orchid (*Spiranthes diluvialis*), is known to occur in the counties potentially affected by the proposed project. In Montana the Ute ladies'-tresses orchid is found in alkaline wetlands, swales, and old, meander channels often on the edge of the wetland or in areas that are dry by mid-summer; its habitat is limited to areas within major river drainages (MNHP 2009). In Idaho it is found in similar habitat, described as subirrigated, alluvial soils along streams and rivers and their floodplains, including abandoned river channels, wet meadows, and open seepy areas (IDCDC 2009). In 2009 slick-spot pepper-grass (*Lepidium papilliferum*) was listed as threatened. This species occurs in southern Idaho; however, because the closest documented occurrences are nearly 50 miles from the proposed project area, it is considered unlikely to occur in the project area or otherwise be affected by any of the proposed alternatives.

A combined total of 188 special status plant species were evaluated for their potential to occur in the Idaho and Montana portions of the project area. Based on the availability of potentially suitable habitat and the proximity of documented occurrences, 90 plant species (63 in Montana and 27 in Idaho) were determined to occur, be likely to occur, or be somewhat likely to occur in the project area (Table 3.10-10). The remaining 98 species were determined unlikely to occur. Details on all species considered are in Appendices C.10.6 and C.10.7.

3.10.4.2 Analysis Methods

The list of special status plants potentially occurring in the project area was developed from the following sources: species listed as threatened or endangered under the ESA and listed by the USFWS as potentially occurring in the counties crossed by proposed project alternatives, sensitive species lists for forests and BLM districts in the project area, and documented occurrences in counties crossed by proposed project alternatives of species listed as at high risk (S1) or at risk (S2) in Montana or Idaho by MTNHP or IDCDC, respectively. Plant species potentially at risk (S3) with a Montana Native Plant Society threat ranking of highly threatened (category 1) or threatened (category 2) were also included. Plant species with the following classifications by the MTNHP or IDCDC that were not also listed by the BLM or USFS as sensitive were excluded from consideration: potentially at risk (S3) in Montana and Idaho; uncommon but not rare (S4); common, widespread, and abundant (S5); potential species of concern; or the status rank is not applicable (SNA) because the taxon is of hybrid origin, is exotic or introduced, is accidental, or is not confidently present in the state.

The likelihood of a special status plant species occurring in the project area was evaluated based on two primary factors: (1) the type of habitat suitable to a species and the relative availability of that habitat in the project area, and (2) the distance of documented occurrence of a species to the project area. These two factors were combined into the evaluation matrix (Table 3.10-11).

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Letterman's needlegrass	<i>Achnatherum lettermanii</i> (Syn. <i>Stipa lettermanii</i>)	G5S1				Occurs	3A, 3B, 3C
MT	Musk-root	<i>Adoxa moschatellina</i>	G5S2		X	X	Somewhat likely	1A
MT	Cusick's horse-mint	<i>Agastache cusickii</i>	G3G4S1		X	X	Somewhat likely	3A
MT	Western joepywe-weed	<i>Ageratina occidentalis</i> (Syn. <i>Eupatorium occidentale</i>)	G4S2		X		Somewhat likely	3A
ID	Iodine bush	<i>Allenrolfea occidentalis</i>	G4S1				Somewhat likely	5C
ID	Two-headed onion	<i>Allium anceps</i>	G4S2		X		Somewhat likely	6A
MT	Small onion	<i>Allium parvum</i>	G5S2S3			X	Somewhat likely	3A, 3C
MT	Sapphire rockcress	<i>Arabis fecunda</i>	G2S2		X	X	Likely	2A, 2B, 2C, 2D, 2E
ID	Lemhi milkvetch	<i>Astragalus aquilonius</i>	G3S3		X		Occurs	5A
ID	Mourning milkvetch	<i>Astragalus atratus</i> var. <i>inseptus</i>	G4G5T3S3		X		Somewhat likely	6A
ID	Two-grooved milkvetch	<i>Astragalus bisulcatus</i> var. <i>bisulcatus</i>	G5T5S2		X		Somewhat likely	4A

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Lesser rushy milkvetch	<i>Astragalus convallarius</i> var. <i>convallarius</i> (Syn. <i>A. junciformis</i>)	G5S2		X		Likely	3A, 3B, 3C
ID	Meadow milkvetch	<i>Astragalus diversifolius</i>	G2S2		X	X	Somewhat likely	5A
ID	Drummond's milkvetch	<i>Astragalus drummondii</i>	Not ranked		X		Somewhat likely	5A, 5B, 5C, 5D
ID	Plains milkvetch	<i>Astragalus gilviflorus</i>	G5S2		X		Likely	5A
ID	Picabo milkvetch	<i>Astragalus oniciformis</i>	G3S3		X		Likely	6A
ID	Snake River milkvetch	<i>Astragalus purshii</i> var. <i>ophiogenes</i>	G5T3S3		X		Somewhat likely	6A
MT	Bitterroot milkvetch	<i>Astragalus scaphoides</i>	G3S2		X	X	Occurs	3A, 3B, 3C
MT	Railhead milkvetch	<i>Astragalus terminalis</i>	G3S2		X		Occurs	3A, 3B, 3C
MT	Wedge-leaved saltbush	<i>Atriplex truncata</i>	G5S1				Somewhat likely	3A, 3B, 3C
MT	Hooker's balsamroot	<i>Balsamorhiza hookeri</i>	G5S1				Likely	3A, 3B, 3C
MT	Green molly	<i>Bassia americana</i> (Syn. <i>Kochia americana</i>)	G5S1		X		Occurs	2A, 2B
MT	Western moonwort	<i>Botrychium hesperium</i>	G3G4S2S3			X	Somewhat likely	1B, 1C, 2A, 2B, 2C

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Peculiar moonwort	<i>Botrychium paradoxum</i>	G2S2			X	Likely	1A
MT	Mojave brickellbush	<i>Brickellia oblongifolia</i>	G5S1				Likely	2A, 2B, 2D
ID	Winged-seed evening primrose	<i>Camissonia pterosperma</i>	G4S2		X		Likely	5A
ID	Buxbaum's sedge	<i>Carex buxbaumii</i>	Not ranked		X		Somewhat likely	6A
MT	Idaho sedge	<i>Carex idaho</i>	G2G3S2S3		X	X	Likely	2A, 2B, 2C, 2E, 2D, 3A, 3B, 3C
ID	Idaho sedge	<i>Carex idaho</i> (Syn. <i>Carex parryana</i> ssp. <i>idaho</i>)	G2S2		X		Likely	4A
MT	Steven's Scandinavian sedge	<i>Carex norvegica</i> ssp. <i>Stevenii</i>	G5TNRS1				Somewhat likely	1B, 1C, 2A, 2B, 2C, 3A, 3B, 3C
MT	Greater red Indian paintbrush	<i>Castilleja crista-galli</i>	G4(?)S1				Somewhat likely	3A, 3B, 3C
MT	Annual Indian paintbrush	<i>Castilleja minor</i> ssp. <i>minor</i> (Syn. <i>Castilleja exilis</i>)	G5S2		X		Likely	1A, 1B, 1C, 1D, 2C
ID	Lichen	<i>Catapyrenium congestum</i>	G4S2		X		Likely	5A
MT	Long-styled thistle	<i>Cirsium longistylum</i>	G3S3				Somewhat likely	1A

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
ID	Sepal-tooth dodder	<i>Cuscuta denticulata</i>	G4G5S1		X		Somewhat likely	4A
MT	Meadow larkspur	<i>Delphinium burkei</i>	G4S1S2				Somewhat likely	2A, 2B, 2D
MT	Dense-leaf draba	<i>Draba densifolia</i>	G5S2				Occurs	1B, 1C, 2C, 2E
MT	Beaked spikerush	<i>Eleocharis rostellata</i>	G5S2		X	X	Somewhat likely	1C, 2C, 2E
MT	Stream orchid	<i>Epipactis gigantea</i>	G3G4S2			X	Somewhat likely	1C, 2C
MT	Whitestem goldenbush	<i>Ericameria discoidea</i> var. <i>discoidea</i> (Syn. <i>Haplopappus macronema</i> var. <i>macronema</i>)	G4G5T4S1			X	Somewhat likely	2A, 2B, 2D
MT	Linearleaf fleabane	<i>Erigeron linearis</i>	G5S1		X		Likely	3C
MT	Buff fleabane	<i>Erigeron ochroleucus</i> var. <i>ochroleucus</i> (Syn. <i>E. parryi</i>)	G2S2		X		Occurs	1B, 1C, 1D, 2C, 2E, 3A, 3B, 3C
MT	Matted buckwheat	<i>Eriogonum caespitosum</i>	G5S1		X		Somewhat likely	3A, 3B, 3C
ID	Hooker's buckwheat	<i>Eriogonum hookeri</i>	G5S1				Somewhat likely	5C

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Railroad Canyon wild buckwheat	<i>Eriogonum soliceps</i>	G2S2		x		Occurs	3A, 3B, 3C
ID	Joepyee weed	<i>Eupatoriadelphus maculatus</i> var. <i>bruneri</i> (Syn. <i>Eupatorium maculatum</i> var. <i>bruneri</i>)	G5T4T5Q,SNR				Somewhat likely	5C
MT	Fabronia pusilla	<i>Fabronia pusilla</i>	G4G5S1				Somewhat likely	1B, 1C, 1D, 2C
MT	Hiker's gentian	<i>Gentianopsis simplex</i>	G5S1			x	Somewhat likely	3A, 3B, 3C
MT	Prostrate hutchinsia	<i>Hornungia procumbens</i> (Syn. <i>Hutchinsia procumbens</i>)	G5S1		x		Somewhat likely	3A, 3B, 3C
MT	Ballhead ipomopsis	<i>Ipomopsis congesta</i> ssp. <i>crebrifolia</i>	G5T3T4S1		x		Likely	3A, 3B, 3C
ID	Spreading gilia	<i>Ipomopsis polycladon</i>	G4S2		x		Likely	5A
ID	Hall's rush	<i>Juncus hallii</i>	Not ranked			x	Somewhat likely	5A, 5B, 5C, 5D
MT	Hall's rush	<i>Juncus hallii</i>	G4G5S2			x	Somewhat likely	1A, 1B, 2A, 2B, 2C, 2D, 2E
MT	Simple bog sedge	<i>Kobresia simpliciuscula</i>	G5S2		x		Somewhat likely	3A, 3B, 3C

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Keeled bladderpod	<i>Lesquerella carinata</i> var. <i>languida</i> (Syn. <i>Lesquerella paysonii</i> , <i>Physaria carinata</i>)	G3G4S1		x	x	Somewhat likely	2A, 2B, 2D
ID	Payson's bladderpod	<i>Lesquerella paysonii</i>	G3S2			x	Somewhat likely	4A
MT	Beautiful bladderpod	<i>Lesquerella pulchella</i>	G2S2		x	x	Likely	2A, 2D, 3A
MT	Taper-tip desert-parsley	<i>Lomatium attenuatum</i>	G3S2		x		Somewhat likely	3A, 3B, 3C
MT	Felwort	<i>Lomatogonium rotatum</i>	G5S1		x		Somewhat likely	3A, 3B, 3C
MT	Dwarf purple monkeyflower	<i>Mimulus nanus</i>	G5S1		x		Somewhat likely	1C
MT	Primrose monkeyflower	<i>Mimulus primuloides</i>	G4S2			x	Somewhat likely	3A
ID	Green muhly	<i>Muhlenbergia racemosa</i>	Not ranked		x		Somewhat likely	5A, 5B, 5C, 5D
MT	Low northern-rockcress	<i>Neotorularia humilis</i> (Syn. <i>Braya humilis</i>)	G5S1		x		Somewhat likely	2A, 2B, 2D
MT	Meadow pennycress	<i>Noccaea parviflora</i> (Syn. <i>Thlaspi parviflorum</i>)	G3S2		x		Likely	2A, 2B, 2C, 2E, 3A, 3B, 3C
ID	Hall's orthotrichum moss	<i>Orthotrichum hallii</i>	G5S1		x		Somewhat likely	5A

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Meadow lousewort	<i>Pedicularis crenulata</i>	G4S1		X		Likely	3B, 3C
MT	Lemhi beardtongue	<i>Penstemon lemhiensis</i>	G3S3		X	X	Likely	2A, 2B, 2C, 2E, 3A, 3B, 3C
MT	Hoary phacelia	<i>Phacelia incana</i>	G3G4S2		X		Likely	3A, 3B, 3C
ID	Obscure phacelia	<i>Phacelia inconspicua</i>	G2S1		X		Somewhat likely	5A
ID	Small-flowered ricegrass	<i>Piptatherum micranthum</i>	G5S1		X		Somewhat likely	5A
MT	Austin knotweed	<i>Polygonum douglasii austina</i>	G5T4S2S3		X		Somewhat likely	1C, 2C, 2E
MT	Alkali primrose	<i>Primula alcalina</i>	G2S1		X	X	Somewhat likely	3A, 3B, 3C
ID	Cusick's primrose	<i>Primula cusickiana</i>	Not ranked		X		Somewhat likely	6A
MT	Mealy primrose	<i>Primula incana</i>	G4G5S2		X		Likely	2A, 2B, 2C, 2E, 3A, 3B, 3C
MT	James stitchwort	<i>Pseudostellaria jamesiana</i> (Syn. <i>Stellaria jamesiana</i>)	G5S1		X		Somewhat likely	3A, 3B, 3C
MT	Lemmon's alkaligrass	<i>Puccinellia lemmonii</i>	G4S1		X		Somewhat likely	3A
MT	High-arctic buttercup	<i>Ranunculus hyperboreus</i>	G5S1				Somewhat likely	1B, 1C, 1D, 2C
MT	Straightbeak buttercup	<i>Ranunculus orthorhynchus</i>	G5S1				Somewhat likely	1A, 1B, 1C, 2A, 2B, 2D

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Northern buttercup	<i>Ranunculus pedatifidus</i>	G5S1		x		Somewhat likely	1A, 1B, 1C, 2A, 2B, 2D
ID	Red glasswort	<i>Salicornia rubra</i>	G4S2		x	x	Somewhat likely	5C
MT	Storm saxifrage	<i>Saxifraga tempestiva</i>	G2S2			x	Somewhat likely	2A, 2B, 2C, 2D, 2E
MT	White-stemmed globe-mallow	<i>Sphaeralcea munroana</i>	G4S1		x		Likely	3A, 3B, 3C
MT	Silver chicken sage	<i>Sphaeromeria argentea</i>	G4S1		x		Occurs	3A, 3B, 3C
MT	Ute ladies' tresses orchid	<i>Spiranthes diluvialis</i>	G2S1	x	x		Likely	1B, 1C, 1D, 2C, 2E
ID	Tall dropseed	<i>Sporobolus compositus</i> var. <i>compositus</i> (Syn. <i>Sporobolus asper</i>)	G5S1		x		Somewhat likely	6A
MT	Fleshy stitchwort	<i>Stellaria crassifolia</i>	G5S1				Somewhat likely	3A, 3B, 3C
MT	Rocky Mountain dandelion	<i>Taraxacum eriophorum</i>	G4S2		x		Somewhat likely	3A, 3B, 3C
MT	Alpine meadowrue	<i>Thalictrum alpinum</i>	G5S2		x	x	Likely	1A, 2D, 3A, 3B, 3C

Table 3.10-10. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur in the Proposed Project Area

State	Common Name	Scientific Name	MTNHP or IDCDC Status ¹	Listing Agency			Potential to Occur in Proposed Project Area ²	Alternative Closest to Known Occurrences
				USFWS	BLM	USFS		
MT	Arrow thelypody	<i>Thelypodium sagittatum</i> ssp. <i>sagittatum</i>	G4S2		X		Somewhat likely	3A, 3B, 3C
MT	Showy townsendia	<i>Townsendia florifera</i>	G5S1		X		Somewhat likely	3A, 3B, 3C

1 MTNHP/IDCDC ranks: G=global; S=state; T=subspecies or variety; 1=at high risk; 2=at risk; 3=potentially at risk; 4=apparently secure; common, widespread, abundant; ?=uncertainty in rank; NR=not ranked; Q=questionable taxonomy.

2 See Appendices C.10.6 and C.10.7 for detailed information on rationales for a species' potential to occur in the project area.

The availability of potentially suitable habitat in the proposed project area is based on habitat descriptions for documented occurrences versus what is known about habitats in the proposed project area. Knowledge of habitat types present in the proposed project area is not as detailed as site-specific mapping or descriptions for the sensitive species plants and so was evaluated in broader terms, such as whether this specific type of “sub-habitat” or niche could occur within the more general habitat type described for the project area. Information sources for special status plant habitat descriptions included MTNHP (2009b), NatureServe (2009), USDA PLANTS database (2009), USFS Fire Effects Information System (USFS 2009), Lady Bird Johnson Native Plants Database (NPIN 2009), CalFlora (2009), Flora of North America (2009), DeBolt and Rosentreter (1988), DeBolt (1989), Hagwood (2006), and McClain (1998).

Table 3.10-11. Occurrence Determination Evaluation Matrix for Special Status Plant Species in the Proposed Project Area

Proximity of Documented Occurrences to Alternative Centerlines (Miles)	Relative Availability of Potentially Suitable Habitat in the Proposed Project Area				
	High	Moderate	Low	Extremely Low/Scarce	None
0 (within 250 feet of centerline)	Occurs	Occurs	Occurs	Occurs	—
Less than 5	Likely	Likely	Somewhat likely	Unlikely	Unlikely
5 to 20	Somewhat likely	Somewhat likely	Unlikely	Unlikely	Unlikely
More than 20	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Undisclosed	See note	See note	See note	See note	See note

Note: In situations where the locations of documented occurrences of sensitive plant species was undisclosed, the number of occurrences in a county was used as a surrogate for distance. In general, and assuming that potentially suitable habitat occurs in the project area, it was assumed that the higher the number of documented occurrences, the greater the probability that an undocumented occurrence is in the project area. In these situations, it may not be possible to identify the magnitude of effect that specific alternatives could have on a species.

Distance from documented occurrences is used in this analysis because known occurrences represent seed sources and are indicators of habitat suitability in that area. Dispersal distances vary for different species and for environmental reasons (such as wind and herbivory, among several other factors). The distance ranges chosen are considered to be generally conservative (longer dispersal ranges) for most special status plant species in the project area, though it is recognized that some species that occur along rivers or floodplains may have the ability to disperse farther because of water carrying the seeds or propagules. Distance from documented occurrence has other implications in addition to seed dispersal. Specifically, it is logical to assume that if an occurrence is found in a certain locale, then the geologic, soil, micro-climate, and other factors are generally amenable to sustaining other occurrences of the same species in the area. Similarly, the farther one moves away from that known location, the factors sustaining or affecting the documented special status plant occurrence become less predictable, and therefore, are less reliable indicators of potential occurrence. Location data (in GIS format) for known populations of sensitive plant species were obtained in February 2009 from MTNHP (2009a) and the IDCDC (2009).

The current stage of the planning process (i.e., permitting and design) affords some flexibility in the placement of roads, towers, and other features. Avoidance of special status plant species and sensitive habitats may be feasible, and any roads or towers that intersect known populations of special status plants could potentially be moved. In addition, before construction or land disturbance of any kind, field botanical surveys of likely habitat types should be conducted during the optimal phenological period for

identification to prevent inadvertent impacts to any undocumented occurrences of special status plant species that may occur in the area.

Though impacts to special status plant species would likely be avoided, for the purposes of the impact analysis, potential impacts to special status plants were evaluated among alternatives based on: (1) the total number of species that occur, are likely to occur, or are somewhat likely to occur along a proposed transmission line route, (2) documented occurrences, and (3) the number of special status plant species considered likely to occur. More weight was given to items (2) and (3) because of the increased possibility of undocumented populations occurring and being inadvertently impacted, or by being indirectly impacted by noxious weed infestations or other types of indirect impact. It was assumed that there would be a higher likelihood of potential impact from the proposed project the higher the number of special status plant species reported for an alternative. Impacts are discussed in relative terms for alternatives in each zone.

3.10.4.3 Impact Analysis

No Action Alternative

Under the no action alternative, there would be no impacts to special status plant species caused by the proposed transmission line or associated roads. Ongoing impacts would occur to these plant species from noxious weeds, weed spraying, livestock grazing/trampling, all-terrain vehicle use, and other land-intensive projects in the area.

Action Alternatives

Indirect Impacts

The types of indirect impacts discussed in Section 3.10.2.3 are also applicable to special status plants. Noxious weeds and other invasive species such as cheatgrass are perhaps of even greater concern with regard to special status plants than they are to general vegetated habitats because there is the possibility that noxious weeds would precipitate the loss of a population of special status plant species. In fact, this is one of the foremost threats to many of the special status plant species identified by the MTNHP for sensitive plant species in the proposed project area, as well as in other parts of their range (MTNHP 2009). Changes in site hydrology are also a concern for special status plants because increases or decreases in soil moisture levels may alter specific micro-climate conditions necessary for their persistence at a particular location.

Direct Impacts

Generally, direct impacts to documented occurrences of special status plant species would be completely avoided by adjusting locations of towers, tensioning sites, staging areas, and new access roads. Presence/absence surveys would be conducted in appropriate habitats for special status plant species during final design (and before construction) to ensure that both documented and undocumented populations are avoided to the extent practicable. For additional information on mitigation measures, see Section 3.10.8.

Because substantial effort would be made to avoid direct impacts to special status plant species, the following discussion focuses on the probability of impact to special status plant species. The probability of impact is assumed to be greater in alternatives with the greater number of special status plant species that can potentially occur. Between 3 and 37 species of special status plants have the potential to occur within the project area for the various alternatives (Table 3.10-12). Occurrence determinations for all special status species evaluated are in Appendix C.10.6 (Montana) and C.10.7 (Idaho). Known occurrences of special status plants within 250 feet of alternative centerlines are in Appendix C.10.8.

Table 3.10-12. Summary of Special Status Plant Species that Occur, are Likely to Occur, or are Somewhat Likely to Occur per Proposed Project Alternative

	Alternative																	
	1A	1B	1C	1D	2A	2B	2C	2D	2E	3A	3B	3C	4A	5A	5B	5C	5D	6A
Count	8	11	13	5	18	17	16	13	9	37	32	34	4	12	3	7	3	7

Zone 1. Eight special status plant species are considered to potentially occur in Alternative 1A, none of which are known to occur. Three species are considered likely to occur in Alternative 1A, and the remaining five are somewhat likely to occur. In Alternative 1B, 11 species could potentially occur, two of which are known to occur, and two are considered likely to occur. The remaining seven species are considered somewhat likely to occur in Alternative 1B. Thirteen species could potentially occur in Alternative 1C, of which two are known to occur, two are likely to occur, and the remaining nine are considered somewhat likely to occur in Alternative 1C. Five species considered to potentially occur in Alternative 1D, the fewest of the Zone 1 alternatives. Of these five species, one is known to occur, two are considered likely to occur, and the remaining two are considered somewhat likely to occur. One of the species considered likely to occur in Alternatives 1B, 1C, and 1D is Ute ladies'-tresses orchid, a federally threatened species. However, of these three alternatives, Alternative 1C is closest to documented occurrences of the orchid. The weight of evidence presented here suggests that Alternative 1C likely poses the greatest risk to special status plant species in Zone 1, followed by Alternatives 1B, 1D, and 1A.

Zone 2. Of the five alternatives in Zone 2, Alternative 2A has the greatest number of potential occurrences of special status plant species. One of the 18 species potentially occurring in this alternative is known to occur, 7 are considered likely to occur, and the remaining 10 are considered somewhat likely to occur. Because of their proximity to one another, it is not surprising that Alternative 2B has a similar number of special status plant species potentially occurring in it. Seventeen species could potentially occur in Alternative 2B, with 1 known to occur, 6 considered likely to occur, and the remaining 10 considered somewhat likely to occur. Alternative 2C has 16 special status plant species that could potentially occur. Two species are known to occur, six are likely to occur, and the remaining eight are somewhat likely to occur. Alternative 2D has 13 special status plant species that could potentially occur, none of which are known to occur, five are likely to occur, and the remaining eight are considered somewhat likely to occur. Alternative 2E has the fewest number of special status plant species potentially occurring in Zone 2 alternatives. Nine species could potentially occur, two are known to occur, five are considered likely to occur, and the remaining two are somewhat likely to occur. One of the species considered likely to occur in Alternatives 2C and 2E is Ute ladies'-tresses orchid, a federally threatened species. Based on this information, it appears that Alternatives 2A, 2B, and 2C all pose a similar level of risk to special status plant species, followed by Alternative 2E and finally Alternative 2D, with the least amount of risk.

Zone 3. Of all the proposed project alternatives, those in Zone 3 have the greatest potential to impact special status plant species. All three Zone 3 alternatives have a similar number of special status plant species that could be potentially impacted by project activities. Six species are known to occur in all three alternatives. Within Alternative 3A, an additional 11 species are considered likely to occur, and the remaining 20 are considered somewhat likely to occur. Eleven special status plant species are also considered likely to occur in Alternative 3B, with the remaining 15 considered somewhat likely to occur. Alternative 3C has 12 species that are considered likely to occur; the remaining 16 are considered somewhat likely to occur. Based on this information, there is little to suggest that one alternative would pose a greater or lesser risk to special status plant species; all three alternatives pose considerable risk to these relatively rare plants.

Zone 4. No special status species are documented as occurring in Alternative 4A, and only one species is considered likely to occur. This species, Idaho sedge, has several documented occurrences in the vicinity of Alternative 4A. The remaining three species are all considered somewhat likely to occur in Alternative 4A.

Zone 5. Of all the Zone 5 alternatives, Alternative 5A has the greatest number of potential occurrences of special status plant species. Twelve species potentially occur in this alternative. One species is known to occur, four are likely to occur, and seven are somewhat likely to occur. All three species in Alternatives 5B and 5D are considered somewhat likely to occur. Seven special status plant species could potentially occur in Alternative 5C; however, all seven are considered somewhat likely to occur. This information indicates that Alternative 5A poses the greatest potential risk of impact to special status plant populations of the four alternatives in Zone 5, followed by Alternative 5C, with the least risk posed by Alternatives 5B and 5D.

Zone 6. With the exception of one species, all special status plant species that could potentially occur in Alternative 6A are considered somewhat likely to occur. The exception is considered likely to occur. No documented occurrences of sensitive plant species occur in Alternative 6A.

3.10.5 Impact Summary

3.10.5.1 Impact Summary Methods

Alternatives within each zone were ranked relative to each other based on four criteria. Alternatives in each zone were ranked based on the number of alternatives in an alternative with 1 being the lowest rank. For example, in Zone 1 where there are four alternatives, ranks go from 1 (with the lowest relative impact) to 4 (with the highest relative impact). Exceptions were made for cases where projected impacts were within 10 acres of one another for total permanent or total short-/long-term impact, or within one special status plant species of each other. This is considered to be within the tolerances of the disturbance model and “indicative” roads used to calculate impacts. The following four values were used to generate the overall level of potential impact:

1. Number of acres of total permanent impact (transmission line plus new access roads) to non-anthropogenic vegetative communities. This metric provides a way to gauge the total loss of habitat.
2. Number of acres of total short-/long-term impact to non-anthropogenic vegetative communities. This metric is intended to show the area most susceptible to noxious weed invasions.
3. Number of total riparian/wetland acres potentially disturbed. Though riparian/wetland areas would be avoided to the maximum extent practicable, it is assumed that the higher the level of potential impact to riparian/wetland areas, the less likely that complete avoidance would be possible and the higher the probability that at least some would be impacted.
4. Number of special status species populations that occur, are likely to occur, or somewhat likely to occur along an alternative, documented occurrences, and the number of special status plant species considered likely to occur. More weight was given to the second two considerations because of the increased possibility of undocumented populations occurring and being inadvertently impacted, or by being indirectly impacted by noxious weed infestations or other types of indirect impact. Though special status plant species would be avoided to the maximum extent possible, it is assumed that the higher the number of these occurrences, the higher the likelihood that these populations may be indirectly impacted.

3.10.5.2 Impact Summary Results

The alternatives most likely to cause the greatest adverse impacts to vegetative resources in the project area and to natural vegetation communities (excluding the anthropogenic cover type) are Alternatives 1A, 2C, 3A, 3C, 5A, and 5B (Table 3.10-13).

Table 3.10-13. Impact Summary Scoring for Proposed Project Route Alternatives¹

Alternative	Permanent Impact	Temporary Impact	Riparian/ Wetland Impact	Special Status Plants ²
Zone 1				
1A	4	4	4	1
1B	3	3	3	3
1C	2	2	2	4
1D	1	1	1	2
Zone 2				
2A	1	3	3	5
2B	2	2	4	5
2C	5	5	2	5
2D	4	4	5	3
2E	3	1	1	1
Zone 3				
3A	1	3	3	3
3B	2	1	2	3
3C	3	3	1	3
Zone 4				
4A	1	1	1	1
Zone 5				
5A	2	4	1	4
5B	4	4	2	1
5C	1	1	2	3
5D	2	1	2	1
Zone 6				
6A	1	1	1	1

¹ Comparisons of scores are only valid within zones. The higher the score, the higher the relative level of projected impact.

² Special status plant scoring does not account for undocumented populations that potentially occur in the project area.

3.10.6 Local Routing Options

The following discussion compares LROs to the comparable segment of the corresponding alternative. LROs are alternative routes for the proposed transmission line that have been developed to avoid a

particular resource. They are proposed for areas where agencies or the public have raised specific concerns about a particular proposed alignment. The potential impacts from the various LROs are discussed in this section in the same manner as for the overall transmission line. The LROs occur only in Montana. Impacts from LROs are presented but not compared to each other. Specific LROs may eventually replace a corresponding section of a main proposed alternative if the potential impacts to resources (e.g., wildlife, vegetation, land use, or visual resources) from the LRO are considered to be substantially less than those from the main transmission line alternative.

The impact analyses presented in this section follow the same procedures described previously for vegetation, rangeland health/grazing allotments, and special status plants. Table 3.10-14 lists LROs and the corresponding alternative portions they could replace. Projected impacts to specific vegetation cover types are in Appendix C.10.3. Figures showing the links and LROs by zone are presented in Section 3.1 (Figures 3.1-1 to 3.1-6).

Table 3.10-14. Local Routing Options and Portions of Alternatives They could Replace

LRO	Corresponding Alternatives
Beef Trail	1B, 2C
Boulder Hill	1A
Clark Canyon East	3B, 3C
Diamond Butte	3A, 3B, 3C
Fleecer	2D
Frying Pan Gulch	3B
Lima	3A, 3B, 3C
Lower Boulder	1B, 1D
Maiden Rock	2A, 2B
Mount Haggin	1B, 2A, 2B, 2C
North of Buxton	1B, 2C
Radersburg	1A
Rock Creek	2D
South of Butte 1	1B, 1C, 2C
Upper Boulder 1	1B, 1D
Upper Boulder 2	1B, 1D
Willow Creek	2B

Beef Trail. The Beef Trail LRO is roughly 2.7 miles long and is projected to directly impact approximately 33 acres of vegetative resources. Alternatives 1B and 2C have segments that correspond to this LRO, which would be replaced if this LRO is used. The corresponding segments of these two alternatives are also approximately 2.7 miles long and would have 9 acres more impact to vegetative resources than the LRO. Impact to the different vegetation cover types is similar between the LRO and the corresponding alternative segments. No grazing allotments are crossed by either the LRO or the corresponding alternative segments. One special status plant species is considered likely to occur in the LRO area. No species have been documented as occurring in this LRO. Based on this analysis, it appears that the LRO and the existing alternatives would have a similar level of impact on vegetative resources, but direct impacts to vegetation would be reduced slightly if the LRO were selected.

Boulder Hill. The Boulder Hill LRO is roughly 4.1 miles long, whereas the corresponding segment of Alternative 1A is 4.4 miles long. Because of this, the LRO would impact 10 fewer acres of vegetation than the corresponding alternative segment. However, the LRO could potentially impact approximately

Table 3.10-15. Summary of Projected Impacts to Vegetation Caused by Local Routing Options and Corresponding Links

LRO (Link Replaced)	Length (Alt. Segment) (Miles)	Transmission Line (Acres)			Roads (Acres)			Totals (Acres)		
		Short-/Long-Term (Alt. Segment)	Permanent (Alt. Segment)	Subtotal (Alt. Segment)	Short-/Long-Term (Alt. Segment)	Permanent (Alt. Segment)	Subtotal (Alt. Segment)	Short-/Long-Term (Alt. Segment)	Permanent (Alt. Segment)	Total (Alt. Segment)
Beef Trail (Link 7-2)	2.7 (2.7)	27.4 (27.5)	5.6 (5.7)	33 (33)	0 (5.5)	0 (3.2)	0 (9)	27 (33)	6 (9)	33 (42)
Boulder Hill (Link 2-3b)	4.1 (4.4)	38.8 (39.6)	15.2 (22.9)	54 (62)	0 (0)	9 (9.8)	9 (10) (10)	39 (40)	24 (33)	63 (73)
Clark Canyon East (Link 16-3c)	7.8 (8.7)	76.7 (85)	23 (27.6)	100 (113)	0 (0)	40.5 (45.9)	41 (46)	77 (85)	64 (74)	140 (159)
Diamond Butte (Link 17-4)	4.7 (4.8)	48.1 (48.7)	9.9 (10)	58 (59)	0 (0.9)	16.1 (12.9)	16 (14)	48 (50)	26 (23)	74 (73)
Fleecer (Link 28)	3.2 (2.5)	32.4 (25.8)	6.7 (5.3)	39 (31)	0 (0)	5.2 (7.7)	5 (8)	32 (26)	12 (13)	44 (39)
Frying Pan Gulch (Link 16-2)	4.8 (4.7)	48.9 (47.6)	10.1 (9.8)	59 (57)	0 (1)	12.8 (14)	13 (15)	49 (49)	23 (24)	72 (73)
Lima (Link 17-2)	13.5 (10.6)	137.9 (107.7)	28.4 (22.2)	166 (130)	4.3 (4.9)	28.6 (31.1)	33 (36)	142 (113)	57 (53)	199 (166)
Lower Boulder (Link 4-2b)	11.3 (10)	108.4 (68)	39.7 (102)	148 (170)	1.7 (3.4)	21 (34.2)	23 (38)	110 (71)	61 (136)	171 (207)
Maiden Rock (Link 11-3)	5 (5.1)	50.1 (51.7)	11.5 (10.7)	62 (62)	0 (0)	16.8 (0)	17 (0) (0)	50 (52)	28 (11)	78 (63)
Mount Haggin (Link 9-3)	1.7 (1.8)	16.6 (17.4)	4.8 (7.1)	21 (25)	0 (0)	4.5 (1.3)	4 (1)	17 (17)	9 (8)	26 (25)
North of Buxton (Link 7-4)	6.7 (7.2)	59.8 (64)	34 (38.8)	94 (103)	0 (6.7)	18.3 (13.1)	18 (20)	60 (71)	52 (52)	112 (123)
Radersburg (Link 2-2)	4.8 (4.3)	47.6 (42.6)	12.4 (11.4)	60 (54)	0 (6.4)	10.2 (5.1)	10 (11)	48 (49)	23 (17)	70 (66)
Rock Creek (Link 32)	4 (3.7)	40.3 (38.2)	9.8 (7.9)	50 (46)	0 (0)	15.5 (16.3)	16 (16)	40 (38)	25 (24)	66 (62)
South of Butte 1 (Link 6-2)	3.2 (2.5)	27.9 (23.7)	18.4 (8.8)	46 (32)	4.2 (7.9)	3.4 (0)	8 (8)	32 (32)	22 (9)	54 (41)
Upper Boulder 1 (Links 4-1b and 4-2a)	13.8 (13.6)	140.5 (123.7)	29 (64.2)	169 (188)	0 (6.2)	34.9 (37.1)	35 (43)	141 (130)	64 (101)	204 (231)
Upper Boulder 2 (Link 4-2a)	12.3 (11.3)	125.6 (100.5)	25.9 (59.5)	152 (160)	0 (6.2)	27.3 (32.3)	27 (39)	126 (107)	53 (92)	179 (199)
Willow Creek (14-2)	1.3 (1.3)	13.5 (13.6)	2.8 (2.8)	16 (16)	0 (0)	3.5 (6.5)	3 (6)	13 (14)	6 (9)	20 (23)

10 acres of riparian/wetland habitat, whereas the corresponding segment of Alternative 1A is projected to impact roughly 15 acres. Both the LRO and the corresponding segment of Alternative 1A cross the

Boomerang allotment (#20246) managed by the Butte Field Office. Several special status plant species are equally likely or somewhat likely to occur in either the LRO or the corresponding alternative segment; however, no documented occurrences of special status plant species occur within either of the proposed routes. Based primarily on the difference between projected impacts to riparian/wetland areas, the Boulder Hill LRO is preferable from a vegetation resource perspective.

Clark Canyon East. The Clark Canyon East LRO is approximately 7.8 miles long, 0.9 mile shorter than the 8.7 miles of the corresponding segment of Alternatives 3B and 3C. Because it is shorter, the LRO is expected to impact nearly 19 acres less than the corresponding segment of the two alternatives. The largest difference in the types of impact to vegetation is that the LRO would impact 5 fewer acres of forested habitat than the corresponding segment of Alternatives 3B and 3C. Both the Clark Canyon East LRO and the corresponding segment of Alternatives 3B and 3C cross the Clark Canyon (#30002) and Gallagher Mountain (#30013) grazing allotments. The alternative route also crosses the Clark Canyon Isolated allotment (#20206). Several special status plant species are equally likely or somewhat likely to occur in either the LRO or the corresponding alternative segment; however, no documented occurrences of special status plant species occur within either of the proposed routes. From a vegetation perspective, the proposed LRO is more favorable to vegetation resources than the corresponding segment of Alternatives 3B and 3C. This is because of the reduced overall impact the LRO represents relative to the alternative segment.

Diamond Butte. The Diamond Butte LRO is 4.7 miles long, which is slightly shorter than the 4.8-mile length of the corresponding segment of Alternatives 3A, 3B, and 3C. Because it would require about 1.1 miles more access road than the corresponding segment it would replace, the LRO would impact roughly 1 acre more vegetation than the projected 73 acres of impact caused by the corresponding segment of Alternatives 3A, 3B, and 3C. However, the LRO would likely impact 4 acres less riparian/wetland habitat than the alternatives. The Diamond Butte LRO would cross the Snowline Custodial (#20607) and Snowline (#30029) grazing allotments, while the corresponding alternative segment would cross a much shorter portion of the Snowline Custodial allotment. Though several special status plant species are equally likely to occur in either the LRO or the corresponding segment of Alternative 3A, 3B, or 3C, none have been documented as occurring in either of them. Because the LRO is projected to impact less riparian/wetland habitat, it is more favorable to vegetation resources than the corresponding segment of the mainline alternatives.

Fleecer. The Fleecer LRO is roughly 3.2 miles long, or about 0.7 mile longer than the corresponding segment of Alternative 2D, and is projected to impact approximately 44 acres of vegetative resources, compared to the 39 acres projected for the corresponding alternative segment. Both of these options would primarily impact grasslands. Neither the Fleecer LRO nor the corresponding segment of Alternative 1D crosses grazing allotments. One special status plant species is as equally likely to occur in the LRO as in the corresponding segment of Alternative 1D. From a vegetation viewpoint, there is little difference between these two options, except for a slightly larger impact (5 acres) to grasslands caused by the Fleecer LRO.

Frying Pan Gulch. The Frying Pan Gulch LRO is approximately 4.8 miles long, which is slightly longer than the 4.7 miles attributed to the corresponding segment of Alternative 3B. Projected impacts to vegetation for the Frying Pan Gulch LRO total 72 acres, which is about the same level of impact expected for the segment of Alternative 3B that corresponds to this LRO. There is little difference in the types of vegetation impacted; both would primarily impact grasslands and sagebrush steppe. The Frying Pan Gulch LRO would cross the Frying Pan (#10131) and Big Hole Road (#10135) grazing allotments. This is compared to the corresponding segment of Alternative 3B, which would cross those same two allotments as well as the Frying Pan Basin (#30691) and Hayden (#10134) grazing allotments. Several special status plant species are likely to occur in both the LRO and alternative areas, but no species have been

documented as occurring in either of them. Overall, there is little difference between the proposed LRO and the corresponding segment of Alternative 3B.

Lima. The Lima LRO is approximately 13.5 miles long, compared to 10.6 miles of the corresponding segment of Alternatives 3A, 3B, and 3C. Impacts to vegetation from this LRO are estimated at approximately 199 acres versus 166 acres for the corresponding segment of the Zone 3 alternatives. The types of vegetative impact would be similar, primarily grassland and sagebrush steppe. The Lima LRO would cross the Mosman (#30011), Railroad (#21075), Phalarope West (#30204), and Snowline (#30029) grazing allotments. The corresponding segment of Alternatives 3A, 3B, and 3C would cross those allotments, as well as the Red Butte SE (#30615) allotment. Several special status plant species occur in the vicinity of both the LRO and the corresponding alternative segment and are considered equally likely to occur in either route option. However, no species have been documented as occurring in either the LRO or the corresponding alternative segment. Based on the projected greater impacts caused by the LRO, the alternative segment is more favorable to vegetation resources than the Lima LRO.

Lower Boulder. The southern portion of the Lower Boulder LRO includes a segment of Alternative 1C, so it is comparable to the segment of Alternatives 1B and 1D that it would replace, if selected. The Lower Boulder LRO is roughly 11.3 miles long compared to the 10-mile segment of the corresponding alternative segment. This LRO would impact approximately 171 acres of vegetation, or approximately 36 acres less than the corresponding alternative segment. These impacts would occur primarily to the grassland, shrubland, and anthropogenic cover types. Under the corresponding segment of Alternatives 1B and 1D, forested lands would also be impacted. The Lower Boulder LRO could potentially impact one acre more riparian/wetland habitat than the corresponding alternative segment. The Lower Boulder LRO crosses two grazing allotments: Summit (#10282) and North Doherty (#20211). The corresponding segments of Alternatives 1B and 1D cross these same two allotments. One special status species has been documented as occurring on this LRO. No documented occurrences of special status species are in the corresponding segment of Alternatives 1B and 1D, though the same species that occurs in the LRO is also likely to occur in the corresponding alternative segment. Based on the greater impact that would occur under the corresponding segment of Alternatives 1B and 1D, the Lower Boulder LRO is more favorable to vegetation resources.

Maiden Rock. The Maiden Rock LRO is approximately 5 miles long, or only 0.1 mile shorter than the corresponding segment of Alternatives 2A and 2B. Roughly 78 acres of impact to vegetative resources is anticipated under this LRO, compared to 63 acres of impact estimated for the corresponding alternative segments. The main difference in these impacts is attributable to the increased number of new roads that would be needed for the LRO. The Maiden Rock LRO would cross the Vipond Glendale (#30358) and Peck SGC (#20336) grazing allotment, where the corresponding alternative segment would cross only the Peck SGC allotment. Several special status plant species are considered likely or somewhat likely to occur in both the LRO and/or the corresponding alternative segment. No documented occurrences of special status plants occur in either of these proposed routes. Based on the higher level of impact associated with the Maiden Rock LRO, the segment of Alternatives 2A and 2B that corresponds to this LRO is more favorable to vegetation resources than the LRO.

Mount Haggin. The Mount Haggin LRO is 1.7 miles long, 0.1 mile shorter than the corresponding segment of Alternatives 1B, 2A, 2B, and 2C. The total projected impact to vegetation of this LRO is approximately 26 acres. The corresponding alternative segment is projected to impact roughly the same acreage. The majority of impacts would be to grasslands and sagebrush under either option; however, approximately 1.5 more acres of riparian/wetland habitat would be impacted by the corresponding segment of Alternatives 1B, 2A, 2B, and 2C. No grazing allotments are crossed by either the LRO or the corresponding alternative segments. Several special status plant species are somewhat likely to occur in both the LRO and corresponding alternative segments, but no documented occurrences are located in

either the LRO or the corresponding alternative segments. The Mount Haggin LRO is more favorable to vegetation resources than the mainline link because it would impact slightly less riparian/wetland habitat.

North of Buxton. The North of Buxton LRO is 6.7 miles long and is projected to impact 112 acres of vegetation. The corresponding segment of Alternatives 1B and 2C is roughly 7.2 miles long and would impact an estimated 123 acres. Substantially less riparian/wetland area (approximately 3 acres) would be impacted by the LRO compared to the corresponding alternative segment. The North of Buxton LRO crosses no grazing allotments, whereas the corresponding alternative segment crosses a portion of the Norton (#90412) grazing allotment. Several special status plant species are somewhat likely to occur in both the areas crossed by the LRO and the corresponding alternative segments, but no documented populations are crossed by either the LRO or the corresponding alternative segments. Because of the reduced total impact acreage, as well as the reduced impact to riparian/wetland areas, the North of Buxton LRO would have fewer overall adverse impacts on vegetation than the corresponding segment of Alternatives 1B and 2C.

Radersburg. The Radersburg LRO is roughly 4.8 miles long and is projected to impact 70 acres of vegetation. The corresponding segment of Alternative 1A is 4.3 miles long and is projected to impact 66 acres. Types of vegetative impacts are similar between these two options. Both the LRO and the corresponding segment of Alternative 1A would cross the Frying Pan (#10131), Keating Gulch Common (#20225), and Ralls Mines (#20292) grazing allotments. In addition, the Radersburg LRO would cross the Lower Johnny Gulch (#20291) grazing allotment. Several special status plant species are considered equally likely to occur in both the LRO and corresponding alternative segment; however, no documented occurrences are in either alignment. Both the mainline link and the LRO would have similar overall impacts to vegetation resources.

Rock Creek. If selected, the 4-mile-long Rock Creek LRO would replace a 3.7-mile-long segment of Alternative 2D. Total projected vegetative impacts would be similar, at about 66 acres for the LRO versus 62 acres for the corresponding alternative segment. Types of impacts are also similar, though roughly 6 acres more shrublands would be impacted under the LRO than if the alternative segment were selected. Both options cross two grazing allotments: South Seven Springs (#20362) and Lost Willow (#30364). No special status plant species are documented as occurring under either allotment, but two species are considered equally likely to occur in both alignments. Based on the information presented, the LRO and mainline alternative link would have similar impacts to vegetation resources.

South of Butte 1. The South of Butte 1 LRO is 3.2 miles long and, if selected, would impact approximately 54 acres of vegetation. It would replace a segment of Alternatives 1B, 1C, and 2C, which is 2.5 miles long and would impact approximately 41 acres. A key difference between the two is that the LRO would impact approximately 9 acres more forest than the corresponding alternative segment. No grazing allotments are crossed by either the LRO or the corresponding alternative segment. Two special status plant species are considered equally likely to occur in the LRO area as they are of occurring in the corresponding alternative segment. No special status plant species have been documented as occurring in either alignment. Because the South Butte 1 LRO would impact substantially more vegetation, particularly forest, the corresponding segment of Alternatives 1B, 1C, and 2C would be more favorable from a vegetation viewpoint.

Upper Boulder 1. The Upper Boulder 1 LRO is 13.8 miles long compared to 13.6 miles of the comparable alternative segment of Alternatives 1B and 1D. This LRO would impact a total of 204 acres of vegetation. The majority of this impact is short-/long-term impact caused by construction of the proposed project, which would primarily impact grasslands, with some impacts to the anthropogenic cover type. The corresponding alternative segment would impact roughly 231 acres of vegetation. The main difference between these two routes is permanent impacts to forested areas under the corresponding

alternative segment. The LRO could potentially impact slightly more (0.3 acre) riparian/wetland areas than the corresponding alternative segment. Both routes would cross the same two grazing allotments: Summit (#10282) and Countyline (#20210). No special status plant species have been documented as occurring in either the Upper Boulder 1 LRO or its corresponding alternative segment. One special status species that occurs in the area is equally likely to occur in both routes. Because of the larger impacts associated with the segment of Alternatives 1B and 1D, the Upper Boulder 1 LRO is considered to be more favorable to vegetation.

Upper Boulder 2. The Upper Boulder 2 LRO is 12.3 miles long compared to 11.3 miles of the comparable alternative segment of Alternatives 1B and 1D. This LRO would impact a total of 179 acres of vegetation. The majority of this impact is short-/long-term impact caused by construction of the proposed project, which would primarily impact grasslands, with some impacts to the anthropogenic cover type. The corresponding alternative segment would impact roughly 199 acres of vegetation. The main difference between these two routes is permanent impacts to forested areas under the corresponding alternative segment. The LRO could potentially impact slightly more (0.3 acre) riparian/wetland areas than the corresponding alternative segment. Both routes would cross the same two grazing allotments: Summit (#10282) and Countyline (#20210). No special status plant species have been documented as occurring in either the Upper Boulder 2 LRO or its corresponding alternative segment. One special status species that occurs in the area is equally likely to occur in both routes. Because of the greater impacts associated with the segment of Alternatives 1B and 1D, the Upper Boulder 2 LRO is considered to be more favorable to vegetation.

Willow Creek. The Willow Creek LRO is approximately 1.3 miles long and is projected to impact roughly 20 acres of vegetation. If selected, it would replace a 1.3-mile-long segment of Alternative 2B that is projected to impact 23 acres of vegetation. The types of vegetation impacted are similar between the two alignments. The Willow Creek LRO would cross the Smith Individual SGC (#10346) and the Lost Willow (#30364) grazing allotments, whereas the corresponding segment of Alternative 2B would cross only the Lost Willow allotment. Several special status plant species are somewhat likely to occur in either alignment, though neither alignment has a documented occurrence of a special status plant species. Overall impacts to vegetative resources would be similar for both the LRO and corresponding mainline link.

3.10.7 Climate Change

Climate change, vegetation (i.e., habitat), and wildlife are interrelated. A detailed review of how climate change is likely to affect vegetative resources in the proposed project area is in Section 3.3.4.6. A general trend that can be expected in all ecosystems in the proposed project area is that sensitive or marginal species and communities at the edges of their current ranges and adapted to present conditions may be particularly and severely affected and could be the first to be affected and likely extirpated. For rangeland health, there appears to be a good chance that climate change will cause rangeland health to degrade because of reduced precipitation, losses of native species, and increases in annual bromes.

3.10.8 Mitigation Measures

The following sections describe general mitigation measures, specialized resource-specific mitigation measures, residual impacts, and estimates of projected mitigation costs.

3.10.8.1 Agency Stipulations

Impacts to vegetation resources during construction and operation of the proposed project would be reduced by implementation of the requirements in Appendix B of the USFS *Record of Decision (ROD) for the Designation of Section 368 Energy Corridors on National Forest System Land in 10 Western States* (USFS 2009) and in Appendix B of the BLM *Approved Resource Management Plan Amendments/ROD for Designation of Energy Corridors on Bureau of Land Management Administered Lands in 11 Western States* (BLM 2009) (Appendix B.4). Specific mitigation measures for direct and indirect impacts to vegetation resources are found in both of these documents at B.1-Regulatory Compliance item 3; B.1-Ecological Resources items 1 through 3; B.1-Vegetation Management; B.2-Soils, Excavating, and Blasting items 2, 3, and 6; B.2-Surface and Groundwater Resources item 1; B.2-Ecological Resources items 1 and 2; B.3-Mitigation and Monitoring; B.3-Ecological Resources item 1; and B.3-Pesticide and Herbicide Use item 1. Specifications specific to special status plant species are as follows: B.1-Regulatory Compliance item 3; B.1-Ecological Resources item 1; and B.2-Ecological Resources item 1.

In Montana impacts from the proposed project will also be avoided, minimized, or compensated through the implementation of the MDEQ draft environmental specifications for the project (Appendix B.4). The MDEQ draft specifications that are most relevant to vegetation resources are listed by topic as follows:

Direct and indirect impacts to the environment and vegetation resources will generally be mitigated through adherence to MDEQ specifications 0.2, 0.4, 0.5, 0.7, 0.8, and 1.1.1.

Direct and indirect impacts to vegetation resources caused by transmission line construction or access roads will be mitigated through adherence to MDEQ specifications 2.1.1 through 2.1.6, 2.1.8, 2.2.2, 2.2.3, 2.3.1 to 2.3.3, 2.5.5, 2.7.1 through 2.7.6, 2.8.3 through 2.8.8, 2.9.1 through 2.9.7, 2.9.9, 2.9.12, 2.9.13, 2.11.5, 2.11.7, 2.11.8 through 2.11.12, 2.11.14 through 2.11.16, 2.14.4, 2.14.5, 2.14.11, 2.15.2, 2.15.9, 2.15.10, and 2.15.11.

The MDEQ post-construction cleanup and reclamation specifications that will mitigate for direct and indirect impacts to vegetation resources are 3.1.1, 3.1.2, 3.2.1 through 3.2.5, 3.2.7 through 3.2.10, 3.2.12 to 3.2.14, 3.3.1, and 3.3.3.

Direct and indirect impacts to vegetation resources during the operation and maintenance of the facility will be mitigated through MDEQ specifications 4.1.1 through 4.1.5, 4.2.1 through 4.2.4, and 4.2.6.

The MDEQ specifications specific to noxious weed control and management are 2.8.8, 4.1.1, 4.4.1 through 4.4.4, 4.4.6, and in specifications Appendix F.

The MDEQ specifications specific to livestock are 2.5.4 through 2.5.9.

3.10.8.2 Resource-Specific Mitigation Measures

- VG-1 On federal lands where avoidance of special status plants is not possible, collect seed, transplant individual plants, and salvage topsoil and seedbanks under the direction of an agency botanist.
- VG-2 Restrict timing of construction activities on federal lands to time periods specified by agency botanists to avoid direct impacts to sensitive plant species.
- VG-3 In order to reduce the amount of ground disturbance associated with wire splicing, use implosive splicing techniques outside of residential and subdivided areas during conditions not conducive to fires.

VG-4 Conduct field botanical surveys of likely habitat types to support sensitive plant species during the optimal phenological period for identification as part of the Vegetation Removal and Disposition Plan (MDEQ draft Environmental Specifications - Appendix J). When impacts to sensitive plant occurrences cannot be avoided, implement measure VG-1 regardless of property ownership.

3.10.8.3 Compensatory Mitigation Measures

Generally, compensatory mitigation could be required for impacts to sage-grouse habitat, riparian/wetland areas, and special status plant species. Compensatory mitigation measures for sage-grouse habitat are described in Section 3.3; measures for riparian/wetland areas are described in Section 3.12.

Compensatory mitigation for special status plant species could be required if a population (or individual) cannot be avoided. Compensatory mitigation for special status plant species could involve seed collection, the relocation of the population to an offsite location deemed appropriate by an agency specialist, or other similar measures. The current level of design and knowledge of undocumented special status plant populations is not yet complete to determine whether or where this type of mitigation would be necessary.

3.10.8.4 Mitigation Costs

The per-acre mitigation cost estimates shown in Table 3.10-16 are a requirement of MFSA and MEPA and were developed to aid the MDEQ in its analysis of alternatives. These costs should be considered estimates and are intended to be used only in the context of the proposed project and solely for approximate cost comparisons among the alternatives and LROs. Riparian/wetland compensatory mitigation is discussed in Section 3.12. Soil ripping to a depth of 12 inches is included because there will be areas (e.g., overland routes) where soil compaction would likely be very high and this treatment would be needed; however, soil ripping would not be necessary at many locations.

Table 3.10-16. Estimates of Upland Reclamation Costs for the Proposed Project

Uplands Average (Per Acre)	Cost Estimate (\$)	Number of Years	Total (\$)
Ripping to a depth of 12 inches	1,300 ¹	1	1,300
Design and recontouring/regrading	2,250 ²	1	2,250
Upland seeding	350 ³	1	350
Weed management	70 ⁴ /year	50	7,900

1 RSMears 2003.

2 Personal communication, May 2009: Robert Secor, Secor Excavation, Inc., Bozeman, Montana. Estimate includes use of three types of heavy equipment (ranging from \$110 to \$300 per hour) and up to 8 hours to recontour and lay 6 inches of topsoil; hours will vary depending on soil conditions (rock content) and topography. Total cost also includes estimates for mobilization, fuel (\$2.28 per gallon), permitting, bonding, and per diem.

3 Circle S Seeds, Three Forks, Montana; price will vary as a result of native species used and species availability. Seed may need to be added each year to compensate for poor germination rates as a result of climate, animal consumption, or other environmental stressors; this cost is incorporated into the estimate. Estimate also includes labor for seed application. Personal communication, May 2009: Dymamecc Property Services, Bozeman, Montana.

4 Personal communication. Dymamecc Property Services, Bozeman, Montana. May 2009. Costs were inflated at an annual rate of 3 percent from 2009 to 2059 (e.g., lifespan of the project).

3.10.9 Residual Impacts

Residual impacts, also referred to as permanent impacts, are those that would remain after implementation of mitigation measures and persist for the life of the proposed project. While new or enlargement of

existing noxious weed and cheatgrass infestations would likely be residual impacts, they are not included in this discussion because the extent of their impact is greatly dependent on future, unquantified, and unquantifiable actions. Of the estimated 6,000 to 8,000 acres of total projected impact in the proposed project area (Table 3.10-5), the estimated residual impact ranges from approximately 1,550 to more than 3,000 acres for the entire alignment from end to end (Tables 3.10-6 and 3.10-7). The actual level of residual impact would depend on the routes selected and the methods used to access and construct the proposed transmission line.

Cost for mitigation would be directly proportional to the length of the alternatives. The range of mitigation costs for alternatives ranges from a low of \$2.5 million dollars for Alternative 4A (the shortest) to \$15.1 million for Alternative 5C (the longest) (Table 3.10-17). Costs for LROs range from about \$70,000 to more than \$600,000.

Table 3.10-17. Estimates of Upland Mitigation Costs by Alternative and Local Routing Option*

Alternative/ LRO	Miles of Transmission Line	Short-/Long- Term Impact (Acres)	Estimated Costs (Rounded to Nearest \$1,000)					Est. Total Cost	Cost/Mile of Trans. Line
			Site Ripping	Design/ Recontouring	Seeding	Weed Management			
Zone 1									
1A	81.8	549	714,000	1,235,000	192,000	4,337,000	6,478,000	79,000	
1B	90.2	848	1,102,000	1,908,000	297,000	6,698,000	10,005,000	111,000	
1C	94.9	1,009	1,312,000	2,270,000	353,000	7,972,000	11,907,000	125,000	
1D	54	537	699,000	1,209,000	188,000	4,245,000	6,341,000	117,000	
Zone 2									
2A	57.5	571	742,000	1,284,000	200,000	4,508,000	6,734,000	117,000	
2B	57.2	572	744,000	1,288,000	200,000	4,521,000	6,753,000	118,000	
2C	89.7	833	1,083,000	1,874,000	291,000	6,578,000	9,826,000	109,000	
2D	63.5	567	738,000	1,277,000	199,000	4,483,000	6,697,000	105,000	
2E	53.5	522	679,000	1,174,000	183,000	4,124,000	6,160,000	115,000	
Zone 3									
3A	72.2	762	990,000	1,714,000	267,000	6,019,000	8,990,000	124,000	
3B	67.2	710	923,000	1,598,000	249,000	5,610,000	8,380,000	125,000	
3C	72	751	976,000	1,690,000	263,000	5,934,000	8,863,000	123,000	
Zone 4									
4A	20	217	282,000	489,000	76,000	1,716,000	2,563,000	128,000	
Zone 5									
5A	107.4	1,143	1,485,000	2,571,000	400,000	9,026,000	13,482,000	126,000	
5B	114	1,207	1,569,000	2,716,000	423,000	9,537,000	14,245,000	125,000	
5C	117.5	1,280	1,664,000	2,880,000	448,000	10,113,000	15,105,000	129,000	
5D	111.3	1,211	1,574,000	2,725,000	424,000	9,567,000	14,290,000	128,000	

Table 3.10-17. Estimates of Upland Mitigation Costs by Alternative and Local Routing Option*

Alternative/ LRO	Miles of Transmission Line	Short-/Long- Term Impact (Acres)	Estimated Costs (Rounded to Nearest \$1,000)					Est. Total Cost	Cost/Mile of Trans. Line
			Site Ripping	Design/ Recontouring	Seeding	Weed Management			
Zone 6									
6A	104.5	1,172	1,523,000	2,637,000	410,000	9,257,000	13,827,000	132,000	
LRO									
Beef Trail	2.7	27	36,000	62,000	10,000	216,000	324,000	120,000	
Boulder Hill	4.1	39	50,000	87,000	14,000	14,000	165,000	112,000	
Clark Canyon East	7.8	77	100,000	173,000	27,000	27,000	327,000	116,000	
Diamond Butte	4.7	48	63,000	108,000	17,000	17,000	205,000	120,000	
Fleecer	3.2	32	42,000	73,000	11,000	11,000	137,000	120,000	
Frying Pan Gulch	4.8	49	64,000	110,000	17,000	17,000	208,000	120,000	
Lima	13.5	142	185,000	320,000	50,000	50,000	605,000	124,000	
Lower Boulder	11.3	110	143,000	248,000	39,000	39,000	469,000	115,000	
Maiden Rock	5	50	65,000	113,000	18,000	18,000	214,000	119,000	
Mount Haggin	1.7	17	22,000	37,000	6,000	6,000	71,000	117,000	
North of Buxton	6.7	60	78,000	135,000	21,000	21,000	255,000	106,000	
Crossover	6.1	62	80,000	139,000	22,000	22,000	263,000	120,000	
Radersburg	4.8	48	62,000	107,000	17,000	17,000	203,000	118,000	
Rock Creek	4	40	52,000	91,000	14,000	14,000	171,000	119,000	
South of Butte 1	3.2	32	42,000	72,000	11,000	11,000	136,000	118,000	

Table 3.10-17. Estimates of Upland Mitigation Costs by Alternative and Local Routing Option*

Alternative/ LRO	Miles of Transmission Line	Short-/Long- Term Impact (Acres)	Estimated Costs (Rounded to Nearest \$1,000)				Est. Total Cost	Cost/Mile of Trans. Line
			Site Ripping	Design/ Recontouring	Seeding	Weed Management		
South Pioneers	8.1	84	109,000	189,000	29,000	29,000	356,000	122,000
Upper Boulder 1	13.8	141	183,000	317,000	49,000	49,000	598,000	121,000
Upper Boulder 2	12.3	126	164,000	284,000	44,000	44,000	536,000	121,000
Willow Creek	1.3	13	18,000	30,000	5,000	5,000	58,000	120,000

* Cost estimates are approximate and are intended for comparison among alternatives with a zone. Actual costs for upland mitigation may vary significantly from those shown.