

3.6 VEGETATION COMMUNITIES

This section addresses potential impacts to vegetation communities from the Preferred Route, Proposed Route, and Route Alternatives, during both construction and operations.

The BLM's Preferred Routes for each segment of the Project are listed below. Where applicable, the preferred route identified by another federal agency or a county or state government is also noted.

- **Segment 1W:** The BLM's Preferred Route is the Proposed Route (Figure A-2). This route is also the State of Wyoming's preferred route.
- **Segment 2:** The BLM's Preferred Route is the Proposed Route (Figure A-3). This route is also the State of Wyoming's preferred route.
- **Segment 3:** The BLM's Preferred Route is the Proposed Route, including 3A (Figure A-4). This route is also the State of Wyoming's preferred route.
- **Segment 4:** The BLM's Preferred Route is the Proposed Route (Figures A-5 and A-6) except within the Caribou-Targhee NF. The portion of this route in Wyoming is also the State of Wyoming's preferred route. The Forest Service's preferred route is the Proposed Route within the NF incorporating Alternative 4G (Figure A-6).
- **Segment 5:** The BLM's Preferred Route is the Proposed Route incorporating Alternatives 5B and 5E, assuming that WECC reliability issues associated with 5E are resolved (Figure A-7). Power County's preferred route is the Proposed Route incorporating Alternatives 5C and 5E (Figure A-7).
- **Segment 6:** The BLM's Preferred Route is the proposal to upgrade the line voltage from 345 kV to 500 kV (Figure A-8).
- **Segment 7:** The BLM's Preferred Route is the Proposed Route incorporating Alternatives 7B, 7C, 7D, and 7G (Figure A-9). The Proposed Route in the East Hills and Alternative 7G will be microsited to avoid sage-grouse PPH. Power and Cassia Counties' preferred route is Alternative 7K (Figure A-9).
- **Segment 8:** The BLM's Preferred Route is the Proposed Route incorporating Alternative 8B (Figure A-10). This is also IDANG's preferred route.
- **Segment 9:** The BLM's Preferred Route is the Proposed Route incorporating Alternative 9E, which was revised to avoid PPH and the community of Murphy (Figure A-11). Owyhee County's preferred route is Alternative 9D (Figure A-11).
- **Segment 10:** The BLM's Preferred Route is the Proposed Route (Figure A-12).

3.6.1 Affected Environment

The Project crosses two major ecological zones. Proceeding from east to west, the ecological zones are the Temperate Steppe which grades into the Temperate Mountain System as the route proceeds west across the Continental Divide (Space 2000). The route crosses seven ecoregions (Chapman et al. 2004, McGrath et al. 2002). It starts in the east in the Northwestern Great Plains Ecoregion, then crosses the Southern Rockies and Wyoming Basin Ecoregions before entering Idaho. There it crests the

Wasatch and Uinta Mountains Ecoregion and Middle Rockies Ecoregion before entering the Northern Basin and Range Ecoregion. The westernmost section of the route lies on the Snake River Plain Ecoregion. Nearly two dozen subregions are traversed by the Proposed Route and Route Alternatives.

Due to the length of the Project, nearly all the vegetation communities present in southern Wyoming and Idaho are crossed. These include expanses of semi-arid shrubland and grassland, irrigated agricultural land (principally in the Snake River Plains), forested mountains, shrub and woodland covered hills, and riparian woodlands and wetlands. Vegetation types crossed by the Project are presented in Section 3.6.1.5. Approximately 40 percent of the vegetation crossed by the Proposed Route and Route Alternatives is natural sagebrush (established native sagebrush communities).

Nearly all the vegetation communities present in the Project area have been modified to some degree by human activities, and about one-third has been modified to an extent that it was mapped as either disturbed vegetation or agriculture for the EIS. Principal activities occurring within the Project area include livestock ranching, oil and gas exploration and development, mining, timber harvest, and agricultural development including both dryland farming and irrigated cropland and pastures.

3.6.1.1 Analysis Area

The Analysis Area used to determine vegetation impacts was defined as a buffer of 250 to 500 feet on either side of the Proposed Route and Route Alternatives centerlines (a 500 to 1,000 feet total, hereafter referred to as “buffer”) depending on constraints associated with each route. The Analysis Area also includes a buffer of 13 feet (26 feet total) around the centerline of any access road that extends outside of the buffer area. In addition, the Analysis Area includes vegetative mapping of all ancillary facilities (such as laydown yards, fly yards, and multipurpose yards) that may occur outside the buffer area. These distances were used because they encompass the area of greatest activity during construction and operations, and any Project-related impacts (changes in size or function) to vegetation would occur within these buffers while allowing for minor route alterations during final design. The Analysis Area for vegetation includes a total of approximately 70,040 acres.

3.6.1.2 Issues Related to Vegetation Communities

The following vegetation-related issues were brought up by the public during public scoping (Tetra Tech 2009) and comments in the Draft EIS, were raised by federal and state agencies during scoping and agency discussions, or must be considered as stipulated by law or regulation:

- How much vegetation would be cleared, and how much would be kept clear or otherwise maintained during operations;
- How quickly the various vegetation communities that are cleared for construction but allowed to regrow during operations would recover from disturbance;
- How much disturbance in sagebrush communities would occur and what the effects would be;

- How much disturbance in native grasslands would occur and what the effects would be;
- Whether old-growth forest stands would be affected, and what measures would be taken to protect this vegetation type; and
- What the effects of construction, operations, and maintenance on fire occurrence, frequency, and severity would be, especially as they relate to important shrub-steppe and forest habitats.

Issues related to special status plants, noxious weeds and invasive plants, and wetlands and riparian areas are discussed in Sections 3.7 – Special Status Plants, 3.8 – Invasive Plant Species, and 3.9 – Wetlands and Riparian Areas, respectively. Effects to agricultural lands and timber production on federal lands are addressed in Sections 3.17 – Land Use and Recreation and 3.4 – Socioeconomics, respectively.

3.6.1.3 Regulatory Framework

Federal, state, and local agencies manage vegetation for wildlife habitat, public use, watershed protection, livestock forage, and other uses under the authority of various laws, including the Taylor Grazing Act of 1934 as amended, the Federal Land Management and Policy Act of 1976, the Sikes Act, NEPA, the SRBOP, as well as the BLM and Forest Service policies and manuals including BLM rangeland standards and guidelines, Forest Plans and RMPs. In addition, there are laws and regulations for sensitive plant species, and some sensitive vegetative communities (such as wetlands). Laws and regulations related to specific sensitive plant species or communities are discussed in Section 3.7 – Special Status Plants, Section 3.8 – Invasive Plant Species, and Section 3.9 – Wetlands and Riparian Areas.

3.6.1.4 Methods

The primary source of information used for analysis of impacts to vegetation was a detailed remote sensing-based vegetation mapping study conducted specifically for this Project. In addition, information on general vegetation characteristics was obtained from BLM RMPs and Forest Service Forest Plans, other agency publications and databases, published scientific literature, and limited field surveys. The goal of the mapping effort was to identify vegetation types using a combination of GIS-assisted segmentation, aerial imagery interpretation, and limited ground surveys. Details of this vegetation/habitat mapping effort are presented in the *Vegetation and Habitat Baseline Technical Report* (Tetra Tech 2010a). Vegetation typing and GIS modeling were used to identify habitats for several wildlife species (see Section 3.11 – Special Status Wildlife and Fish). Below is a summary of the steps used during this mapping effort:

- Digital ortho quarter quad tiles of the Project were downloaded from the USDA Farm Service Agency's National Agriculture Imagery Program (NAIP). This program acquires 1-meter resolution digital ortho-imagery for agricultural regions in the United States during the summer crop growing season. The program updates their datasets annually by rotating among states or over regions within larger states; therefore, only a portion of the United States is flown each year. NAIP imagery is acquired at a 1-meter ground sample distance with a horizontal accuracy that matches within 6 meters of reference aerial control points, which are used during image inspection. The latest imagery available for Idaho had

been flown in 2004 and for Wyoming in 2006. This imagery was used for the purposes of initial segmentation.

- Field reconnaissance indicated that relatively small changes had occurred in native vegetation areas subsequent to the acquisition of the aerial imagery described above. To account for these changes, and to capture current vegetation communities, multi-spectral digital aerial imagery with 1-foot resolution was acquired specifically for this Project. Data collection was conducted in three phases. The first two phases were planned to coincide with early spring growth across the Analysis Area. Phase one included the Snake River Plain in Idaho (flown April 28 to May 5, 2008), central and southwest Wyoming (flown June 3 to 15, 2008), and the mountainous areas of southeastern Idaho and southwestern Wyoming (flown July 7 to 11, 2008). Phase two included southern Idaho and southwestern Wyoming (flown September 25 to 28, 2008). The last phase was flown in response to changes in the Proposed Route and Route Alternatives. Phase three included the mountains of southeastern Idaho and southwestern Wyoming (flown October 22 to 24, 2008). A few Project elements were not covered during these Project-specific surveys. Vegetation types in these areas were identified using the NAIP imagery described above.
- A GIS program (SPRING 5.0) was used to segment the NAIP imagery into polygons representing distinct vegetation stands. The initial minimum mapping unit was 0.1 acre and the average polygon size after segmentation was 4.6 acres. Oversegmentation (i.e., when resulting polygons of like pixels were too small or too fragmented) was corrected by using Environmental Systems Research Institute (ESRI) ArcInfo[®] program. This resulted in a minimum mapping unit of 5 acres, which more accurately and consistently identified vegetation types.
- The resultant polygon layer was overlaid on the Project-specific imagery.
- A team of biologists assigned names to each polygon using National Vegetation Classification System (NVCS) vegetation alliances and associations. The NVCS is a hierarchical classification system (Grossman et al. 1998) that defines vegetation associations by species composition, uniform habitat conditions, and uniform physiognomy (i.e., the general characteristic of the landscape such as shrub-steppe or mixed conifer). Biologists also used data obtained from the Landscape Fire and Resource Management Planning Tools Project LANDFIRE vegetation classification (available Project-wide) as reference or comparison layers (USGS 2006). In the summer of 2009, a similar mapping effort was undertaken to incorporate changes to the Proposed Route and Route Alternatives, following the methodology described above.
- Field sampling was conducted from April through December 2008 and in September and October 2009 to collect quality assessment data (i.e., data to verify mapped vegetation). In the field, transects were run to collect vegetation data at targeted locations for assessment of the accuracy of vegetation interpretation. This accounted for the original Proposed Route and Route Alternatives, as well as modifications made to the Proposed Route and new Route Alternatives developed in 2009.

- The remote sensing imagery segmentation and interpretation resulted in the identification of 77 vegetation alliances, including 25 shrubland alliances, 18 forest or woodland alliances, 9 developed or disturbed alliances (commercial, CAFO, extractive, recreation, residential, urban, residential, ROW, “other”; unseeded fields used for agriculture or grazing), 4 herbaceous or grassland alliances, 6 agricultural alliances, 5 general wetland or riparian alliances, 4 water types, and 6 other cover types (e.g., rock outcrop and scree). For the EIS analysis, the vegetation alliances were aggregated into general vegetation types. By combining alliances with similar dominants, 11 upland vegetation types (including disturbed shrubland and grassland types), and 1 wetland/riparian vegetation type were identified. In addition, 4 other cover types were identified: agriculture, open water, miscellaneous, and disturbed/developed (see Table 3.6-1 for a description of each).
- For the more detailed wetland analysis, where impacts to specific wetland types must be addressed, wetlands/riparian areas were analyzed in greater detail using aerial photo interpretation of Project-specific imagery and NAIP photography, as well as some field validation. In the summer of 2009, site visits were conducted at 79 locations to verify mapped wetland and riparian features. Wetlands and riparian vegetation were mapped in eight categories (e.g., forest, shrub, herbaceous) and the results were combined with the other vegetation associations in the GIS database (see Section 3.9 – Wetlands and Riparian Areas).
- The results of the vegetation type analyses were incorporated onto maps containing the Proposed Route and Route Alternatives. A quantitative assessment of impacts was then developed with an additional GIS analysis, by overlaying the vegetation type polygons with the footprint of the Project (based on the Project’s preliminary engineering design). The acreage of impacts to vegetation types was determined for both the construction and operations phases of this Project. Construction impacts include all areas that would be disturbed during construction. Operations impacts include all areas that would either be permanently disturbed due to Project facilities (roads, transmission structures, etc.) or where disturbance would continue due to Project maintenance. All of the operations impacts would be initiated during construction; therefore, values reported for operations impacts are a subset of the construction disturbances. Analysis of ROW clearing and maintenance impact was assessed by GIS by overlaying the vegetation with the ROW width. Disturbance estimates are conservative in that they do not take into account the beneficial effects of avoidance and minimization measures.
- The disturbance footprint necessary to construct transmission structure pads and access roads is larger during construction compared to the permanent footprint of these same transmission structure pads and access roads during operations. However, in some instances, the values reported for ROW maintenance for operations may be larger than ROW clearing for construction (e.g., see Tables D.6-2 and D.6-3). Clearing for some project facilities during construction (e.g., fly yards) may overlap some portions of the permanent ROW, but as they are cleared for project facilities during construction, they are counted towards

“Construction Facilities” rather than “ROW Clearing.” Therefore, a portion of the acres cleared for facilities may be later classified as ROW maintenance disturbances during operations if they occurred within the forested ROW. As a result, the areas classified as “ROW Clearing” can be smaller during construction than during operations. For example, the total area disturbed during construction and operations is identical within this hypothetical forested area; however, the area that would be classified as ROW clearing is smaller during construction than the ROW maintenance during operations.

- Vegetation data used in the analysis are static as of 2008. Recently, there have been multiple large fires in the vicinity of the Project. As a result, the vegetation information used in the analysis may be outdated in some areas. To identify the potential changes in existing vegetation, GIS databases of wild fires from Idaho and Wyoming were searched. Polygons of fires were overlaid with the analysis area to calculate acres of fires affecting the analysis area by segment. The results of this analysis are included in Table D.6-7 in Appendix D, identifying the name and date of each fire, the total acres or estimated acres of the fire, and the acres of the analysis area disturbed by the fire by segment and alternative.

3.6.1.5 Existing Conditions

The Proposed Route and its Route Alternatives collectively span nearly a thousand miles from 41.6° to 43.4°N latitude and 105.7° to 116.6°W longitude. Elevation, slope, aspect, seasonal temperatures, and annual precipitation exhibit a wide range across the Project area and ultimately support a diversity of ecological units defined by the composition of vegetation.

Table 3.6-1 presents the vegetation types used in this analysis, as well as the sub-communities and species found within each vegetation type. Table D.6-1 in Appendix D presents the number of miles of each vegetation type crossed by the Proposed Route and its Alternatives.

Table 3.6-1. Vegetation Types in Gateway West Analysis Area

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities ^{1/}	Common Species
Shrubland Natural/Semi-Natural Vegetation				
Sagebrush	All	40.3	Big sagebrush shrubland, big sagebrush shrub herbaceous, mountain big sagebrush shrubland herbaceous, mountain big sagebrush shrubland, Wyoming big sagebrush shrubland, black sagebrush shrubland, low sagebrush shrubland, silver sagebrush shrubland herbaceous	Shrubs: Basin big sagebrush, Wyoming big sagebrush, mountain sagebrush, rubber rabbitbrush, shadscale, green rabbitbrush, antelope bitterbrush, black greasewood, fourwing saltbush Grasses: bluebunch wheatgrass, Sandberg bluegrass, needle-and-thread, Thurber’s needlegrass, squirreltail, western wheatgrass, Idaho fescue, Indian ricegrass Non-native: cheatgrass

Table 3.6-1. Vegetation Types in Gateway West Analysis Area (continued)

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities ^{1/}	Common Species
Disturbed Sagebrush	All except 6	12.9	Disturbed Wyoming big sagebrush, Basin big sagebrush	Shrubs: Wyoming big sagebrush, Basin big sagebrush, rubber rabbitbrush Grasses: Sandberg bluegrass Non-native: cheatgrass, crested wheatgrass, other species present within big sagebrush and disturbed grassland types
Greasewood	1W, 2, 3, 4, 7, 8, 9	2.5	Black greasewood shrubland	Shrubs: black greasewood, rubber rabbitbrush, Torrey seablite, shadscale, fourwing saltbush, Gardner saltbush, bud sagebrush Grasses: western wheatgrass, blue grama Non-native: cheatgrass, Japanese brome, sixweeks fescue, tansy mustard, Russian thistle, desert alyssum, halogeton, povertyweed
Saltbush	1W, 2, 3, 4, 7, 8, 9	3.2	Fourwing saltbush shrubland, shadscale saltbush shrubland, spiny hopsage shrubland	Shrubs: fourwing saltbush, shadscale saltbush, spiny hopsage, winterfat, bud sagebrush, black greasewood, rubber rabbitbrush, winterfat, big sagebrush, black sagebrush Grasses: Indian ricegrass, bluebunch wheatgrass, needle-and-thread
Dwarf Shrub	1W, 2, 3, 4, 9	2.6	Dwarf shrubland	Shrubs: little sagebrush, Gardner saltbush, winterfat Grasses: Indian ricegrass, Sandberg bluegrass, western wheatgrass
Other Shrub	1W, 4, 5, 7	0.3	Saskatoon serviceberry shrubland, curleaf mountain mahogany shrubland and woodland, alder leaf mountain mahogany shrubland, yellow rabbitbrush shrubland, chokecherry shrubland, antelope bitterbrush shrubland	Shrubs: curleaf mountain mahogany, Saskatoon serviceberry, mountain mahogany, chokecherry, yellow rabbitbrush, western snowberry Grasses: western wheatgrass, needle and thread
Grassland				
Disturbed Grassland	All	15.9	Disturbed grassland	Native grass: western wheatgrass, needle-and-thread, purple three-awn, Sandberg bluegrass Non-native: crested wheatgrass, annual brome grasses, intermediate wheatgrass, smooth brome, cheatgrass, and others
Native Grass	1W, 4, 5, 7, 8, 9	0.4	Streambank wheatgrass-prairie junegrass herbaceous, bluebunch wheatgrass herbaceous	Grasses and grass-like species: streambank wheatgrass, Sandberg bluegrass, bluebunch wheatgrass, needle-and-thread, prairie junegrass, red threeawn, streamside wild rye, western wheatgrass, smallwing sedge, rushes Shrubs: rubber rabbitbrush, green rabbitbrush, big sagebrush Non-native: cheatgrass, alyssum, salsify

Table 3.6-1. Vegetation Types in Gateway West Analysis Area (continued)

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities ^{1/}	Common Species
Forest and Woodland				
Conifer Forest	1W, 4, 5, 7	1.3	Douglas-fir forest and woodland, subalpine fir-aspen forest, lodgepole pine forest, limber pine-aspen forest, ponderosa pine forest and woodland, ponderosa pine-aspen forest, upper treeline whitebark and limber pine	Trees: lodgepole pine, Douglas-fir, limber pine, bigtooth maple, aspen Shrubs: Saskatoon serviceberry, chokecherry, Scouler willow, Rocky Mountain juniper, creeping barberry, gooseberry/ currant
Deciduous Forest	1W, 4, 5, 7	1.7	Bigtooth maple montane forest, Aspen – Douglas-fir forest, aspen forest, aspen woodland,	Trees: aspen, bigtooth maple, Douglas-fir Shrubs: chokecherry, mountain snowberry, common juniper, Saskatoon serviceberry, big sagebrush, gooseberry/currant, Woods rose Grasses and grass-like species: pinegrass, elk sedge, mountain brome
Juniper	1W, 2, 4, 5, 7, 9	1.9	Western juniper woodland, Utah juniper woodland, Rocky Mountain juniper woodland	Trees: Utah juniper, Rocky Mountain juniper, western juniper Shrubs: big sagebrush, black sagebrush, fourwing saltbush, shadscale, green rabbitbrush, ephedra, rubber rabbitbrush, broom snakeweed, serviceberry, fringed sage, prickly pear, bitterbrush snowberry Grasses and grass-like species: Indian ricegrass, squirreltail, needle and thread, western wheatgrass, bluebunch wheatgrass, galleta, Sandberg bluegrass, blue grama, junegrass, muttongrass, sedges
Wetland and Riparian	All except 6	1.1	Forested riparian, forested wetland, shrub riparian, shrub wetland, herbaceous wetland, mixed wetland, mixed riparian	Herbaceous emergents: common reed, cattail, bulrush, woolly sedge, Nebraska sedge, creeping spikerush, clustered field sedge, Baltic rush, saltgrass. Shrubs and trees: coyote willow, yellow willow, Woods rose, common chokecherry, black hawthorn, red-osier dogwood, water birch, narrowleaf cottonwood, black cottonwood, peachleaf willow Non-native: Russian olive
Other Cover Types				
Miscellaneous (substrate-dominated)	1W, 2, 4, 5, 7, 8, 9, 10	0.2	Inter-Mountain Basins Cliff and Canyon, Inter-Mountain Basins Volcanic Rock and Cinder Land, Large Eroding Bluffs Sparsely Vegetated, Rock Outcrop Sparsely Vegetated, scree, badlands	Ponderosa pine, lodgepole pine, Indian ricegrass, big sagebrush, sand sagebrush, fourwing saltbush, others
Water	All	0.2	Lake, pond, playa, reservoir, river/stream/ canal	Aquatic plants may be present
Agriculture	1W, 4, 5, 7, 8, 9, 10	12.7	Dryland farming, fallow/hay pasture, herbaceous pasture, irrigated farming, orchard, shrub pasture	Crops, non-native grasses and forbs, weeds, shrubs

Table 3.6-1. Vegetation Types in Gateway West Analysis Area (continued)

Vegetation Type	Segment	Percent of Analysis Area	Sub-Communities ^{1/}	Common Species
Disturbed/ Developed (unvegetated by human disturbance)	All	1.8	Barren, burned, commercial, disturbed, extractive, recreation area, residential, ROW, urban	Much of this cover is unvegetated, other parts have landscaped or weedy vegetation, few native species

1/ "Shrubland herbaceous" communities are those with a moderate to dense herbaceous layer; "shrubland" communities without this designation are typically characterized by a sparse herbaceous layer.

Scientific names of plants are provided in Tetra Tech (2010a).

Source: Tetra Tech 2010a; Jankovsky-Jones 2001

Shrubland

Shrubland is the most common vegetation type found within the Analysis Area. It is the dominant type throughout the Wyoming portions of the Analysis Area and is common within Idaho. Major shrub types include sagebrush, disturbed sagebrush, saltbush, and greasewood.

The sagebrush type is the most widely distributed type of shrubland, occurring on the plains, intermountain basins, and slopes. It occurs in all segments and makes up more than 40 percent of the Analysis Area for all proposed segments. This vegetation type has an overstory of sagebrush and a variable understory of species of grass, forbs, and sub-shrubs. This vegetation type includes eight sagebrush associations that were identified during mapping.

Disturbed sagebrush vegetation is found in the Analysis Area of all segments except 6 and is most common in Segments 8 and 9. It includes many of the plant associations of the Wyoming big sagebrush shrubland alliance, some of which are of poorer quality due to recent disturbance.

The greasewood type is most common in Segments 2, 3, and 4 in Wyoming, but also occurs in Segments 1W, 7, 8, and 9. This vegetation type includes one association.

The saltbush type occurs along Segments 1W, 2, 3, 4, 7, 8, and 9. It includes three associations. This is the most arid vegetation type within the Analysis Area, occurring in areas with 8 to 10 inches of annual rainfall.

Dwarf shrub consists of arid areas dominated by dwarf shrubs less than one foot in height. Common dominants include sagebrush, Gardner saltbush, and winterfat. This vegetation type occurs on Segments 1W, 2, 3, 4, and 9.

Other shrub communities occur in the mountainous portions of the Analysis Area in Segments 1W, 4, 5, and 7, but occupy only small areas. The most common types are dominated by mountain mahogany.

Grasslands

Grasslands occur on all segments but are especially abundant on Segments 8 and 9. Nearly all of the grasslands are disturbed or semi-natural plant communities dominated by non-native perennial grass species including crested wheatgrass and intermediate wheatgrass, and weeds such as cheatgrass. The crested wheatgrass and intermediate wheatgrass stands typically result from revegetation or seeding, while dominance by

cheatgrass is a result of disturbance and wildfire and therefore have different management considerations. Some disturbed grasslands are dominated by early seral native grass species such as purple threeawn, and Sandberg bluegrass.

Native grassland occurs on Segments 1W, 4, 5, 7, 8, and 9. Most of the native grassland is in the bluebunch wheatgrass association.

Forest and Woodland

Forests are limited in extent and primarily occur in Segments 1W, 4, 5, and 7 where the Proposed Route and Alternatives cross areas of higher elevation in the Laramie Mountains, the Tump Range, and Commissary Ridge of Wyoming and the Wasatch Range, Portneuf Range, Deep Creek, and Sublette Mountains in Idaho (Appendix E, Figures E.10-1 and E.10-2). Seven deciduous and seven conifer forest and woodland associations were mapped. Deciduous forests occupy less than 2 percent of the Analysis Area along Segments 1W, 4, 5, and 7. Most of the deciduous forest is dominated by aspen; other species include bigtooth maple, Douglas-fir, and other conifers. Conifer forests occupied less than 2 percent of the Analysis Area for Segments 1W, 4, 5, and 7. They are dominated by Douglas-fir, ponderosa pine, and lodgepole pine. The Draft EIS identified areas along the Segment 4 Proposed Route when whitebark pine (a species recently added to the Wyoming BLM sensitive species list) and limber pine (a Wyoming BLM sensitive species difficult to distinguish from whitebark pine) were known to occur. Subsequent route modifications now avoid the ranges of these species and they are not addressed further here.

Juniper woodlands occur within the Analysis Area in both Idaho and Wyoming, and are most prevalent along Segments 5, and 7, where they occupy about less than 2 percent of the Analysis Area. They also occur in Segments and 1W, 2, 4, and 9. Most of the juniper woodlands are dominated by Utah juniper in Idaho and Rocky Mountain juniper in Wyoming.

Wetland and Riparian Types

Wetlands and riparian vegetation occupy approximately 1 percent of the Analysis Area for all Segments except 6. The most common type is herbaceous wetland, but shrub and forested wetlands and riparian areas are also present. Wetlands and riparian areas are discussed in more detail in Section 3.9 – Wetlands.

Other Cover Types

Several substrate-dominated natural communities are included under miscellaneous in Table 3.6-1, including cliffs and canyons, sand dunes, and volcanic rocks. Cliffs and canyons are present near Segments 1W, 4, and 9. There are no sand dunes present in the Analysis Area. Volcanic rock and cinder occur near several segments, but mostly in Segments 4 and 9.

Other cover types include open water, disturbed/developed areas, and agricultural lands (irrigated and unirrigated). Disturbed/developed areas cover less than 2 percent of all segments. Agricultural lands represent approximately 13 percent of the Analysis Area, mostly in Idaho.

Vegetation Types of Concern

Vegetation types of concern are those that have been identified by land management agencies or by legal requirement because they are uncommon or underprotected. Many of these vegetation types provide habitat for special status plant and animal species. Vegetation types of concern include wetlands and riparian areas (discussed in detail within Section 3.9 – Wetlands and Riparian Areas), cushion plant communities in Wyoming, limber pine in Wyoming, sand dunes, old-growth forests on NFS lands, and intact sagebrush communities in Idaho. There are no sand dunes or cushion plant communities in the Analysis Area; therefore, they will not be addressed further here. Effects to intact sagebrush communities and old-growth forests are discussed in subsection 3.6.2.2 below.

3.6.2 Direct and Indirect Effects

This section is organized to present effects to vegetation from construction, operations, and decommissioning of the proposed Project. Route Alternatives are analyzed in detail below in Section 3.6.2.3.

EPMs are presented in detail within this section only if it is the first time they have been discussed in Chapter 3; all other measures are referenced or summarized. A comprehensive list of all EPMS, and the land ownership to which they apply, can be found in Table 2.7-1 of Chapter 2.

3.6.2.1 No Action Alternative

Under the No Action Alternative, the BLM would not issue a ROW grant to the Proponents of Gateway West and the Project would not be constructed across federal lands. No land management plans would be amended to allow for the construction of this Project. No Project-related impacts to vegetation communities would occur; however, impacts would continue as a result of natural events (such as fire, drought, and severe weather) as well as from existing and planned developments within the Analysis Area and from other projects, including wind farms, mining, agricultural, or other competing land uses. The demand for electricity, especially for renewable energy, would continue to grow in the Proponents' service territories. If the No Action Alternative is implemented, the demand for transmission services, as described in Section 1.3, Proponents' Objectives for the Project, would not be met with this Project and the area would have to turn to other proposals to meet the transmission demand. Under the No Action Alternative, impacts similar to those described below may occur due to new transmission lines built to meet the increasing demand in place of this Project.

3.6.2.2 Effects Common to All Action Alternatives

Construction

The proposed Project would directly affect vegetation communities through the temporary trampling of herbaceous vegetation, the partial removal of aboveground plant cover, and the complete removal of vegetation in places due to construction of the transmission line structures, access roads, temporary work spaces, and other project facilities. Vegetation removal can have a variety of effects on vegetation communities ranging from changes in community structure and composition to alteration of soil moisture or nutrient regimes. The degree of impact depends on the type and amount of vegetation affected, and the

rate at which vegetation would regenerate after construction. Ultimately, these direct and indirect effects can reduce or change the functional qualities of vegetation including wildlife habitat (described in Section 3.10 – General Wildlife and Fish) and livestock forage (grazing impacts are discussed in Section 3.18 – Agriculture). To put Project-related disturbance in context, on a landscape scale, the total removal or alteration of vegetation under the Proposed Action during construction would comprise a small proportion of the total acres of vegetation mapped within the Analysis Area: 5.3 percent of shrubland, 12.5 percent of forest/woodland, 3.3 percent of wetland/riparian, 6.0 percent of grassland, and 5.6 percent of other cover types.

Direct and Indirect Effects on Vegetation Communities

Overstory vegetation, whether in a forest or shrubland community, physically protects understory plants, stabilizes the soil, and provides vertical structure adding diversity to the plant community. Removal of this vegetation shifts the community into an earlier successional stage, changing both its structure (reducing vertical structure) as well as the dominant species. Removal of mature forest by the Project would result in conversion to a younger, less complex forest (i.e., fewer canopy levels). Additionally, tree clearing opens the forest canopy, creating growing conditions that favor shade-intolerant species. The presence of a mature forest canopy also influences microclimate conditions such as soil moisture and temperature, which can be altered when overstory shading is reduced.

Sagebrush vegetation, due to its deep taproot and shallow, diffuse root system also provides an important function in soil moisture and nutrient regime; therefore, the removal of this vegetation alters the soil moisture content and nutrient availability for surrounding plants. The characteristic tap root and shallow, diffuse root system of sagebrush species brings deep soil moisture to the surface, facilitating nutrient uptake and microbial activity and providing normally unavailable moisture to neighboring plants (Caldwell and Richards 1989 as cited in MFWP 2010). The root system also adds to the soil organic material, developing both the shallow and deep soil profiles (Daubenmire 1970 as cited in MFWP 2010). For these reasons, mature sagebrush are often associated with well-developed grass and forb understories, particularly in areas with proper grazing management practices. Thus, the removal of sagebrush and shrubland vegetation by the Project may alter growing conditions for other plants.

Indirectly, vegetation removal can increase the potential for invasive plants and the introduction and spread of noxious weeds (Levine et al. 2003; addressed in detail in Section 3.8 – Invasive Plant Species). Non-native plant invasions have the potential to change the composition and diversity of native plants through competition, by altering the natural fire regime, and by altering other ecosystem processes (e.g., nitrogen cycling). Non-native plants such as cheatgrass create a more continuous fuel bed than their native bunchgrass counterparts, resulting in a dramatic increase in fire frequency and intensity. This has resulted in a substantial loss of native shrubland and grasslands throughout the western United States (Levine et al. 2002). The Project would incorporate standard best management practices (BMPs) and proposed EPMS (described below) for minimizing the potential for introduction and spread of noxious weeds (see additional discussion in Section 3.8 – Invasive Plant Species and the Framework Reclamation Plan included in Appendix B). Thus under the Proposed Action and all Action Alternatives, increases in noxious weeds would be minimized.

Indirectly, removal of protective vegetation would also expose soil to potential wind and water erosion. This can result in further loss of soil and vegetation, as well as increase sediment input to water resources. However, with implementation of the Project Stormwater Pollution Prevention Plan (SWPPP), erosion and sedimentation effects on vegetation would be temporary and limited to the construction period under the Proposed Action and all Action Alternatives. Proposed EPMS and BMPs aimed at minimizing the effects of erosion caused by vegetation removal are discussed in detail in Section 3.15 – Soils and Section 3.16 – Water Resources, and summarized in Table 2.7-1.

Indirect effects would also result from the fragmentation of connected vegetation types. Fragmentation refers to the breaking up of contiguous areas of vegetation into smaller patches, which results in the creation of habitat edges (areas where two or more vegetation types meet) along the ROW. Edge areas have different microclimatic conditions and structure, which may lead to different species composition than interior area. Due to their greater height and structural complexity, edge effects would be the most drastic in forest and woodland vegetation communities compared to shrubland or grassland communities. Fragmentation and the loss of landscape connectivity can also impact wildlife. A detailed fragmentation analysis is provided in Section 3.10 – General Wildlife and Fish.

Extent and Duration of Effects to Vegetation

The direct and indirect effects of a transmission line crossing shrub-steppe and other low vegetation are generally minor, beyond the localized impacts of structure installation and the construction of roads and other facilities, because the surrounding vegetation is low-growing (i.e., the existing low-growing vegetation would be maintained, thus minimizing changes to vegetation community structure or composition and other functional values). Roads and structures would result in the localized, long-term removal of low-growing shrub-steppe vegetation. However, in forested areas, in addition to the effects of roads and structures, the entire ROW would be cleared of trees tall enough to endanger the line. Therefore, in forested environments, due to the removal of this vertical structure, there would be greater changes in vegetation community structure and composition than in non-forested environments. When conductor ground clearance is greater than 50 feet, for example where the conductor line crosses a canyon or ravine, the trees and shrubs would remain, provided they do not violate minimum clearance thresholds. If the clearance between the transmission line and the ground is at least 100 feet and clearance between the vegetation is at least 50 feet, then the trees would not need to be cleared. The vertical clearance limits in forested environments are illustrated in Figure 3.6-1. Chapter 2 provides a detailed description of the construction ROW, access roads, and other Project facilities.

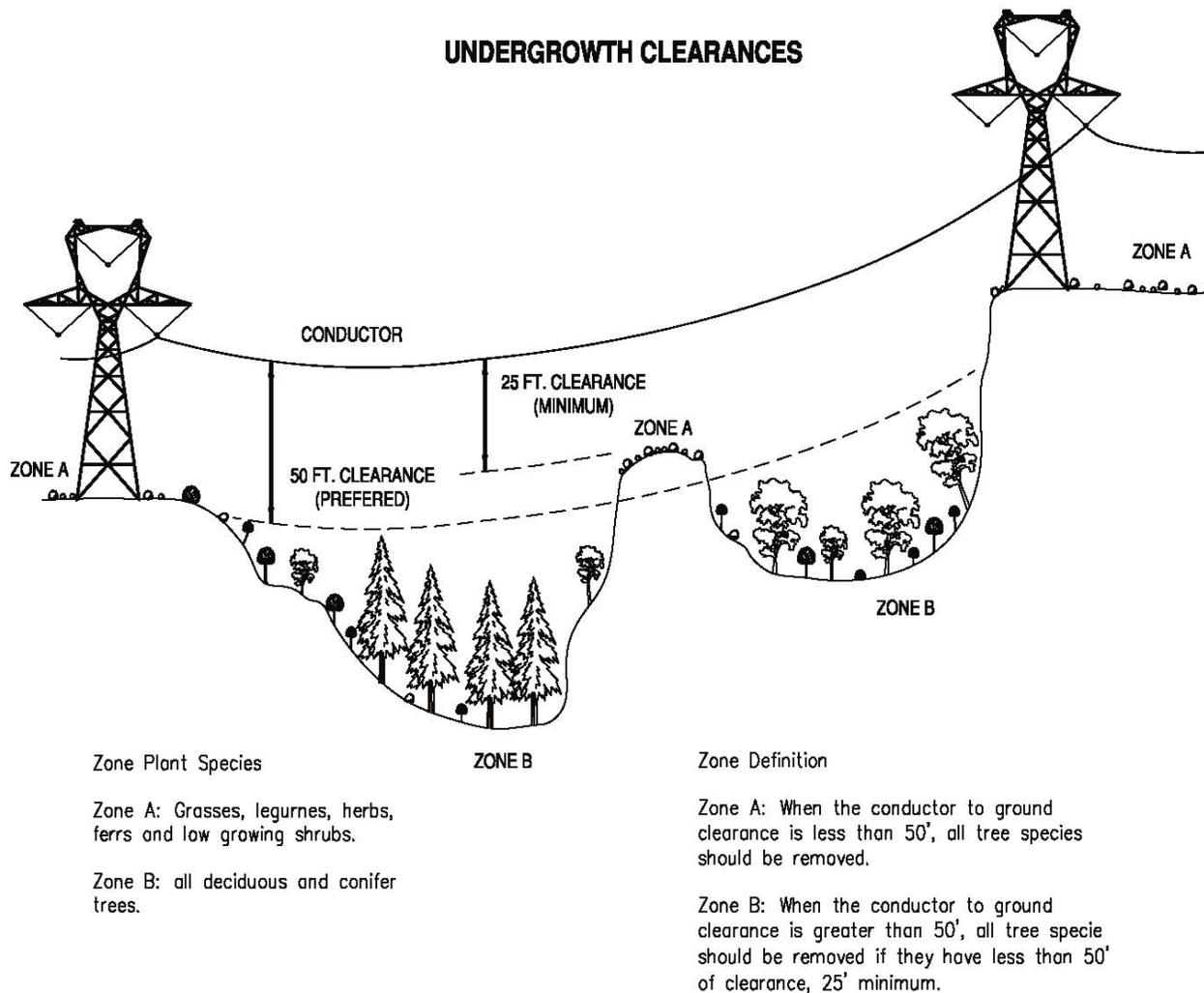


Figure 3.6-1. Vegetation Management Based on Tree Height

During construction, the work areas would be cleared to the extent needed to safely complete the work. Work areas would be revegetated after the initial construction is completed. The recovery of vegetation following construction would vary by plant community type desired following construction (i.e., low-growing vegetation maintained in the ROW for safety). Grasslands and herbaceous wetlands would generally recover within 5 to 7 years. Shrublands may require 30 to 50 years, and forested and woodland areas could take 50 to 100 years to reach mature conditions. Sites with naturally sparse vegetation, saline or alkaline soils, high erosion potential, or shallow soils may be difficult to restore and may require special techniques or repeated revegetation efforts. The vegetative communities that reestablish after construction may differ from pre-construction conditions if soils are modified during construction due to compaction or by breaking up of hardpans.

Measures to Minimize Effects to Vegetation

To minimize direct and indirect effects of vegetation removal under all alternatives, the Proponents have proposed a Framework Reclamation Plan in the POD (Appendix B) that provides procedures for pre-construction treatment of noxious weeds and invasive plants, weed prevention and control, topsoil treatment, ROW restoration (recontouring,

decompaction, and cleanup), stabilization of disturbed areas to minimize erosion and runoff, seedbed preparation, seeding methods, preliminary seed mixes, road reclamation, monitoring, and remedial actions. This plan would be implemented under the Proposed Action and all Alternatives. Reclamation efforts would be scheduled for late fall to early winter where feasible and permitted to facilitate seed establishment when snow and rainfall are more likely. A detailed reclamation schedule would be prepared as part of the Project Reclamation Plan for each segment. Project-specific seed mixes would be developed in consultation with the land manager or landowner.

Reclamation actions would meet short- and long-term reclamation objectives by (pertinent EPMs included in Table 2.7-1 are referenced):

- Using proper soil management techniques, including stripping, stockpiling, and reapplying topsoil material at temporarily disturbed areas of active cropland to restore soil horizons and establish surface conditions that would allow for rapid reestablishment of the productivity of agricultural crops and rangelands. Establishing stable soil surface and drainage conditions, which would minimize surface erosion and sedimentation (REC-16, REC-18, REC-19, and REC-21).
- Conducting pre-construction weed surveys, applying pre-construction weed control measures where appropriate, controlling weed introduction and spread during construction, and conducting post-construction weed monitoring and control activities where needed (REC-1 through REC-15 and REC-17).
- Revegetating disturbed areas with plant species and weed-free seed mixes adapted to site conditions with proper soil amendment and seeding techniques to establish long-term, productive, self-maintaining plant communities to blend in with existing land uses; and concurrently minimize the chances for noxious and invasive weed establishment (REC-13 through REC-17, and REC-23 through REC-26).
- Reestablishing topography to blend in with the surrounding landscape (REC-19 through REC-21).

The following EPMs would reduce construction effects on vegetation. Details of what lands they pertain to are included in Table 2.7-1.

WEED-1 The Proponents shall consult with each appropriate local land management agency (Forest Service and BLM) office or landowner to determine appropriate seed mix and commercial seed source for revegetation. The Reclamation, Revegetation, and Weed Management Plan shall specify the approved seed mixes for federal lands. Disturbed soil will not be allowed to support the growth of noxious weeds or invasive weedy species. Prevention of noxious weeds will apply to all phases of the Project.

VEG-1 During construction, blading of native plant communities should be minimized, consistent with safe construction practices. Where feasible, shrubs should be cut at or near ground level to facilitate regrowth after construction. The footprint of construction and operations facilities should be kept to the minimum necessary.

VEG-2 Where feasible, locate new access roads to minimize the number of trees removed during construction. However, new access roads will not be

relocated if the change would result in an increase in the overall disturbance (acres); require additional cut and fill activities, or impact other sensitive resources (e.g., sagebrush plant community, sensitive species habitat, and/or cultural resources or viewshed).

- VEG-4 Prior to the start of construction and maintenance activities, all contractor vehicles and equipment (including personal protective equipment) shall be cleaned of soil and debris capable of transporting invasive plant seeds or other propagates. All vehicles and equipment shall be inspected by Agency-approved inspectors and certified as weed free by agency-approved personnel, in order to ensure they have been cleaned properly. The final Reclamation, Revegetation, and Weed Management Plan will include the location of all cleaning stations, how materials cleaned from vehicles at these stations would be either captured or treated so that cleaning station locations would not also become infected, and who would confirm/certify that vehicles leaving cleaning stations and/or entering construction sites are free of invasive plant materials.
- VEG-5 The Agency-approved Environmental Construction Inspection Contractor (CIC) will approve weed-free straw or other erosion control materials on federally managed lands prior to application.
- VEG-7 The Proponents will notify the Forest Service when topsoil salvage operations are scheduled and seek assistance with field identification of top soil material.
- VEG-9 The Proponents will meet the terms and stipulations within the timber sale contracts for timber removal operations on the Medicine Bow-Routt, Caribou-Targhee, and Sawtooth NFs.
- REC-16 The topsoil layer will be removed, taking care not to mix it with the underlying sub-soil. Where topsoil separation is employed, topsoil will be stored in a separate stockpile.
- REC-17 Certified weed-free straw, mulch, gravel, and other BMPs as appropriate, will be used as described in the SWPPP to stabilize the stockpile and limit erosion and standing water, control dust, and control the establishment of noxious or invasive weeds in stockpiled soils.
- REC-18 Topsoil and sub-surface soils will be replaced in the proper order during reclamation.
- REC-19 Where it is necessary to spread soils (subsurface soils or waste rock resulting from excavations or foundation drilling), it will be done where practicable and in proximity to where the disturbance occurred (within the ROW). Material will be spread uniformly to match existing contours and covered with topsoil when available and reseeded.
- REC-20 Temporarily disturbed lands within the ROW will be re-contoured to blend with the surrounding landscape. Re-contouring will emphasize restoration of the existing drainage patterns and landform to pre-construction conditions, to the extent practicable. (Tower pads would not be recontoured.)

- REC-21 De-compaction: Areas within the ROW, laydown or staging yards, and other areas of extensive vehicle travel will typically contain compacted soils. These soils will be de-compacted on a case-by-case basis through negotiation with the landowner or land management agency.
- REC-23 The Proponents will utilize soil amendments (e.g., fertilizer, wood or straw mulches, tackifying agents, or soil stabilizing emulsions) on a case-by-case basis and with landowner or land management agency approval. Specific soil amendments will be identified in the final Reclamation Plan and be consistent with the SWPPP.
- REC-24 Broadcast seeding will apply the seed directly on the ground surface. The type of broadcast spreader will depend on the size of the area to be seeded, and the terrain. Seed will be placed in direct contact with the soil, ideally at a depth of approximately 0.5 to 1-inch deep. It will then be covered by raking or dragging a chain or harrow over the seed bed; to remove air pockets.
- REC-25 Drill seeding would be used on areas of sufficient size with moderate or favorable terrain to accommodate mechanical equipment. Drill seeding provides the advantage of planting the seed at a uniform depth.
- REC-26 Hydroseeding, which is the spraying of seeds and water onto the ground surface, or hydroseeding/hydromulching, which is the spraying of seeds, mulch and water, may be implemented on steeper slopes. Tackifier may be added to facilitate adherence of hydromulch to slopes greater than 25 percent.

Given the dry climate, that construction would occur during the summer when the weather is hot and dry, and the vegetation present in the vicinity of the ROW, the potential for fire is relatively high. To minimize the potential for wildfires, state and federal fire prevention requirements would be followed. Fire prevention measures would include enforcing red flag warnings, providing "fire behavior" training to all pertinent personnel, keeping vehicles on or within designated roads or work areas, and providing fire suppression equipment and emergency notification numbers. All construction personnel would also be trained in wildfire risk and prevention and adequate fire suppression equipment would be maintained with each construction crew. Fire prevention measures have been developed (refer to Table 2.7-1), which outline the responsibilities of Project personnel for prevention and suppression of fires and define minimum fire prevention and suppression measures that would be used during Project construction. The Proponents would inspect the transmission line for fire hazards and require that work vehicles carry appropriate fire prevention tools and equipment. Implementing these measures would reduce the risk of fire under all alternatives.

Operations

During operations, long-term vegetation loss would occur within the ROW, where only low-growing vegetation would be maintained, and under permanent structures maintenance areas, substations, regeneration stations, and permanent access roads. Roads developed specifically for this Project that are identified by the Proponents as no longer necessary would be reclaimed as specified in the Reclamation, Revegetation, and Weed Management Plan. Vertical ROW clearing limits in forested environments are illustrated above in Figure 3.6-1.

Maintenance of the ROW under the Proposed Action and all Action Alternatives would involve the use of Integrated Vegetation Management to establish sustainable plant communities on the ROW that are compatible with the electric facilities (i.e., stable, low-growing plant ecotypes that reduce fire risk and maintain safe access to the line and associated facilities). Thus all alternatives would involve some level of site conversion in areas where vegetation management would involve removing tall-growing shrub and tree species and other obstructions near structures. (See descriptions of border and wire zones in the following paragraphs.) Vegetation management practices are outlined in Appendix B. Integrated Vegetation Management may involve use of manual control methods, mechanical control methods, chemical controls, biological controls, or cultural controls, such as taking advantage of seed banks of native, compatible species.

Under Integrated Vegetation Management, the ROW would be divided horizontally into two zones, each with different levels of vegetation maintenance (Figure 3.6-2). Approximately half of the ROW would fall in each zone, as shown on the following illustration. Descriptions of the zones are provided below:

- **The wire zone.** A linear zone under the wires, and extending 10 feet beyond them, would have all trees removed, except where terrain is such that there would be more than 50 feet between the tree tops and the conductors. This may occur where conductors span a valley or canyon,
- **The border zone.** A zone on each side of the wire zone to the edge of the ROW, which would be maintained to exclude vegetation more than 25 feet tall. Where terrain is such that the conductors span a valley or canyon, the border zone would be maintained to prevent trees from growing up that could fall or drop branches onto the conductors at maturity.

Vegetation management would be conducted every 3 to 10 years, depending on conditions such as topography, vegetation types and growth rates, and the potential for vegetation to interfere with safe operation of the line prior to the next clearing cycle. Forested vegetation types (conifer forest, deciduous forest, juniper, forested wetland and riparian; approximately 30 percent of the areas requiring maintenance) would undergo vegetation management on a regular cycle. Other vegetation types would require minimal vegetation management in either the wire zone or border zone during operation because the natural or existing managed vegetation does not grow tall enough to present a hazard to the safe operation of the transmission line. Additional information about Integrated Vegetation Management is provided in the Framework Operations, Maintenance, and Emergency Response Plan in Appendix B.

While access roads constructed for the Project would be allowed and encouraged to revegetate, the vegetation (grass and shrubs) would be kept low because maintenance and inspection personnel would need to access the transmission structures periodically during the life of the Project. For normal maintenance, an 8-foot-wide portion would be used and vehicles would drive directly over the vegetation. The full width of the access road would be used for access by larger vehicles during non-routine maintenance.

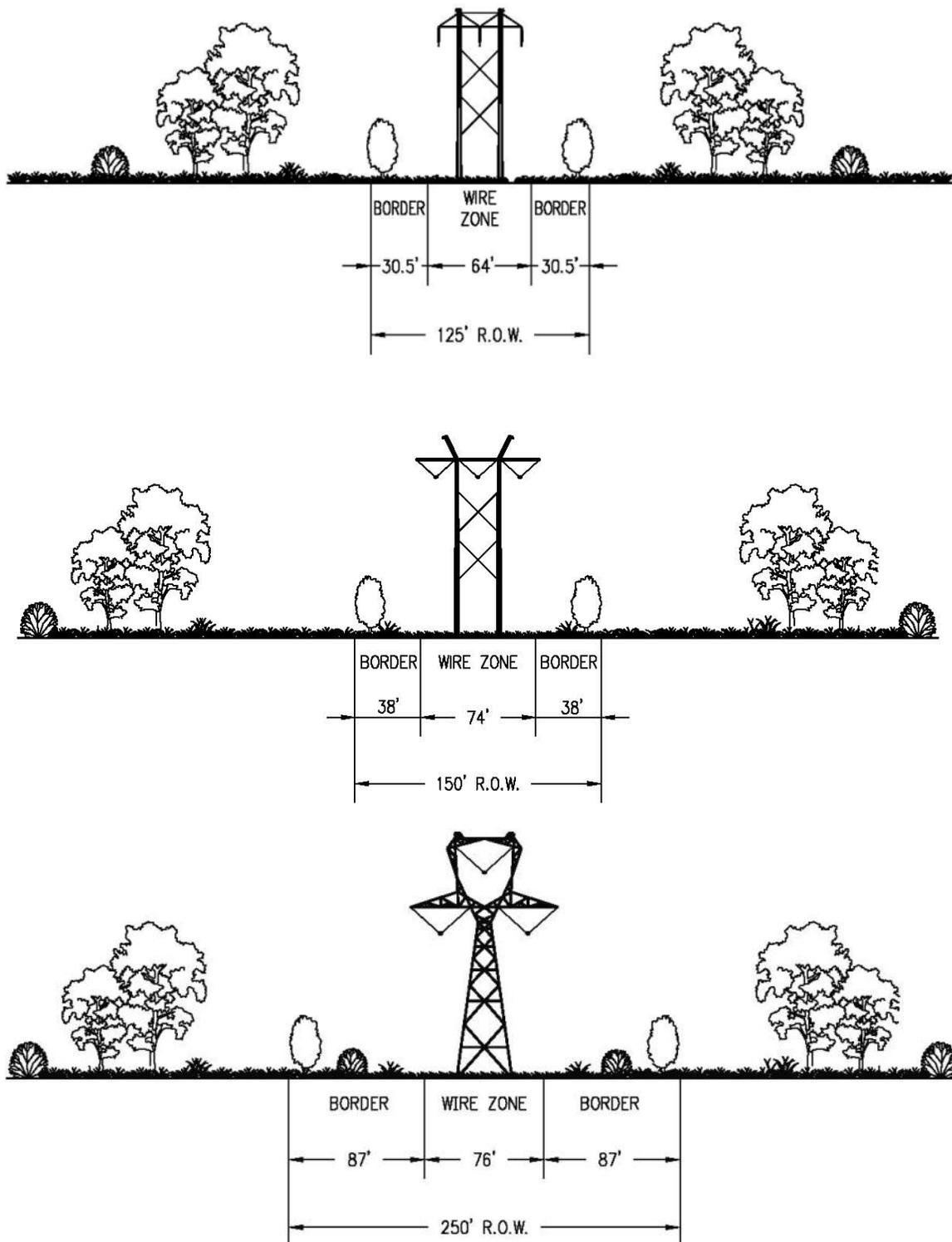


Figure 3.6-2. ROW Integrated Vegetation Management Zones for 230-kV (top), 345-kV (middle), and 500-kV (bottom) Lines

Other ROW maintenance activities would consist of ground inspections, live line maintenance, and grading or repair of access roads and work areas. These activities could result in increased risk of fire or introduction and spread of noxious weeds. The Framework Operations, Maintenance, and Emergency Response Plan in Appendix B includes specific measures that would reduce impacts to vegetation during operation under all alternatives, including noxious weed control and fire protection.

The Proponents have adopted the following EPMs to minimize impacts to vegetation during Project operations through the restoration of disturbed areas. Details on the applicable lands for each EPM are included in Table 2.7-1.

- VEG-3 In areas where revegetation would be completed, topsoil salvage and replacement should be used for areas larger than 1 acre where soils would be disturbed during construction.
- VEG-6 The Proponents will consult with the appropriate land management agency to determine tree seedlings to be planted in decommissioned roadbeds and other temporarily disturbed areas on federally managed lands (where trees were removed) to assure seedlings are matched to site conditions.
- VEG-8 Annual post-construction monitoring and treatment of invasive plants on closed roads (access roads dedicated for use by Proponents only), temporary roads, fly yards, and other disturbed areas in the ROW shall continue for 3 years in areas where infestations or populations of noxious weeds have been identified. If after 3 years post-construction conditions are not equivalent to or better than pre-construction conditions (in accordance with applicable permit), monitoring and treatment will continue until these conditions are met. If adjacent land uses are contributing to the introduction and/or persistence of invasive plant species within areas disturbed by the project, then Proponents will not be required to treat noxious weeds for more than three years.

Decommissioning

Decommissioning activities would restore vegetation within the Project footprint. Project facilities would be removed at the end of the operational life of the transmission line. Structures and foundations would be removed to below ground surface. In order to complete decommissioning, impacts similar to the initial construction disturbance would be expected. Roads would be widened to accommodate the large cranes and heavy equipment needed to dismantle and remove the steel towers, regeneration stations, and substations. Staging areas would be needed to temporarily store decommissioned materials, and some further disassembly would be expected at the multipurpose yards before the materials were hauled away for recycling or disposal. After towers and conductors were removed from the ROW, heavy equipment would restore contours to the extent feasible. Disturbed areas would be reseeded with a weed-free seed mix. Where feasible and in coordination with the land-managing agency or landowner, roads would be recontoured to match adjacent areas, and would be ripped to facilitate revegetation where required. Recovery times for vegetation would be similar to those previously described for recovery from temporary construction activities but could be longer depending on the amount of compaction. Decompaction may be necessary for successful reclamation (see Section 3.15 – Soils). EPM SOIL-3 provides for this activity

prior to reseedling after decommissioning. Forest type–appropriate tree species would be replanted if there is not adequate natural regeneration. Additional details concerning decommissioning are provided in Appendix B.

Effects to Vegetation on Federal Lands

Table 3.6-2 summarizes construction and operations effects to vegetation on federal lands under the Proposed Action. Tables D.6-5 and D.6-6 in Appendix D summarize effects to vegetation on federally managed lands from construction and operations of the Project, respectively, by proposed and alternative transmission line segments.

Table 3.6-2. Impacts (acres) to Vegetation on Federal Lands under the Proposed Action

Land Ownership	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total Impacts ^{5/}
	Const. Fac. ^{3/}	Const./ Op. Fac.	ROW	Const./ Op. Fac.	ROW	Const. Fac.	Const. Fac.	
Construction								
BLM	5,649	251	316	16.9	1.2	1,964	306	8,504
Forest Service	56	124	200	0.3	0.8	12	5	399
Caribou-Targhee National Forest (NF)	22	118	179	t ^{6/}	2	0	7	328
Medicine Bow-Routt NFs	35	12	17	t ^{6/}	–	–	t ^{6/}	64
Sawtooth NF ^{7/}	–	–	–	–	–	–	–	–
Bureau of Reclamation	117	–	–	0.3	–	15	1	133
Military Reservation/Corps of Engineers	4	–	–	–	–	3	–	7
Operations								
BLM	643	33	426	1.9	1.4	201	62	1,369
Forest Service	6	15	259	t ^{6/}	0.8	–	2	282
Caribou-Targhee NF	2	16	235	t ^{6/}	2	–	2	257
Medicine Bow-Routt NFs	4	2	23	t ^{6/}	–	–	–	30
Sawtooth NF ^{7/}	–	–	–	–	–	–	–	–
Bureau of Reclamation	13	–	–	t ^{6/}	–	2	<1	15
Military Reservation/Corps of Engineers	1	–	–	–	–	1	–	2

1/ “Shrublands” include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ “Forest/woodlands” include conifer and deciduous forest and juniper woodlands.

3/ Const./Op. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing.

4/ “Other Cover Types” include agriculture, disturbed/developed, water, areas with no vegetation data, and “miscellaneous” (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals column.

6/ Value is less than 0.1 acre.

7/ The Proposed Route Segment 7 does not cross the Sawtooth NF. See Tables D.6-5 and D.6-6 to see impacts to vegetation on federal lands by the Alternatives.

Impacts to Mature and Old-growth Forest

The Forest Service requested that impacts to old-growth forest be addressed by national forest crossed by the Project. Old-growth forests are ecosystems distinguished by old trees and related structural features such as tree size, amount of large dead woody material, number of canopy layers, species composition, and ecosystem function (Hamilton 1993). Available vegetation data were obtained from the Sawtooth, Medicine Bow-Routt, and Caribou NFs to determine whether the Project crosses areas of mature or old-growth forest. Data were limited in that only the Medicine Bow-Routt NFs had a GIS layer indicating forest successional stages. For the Sawtooth NF a broad scale vegetation layer was provided by the Forest that included data on tree size, canopy cover, and cover type. Using the Forest Service Region 4 definition for old-growth

(Hamilton 1993), it was possible to identify if these were mature or old-growth conifer forest stands.

A maximum of 297 acres of forest/woodland vegetation would be impacted by the Project on the Caribou-Targhee NF under the Proposed Action along Segment 4 (based on the Project GIS database; Table 3.6-2). Using the Forest Service's vegetation database, which classifies more acres as shrubland and fewer acres as forest land, approximately 243 acres of forest/woodland vegetation would be impacted by construction on the Caribou-Targhee NF under the Proposed Action. Of this, approximately 145 acres are conifer, 69 acres are deciduous, and 29 acres are mixed conifer/deciduous (Table 3.6-9). Approximately 120 acres of conifer forest, 61 acres of deciduous forest, and 22 acres of mixed conifer/deciduous forest would be permanently impacted during operations (Proposed Route; Table 3.6-9). Roughly 95 percent of these acres consist of mature forest (Beck 2010). The landscape outside of the ROW is also dominated by mature forest (Forest Service 2003a) and has similar species composition. At the 5th code Hydrologic Unit Code (HUC) scale, the acreage of mature forest impacted by the Project would be well below the maximum allowable by the Caribou Forest Plan Vegetation Standard 2 and should not prevent the Forest Service from meeting the requirements of maintaining at least 20 percent of the forest in mature and old age classes. To ensure compliance with their Forest Plan, the Montpelier Ranger District of the Caribou-Targhee NF requested that a field study be conducted to verify whether or not forest stands crossed by the Project along Segment 4, and identified as having characteristics suggestive of old-growth during an initial qualitative assessment using Project vegetation mapping and aerial photography, consisted of old-growth. In response, a field study was conducted in July 2010, using Forest Service Region 4 Common Stand Exam/Quick Plot protocol, to determine if four stands crossed by the Project met the Region 4 definition of old-growth (as required in Vegetation Standard 3 of the Caribou Forest Plan) in terms of tree size, age, and density. Results of this field study indicated that none of the forest stands crossed by the Project met the minimum definitions of old-growth (Tetra Tech 2010b). Compliance with related standards and guidelines is discussed below.

The Project would impact a minimum of 29 acres of mature forest during construction and 25 acres during operations on the Medicine Bow-Routt NFs along Proposed Routes for Segments 1W(a) and 1W(c) (based on the Project GIS database; Table 3.6-2). However, the Proposed Route does not cross areas that meet the definition of old-growth forest. Using the Forest Service's vegetation data, up to 54 acres of forest/woodland vegetation would be impacted by construction and up to 53 acres would be impacted by operations (Proposed Route). Additionally, no tree removal would occur on slopes greater than 40 percent, in accordance with Medicine Bow Forest Plan standards.

The Proposed Route would not cross the Sawtooth NF; however, Alternative 7K would. Although GIS data from the Sawtooth NF do not include information on forest age class or seral stage, Alternative 7K would impact approximately 15 acres of forested vegetation during construction that possess potential mature forest characteristics (41-70 percent canopy cover with trees between 12 and 20 inches diameter at breast height).

On the Medicine Bow-Routt, Caribou-Targhee, and Sawtooth NFs, where the ROW passes through the forest/woodland habitat type, the edges of the ROW would be “feathered,” or cut so that the edge of the ROW is not straight, to reduce visual effects. This would be accomplished by removing trees farther into the forest than the standard width of the ROW. In areas where feathering would occur, impacts to forest/woodland vegetation would increase by approximately 15 percent on these forests, above that reported in the tables below and in Appendix D (Tables D.6-2 through D.6-6). Feathering would be a one-time vegetation treatment, and this type of ROW edge would not be maintained throughout Project operations. An impact to the forest/woodland vegetation from feathering would be to convert the forest to an earlier successional stage due to the removal of the largest trees.

Impacts to Suitable Timberlands

Approximately 179 acres of forest would be within the ROW on the Caribou-Targhee NF (Table 3.6-2). Merchantable timber would be cut and yarded to landings where the logs would be loaded on to trucks and hauled to market. Unmerchantable logs would be stored along the edge of the ROW for later use in site restoration. Ground-based logging equipment would be used to harvest the majority of the logs. Approximately 13 acres of mature conifer forest within the ROW are on slopes greater than 40 percent. The Caribou Forest Plan does not permit ground-based logging equipment to be used on slopes greater than 40 percent. Helicopters would be used to harvest these areas. Approximately 2 acres in Section 10, Township 12 South, 1 acre in Section 6, Township 12 South, Range 42 East, and 3 acres in Section 2, Township 12 South, Range 41 East could be flown to landings adjacent to roads on relatively flat areas within the ROW. The largest concentration of timber on slopes greater than 40 percent, approximately 7 acres, is in Section 1, Township 12 South, Range 41 East. This timber could be flown the proposed fly yard just east of Forest Road 20444.

The Project crosses areas mapped as being suitable for commercial management activities on the BLM Pocatello FO. However, according to the BLM, these mapped areas in many cases are based on 50-year old stand inventories and have been affected by bark beetle infestation, and are thus no longer representative of current commercial forest conditions (Swan 2010). However, on the Pocatello FO there are two salvage sale areas. One is approximately 59 acres, located approximately 0.5 mile north of Alternative 5B. The other is approximately 56 acres and is crossed by Alternatives 7B and 5B. Alternative 7B would impact approximately 1.2 acres of conifer forest in this area, and Alternative 5B would impact 16 acres. Given that under both alternatives less than 10 percent of the salvage sale would be impacted, no appreciable reduction in the timber base would occur. In addition, roads constructed by the Project (one would pass through the salvage sale area) would provide the BLM with access to these areas, which would off-set any loss of timber acreage.

The BLM Pocatello FO has also identified four other potential areas in the Deep Creek Mountains where commercial forestry activities will be a future focus (Swan 2010). These are broad areas ranging in size from roughly 4,950 acres to 10, 320 acres in which commercial forest projects would be considered. Four transmission line segment traverse these areas and would require clearing of conifer forest including the Segment 5 Proposed Route (10 acres), Alternative 5A (54 acres), the Segment 7 Proposed Route

(24 acres), and Alternative 7A (64 acres), including acreage disturbed for facilities as well as within the cleared ROW.

The Kemmerer FO has identified three ongoing or foreseeable commercial timber projects that coincide with the Project Analysis Area. These projects include:

- **Proposed Aspen Front KFO**—Removal of competing subalpine fir from aspen stands and salvage of dead lodgepole pine (planning process)
- **Proposed Commissary White Bark Sanitation Project**—Removal of competing subalpine fir from whitebark pine stands (contract awarded)
- **Proposed Wheat Creek Aspen Treatment**—Removal of competing subalpine fir from aspen stands (pre-planning process)

The BLM expressed concern that Project-related timber removal could reduce revenue potential from sale of associated forest products. The proposed Aspen Front Project is crossed by Alternative 4F (conifer removal: 23 acres construction, 18 acres operations).

Prior to Project construction, a timber cruise would be performed on portions of the ROW that overlap BLM and Forest Service timbered areas to determine the volume of the timber before it is cut. The price of the timber would be negotiated according to 43 CFR Part 5402.0-6. Payment to Treasury would be made, or the sale of the timber would be complete, before the trees are cut. Other vegetative resources not normally measured in board feet but that would be sold and removed from federal lands would be appraised and sold at the appraised value, as required under 43 CFR 5420.0-6.

The Agencies have identified the following mitigation measure related to the sale of timber and vegetative resources that would be required on federal land:

- VEG-10 All timber and other vegetative resources to be sold or removed from federal lands will be appraised and sold at the appraised value.

Plan Amendments

There are several plan amendments listed in Appendix F that do not directly apply to vegetation but would impact vegetation if implemented. These include:

- Amendments to change BLM VRM classes to allow construction of the Project due to nonconformance with the VRM class. Specific amendments would be required under the Bruneau MFP (Proposed Route for Segment 9), Caribou Forest Plan (Proposed Route for Segment 4 and Alternative 4G), Cassia RMP (Alternatives 7K and 7E), Jarbidge RMP (Proposed Routes for Segments 8 and 9, Alternatives 8A, 9B, and 9D), Bennett Hills/Timmerman Hills (Proposed Route for Segment 8), and SRBOP RMP (Proposed Route for Segment 8, Alternatives 8E, 9D, 9F 9G, and 9H).
- Amendments to standards that limit utilities to existing facilities and locations. Specific amendments would be required under the Caribou Forest Plan (Proposed Route for Segment 4), Cassia RMP (Proposed Route for Segment 7), Twin Falls MFP (Proposed Route for Segment 9, and Alternative 9A), and SRBOP RMP (Proposed Route for Segments 8 and 9, and Alternatives 8D, 8E, 9D, 9E, 9F, 9G, and 9H), Jarbidge RMP (Proposed Route for Segment 9), Medicine Bow Forest Plan (Proposed Route for Segment 1W), Kuna MPF

(Proposed Route for Segment 8 and Alternatives 8B and 8C), and Kemmerer RMP (Proposed Route for Segment 4 and Alternatives 4C and 4E).

- Amendments to allow the Project as a visually altering action without changing the VRM or VQO class, or for construction in an otherwise restricted area. Specific amendments for the former circumstance would be required under the Green River RMP (Proposed Route for Segment 4), Cassia RMP (Alternative 7K), Pocatello RMP (Proposed Route for Segments 5 and 7), Twin Falls MFP (Proposed Route for Segment 9), and Medicine Bow Forest Plan (Proposed Route Segment 1W[a,c]). Specific amendments for the latter circumstance would be required under the Twin Falls MFP (Proposed Route Segment 9), Jarbidge RMP (Proposed Route for Segment 9, Alternative 9B, Proposed Route for Segment 8, and Alternative 8A), SRBOP (Proposed Route for Segments 8 and 9, Alternative 8E, and Alternatives 9D and 9F through 9H); and Caribou Forest Plan (Proposed Route for Segment 4 and Alternative 4G).
- Amendments to allow construction in the habitat of a special status wildlife species, including the goshawk nesting and foraging areas, sage-grouse breeding areas, raptor nests, and wetland habitat for the northern leopard frog. Specific amendments would be required under the Medicine Bow Forest Plan (Proposed Route for Segment 1W[a,c]), and Caribou Forest Plan (Proposed Route for Segment 4 and Alternative 4G).

Amendments associated with BLM VRM classification and Forest Service Land Use Designations would result in the disturbance to or removal of vegetation within the ROW and associated indirect effects (invasive species, fire risk, fragmentation). The Project would have the greatest effect on forest/woodland vegetation where tree removal would result in conversion of the vegetation to an earlier successional stage, and would be maintained within the ROW during operations. In shrubland and other low-growing vegetation types, vegetation would regrow within the ROW after construction. These effects are described in detail above and acres of vegetation impacted along the various segments are provided below in Section 3.6.2.3. Additional vegetation impacts could occur if future projects are permitted and built within these newly reclassified areas. This cumulative effect is discussed in Chapter 4. The amendments for single-use exemptions due to noncompliance for visual resource standards or for development in otherwise restricted areas would have similar effects to the VRM reclassification amendments, except that there would be no long-term indirect effect of other projects being proposed in the same area.

Amendments to standards that limit utilities to existing facilities and locations would also result in the disturbance to or removal of vegetation and associated impacts. Impacts to vegetation along the segments where these amendments would be required are also described below in Section 3.6.2.3. In these circumstances, vegetation removal would increase the level of fragmentation because development would occur outside of existing facilities, creating new disturbance.

Amendments to allow construction within a goshawk nesting and foraging area, within raptor nest buffers, and within habitat for the boreal toad, wood frog, and northern leopard frog may result in removal of forest and wetland vegetation within the ROW,

respectively. Impacts to these vegetation types along the segments where these amendments would be required are described below in Section 3.6.2.3.

There are standards and guidelines related to restoration of disturbed areas and weed control in multiple land use management plans. Amendments were not proposed for these measures, because the EPMs described above, within the following discussions of impacts by segments, and listed in Section 3.6.3 as well as in Table 2.7-1 would ensure Project conformance with these standards. For example, Decision 4003 of the Casper RMP requires “appropriate mitigation measures to minimize impacts to vegetative resources” where surface disturbance or development occurs. EPM VEG-1 requires minimizing disturbance footprints and restoration of Project areas using native vegetation.

3.6.2.3 Comparison of Alternatives by Segment

It is assumed that the direct and indirect effects of the construction and operations of the proposed Project area discussed above are proportional to the acres of land affected during construction and operations. Table D.6-2 in Appendix D contains the anticipated disturbance from construction for the Proposed Route and each of the Route Alternatives. Table D.6-3 in Appendix D provides a summary of impacts resulting from operations and maintenance for the Proposed Route and each of the Route Alternatives. Route Alternatives are compared to the portion of the Proposed Route that starts and ends at the same nodes as the Route Alternative (referred to as the “comparison portion of the Proposed Route”). Based on the vegetation-related issues identified during public scoping (see Section 3.6.1.2 above), the Alternatives discussion below focuses on impacts to sagebrush/shrubland, forest, and grassland. These are major vegetation types important to many of the special status plant and wildlife species addressed in Sections 3.7 – Special Status Plants and 3.11 – Special Status Fish and Wildlife, respectively.

Segment 1W

The preferred routes in Segment 1W are as follows:

Segment	Preferred Route	Agency
Segment 1W(a)	Proposed Route (Figure A-2)	BLM and State of Wyoming
Segment 1W(c)	Proposed Route (Figure A-2)	BLM and State of Wyoming

Segment 1W is composed of Segments 1W(a) and 1W(c), both of which consist of single-circuit 230-kV transmission lines. Generally, Segment 1W(a) would be a new 73.8-mile-long transmission line, and 1W(c) would involve reconstruction of a 73.6-mile-long portion of the existing Dave Johnston – Rock Springs 230-kV transmission line. However, in the area approximately 5 miles to the north and south of Ice Cave Mountain, the lines shift east to avoid the ice cave. In this area, 1W(a) would be the reconstruction of the existing line and 1W(c) would be the new line. Segment 1W(a) has one alternative, Alternative 1W(a)-B, which is located north and west of the town of Glenrock and was the Proponents’ initial proposal. However, the Proposed Route was revised following the Draft EIS public comment period in order to avoid the more populated area around Glenrock. Figure A-2 in Appendix A shows the location of the Segment 1W routes.

The Preferred/Proposed Routes for Segments 1W(a) and 1W(c), the two single-circuit lines, would cross sagebrush for a majority of their lengths (Table D.6-1 in Appendix D).

Alternative 1W-A primarily crosses disturbed grassland and natural sagebrush whereas the comparison portion of the Preferred/Proposed Route primarily crosses natural sagebrush and grassland vegetation (Table D.6-1 in Appendix D).

In addition to new construction and transmission structure replacement, 21 transmission structures would be removed where the new line deviates from the old route. Areas disturbed during structure removal would be restored.

Construction

The impacts from construction of Segment 1W and its alternatives are presented in Table 3.6-3. Construction of the Preferred/Proposed Route and clearing of the ROW along Segment 1W would directly affect 1,833 acres (1W[a] and 1W[c] combined) for installation of the transmission line, a majority of which (over 70 percent) is shrubland.

Table 3.6-3. Comparison of Construction-related Vegetation Impacts (acres) for Segment 1W

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Preferred/Proposed 1W(a) Total Length	557	26	33	7.9	2.6	75	111	812
Preferred/Proposed – Comparison Portion for Alternative 1W(a)-B	57	1	1	1.9	2.4	62	26	151
Alternative 1W(a)-B	158	<1	2	<1	–	99	14	273
Preferred/Proposed 1W(c) Total Length	733	47	61	8.3	3.2	116	53	1,021

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

Alternative 1W(a)-B would result in approximately double the vegetation disturbance of the comparison portion of the Preferred/Proposed Route. Alternative 1W(a)-B would require less forest and wetland/riparian clearing but more disturbance to natural vegetation (e.g., natural sagebrush and native grassland; Table D.6-2 in Appendix D) than the comparison portion of the Preferred/Proposed Route.

Medicine Bow-Routt National Forests Crossed by Segment 1W

The Preferred/Proposed Route would impact vegetation within the Medicine Bow-Routt NFs. See Table D.6-5 in Appendix D for the acres of vegetation types impacted on federally managed lands.

Operations

Table 3.6-4 presents operations impacts associated with Segment 1W and its alternative. During operations of the proposed Project along Segment 1W, approximately 433 acres of vegetation would be permanently affected by Project features (Segments 1W[a] and 1W[c] combined), of which approximately 300 acres would be cleared for operations facilities and 132 acres of vegetation, located between structures along the ROW, would be maintained in early seral stage.

Alternative 1W(a)-B would permanently affect approximately 15 acres of vegetation more than the comparison portion of the Preferred/Proposed Route, primarily consisting of shrubland. Alternative 1W(a)-B would result in fewer acres affecting wetland/riparian communities than the Preferred/Proposed Route (Table 3.6-4).

Table 3.6-4. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 1W

Segment or Alternative	Shrubland ^{1/}		Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Op. Fac. ^{3/}	ROW	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.		
Preferred/Proposed 1W(a) Total Length	119	43	4		1.5	3.2	19	33	223
Preferred/Proposed – Comparison Portion for Alternative 1W(a)-B	9	1	t ^{6/}		<1	3.1	12	6	31
Alternative 1W(a)-B	25	2	t ^{6/}		t ^{6/}	–	14	4	46
Preferred/Proposed 1W(c) Total Length	93	82	7		0.9	4.0	11	12	210

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Segment 2

The preferred route in Segment 2 is as follows:

Preferred Route	Agency
Proposed Route (Figure A-3)	BLM and State of Wyoming

Segment 2 consists of one single-circuit 500-kV transmission line between the proposed Aeolus Substation and the location of the originally planned Creston Substation near Wamsutter, Wyoming (a new substation at Creston is no longer needed due to changes in anticipated demand for oil and gas field electricity). The Preferred/Proposed Route has been revised to incorporate Alternative 2C, as analyzed in the Draft EIS. Segment 2 would be approximately 91.9 miles long. Alternative 2A is being considered by the BLM because this alternative route is within the WWE corridor. Alternative 2B was initially the Proponents' Proposed Route before they responded to local suggestions and relocated the Proposed Route farther to the south. Figure A-3 in Appendix A shows the location of the Segment 2 routes. The Preferred/Proposed Segment 2 and its alternatives cross an area primarily consisting of sagebrush, disturbed sagebrush, dwarf shrub, and greasewood.

Construction

The impacts from construction of Segment 2 and its alternatives are presented in Table 3.6-5. Construction of the Preferred/Proposed Route and clearing of the ROW along Segment 2 would directly affect 1,785 acres for installation of the transmission line, a majority of which (91 percent) is shrubland. Because this segment crosses low-growing vegetation, most of the construction disturbance is related to the installation of Project facilities rather than vegetation removal for the ROW.

Table 3.6-5. Comparison of Construction-related Vegetation Impacts (acres) for Segment 2

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Preferred/Proposed Segment 2 – Total Length	1621	2	5	8.8	–	2	147	1,785
Preferred/Proposed – Comparison Portion for Alternative 2A	283	–	–	3.7	–	t ^{6/}	22	309
Alternative 2A	324	–	–	13.3	3.9	–	17	359
Preferred/Proposed – Comparison Portion for Alternative 2B	219	–	–	3.7	–	t ^{6/}	15	238
Alternative 2B	185	–	–	18.0	2.8	–	6	212

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Alternative 2A would impact more vegetation than the comparison portion of the Preferred/Proposed Route (359 acres and 309 acres, respectively). Alternative 2B would result in less vegetation disturbance than the comparison portion of the Preferred/Proposed Route (212 acres and 238 acres, respectively), primarily consisting of shrublands.

Operations

Operations impacts to vegetation along Segment 2 and its alternatives are presented in Table 3.6-6. During operations of the proposed Project along Segment 2, approximately 251 acres of vegetation would be permanently affected by Project features, of which 84 percent would be cleared for operations facilities.

Alternative 2A would result in less vegetation disturbance than the comparison portion of the Preferred/Proposed Route (44 acres and 28 acres, respectively). However, Alternative 2A would result in greater permanent reduction in wetland/riparian vegetation than the comparison portion of the Preferred/Proposed Route. Alternative 2B and the comparison portion of the Preferred/Proposed Route would have similar permanent effects to vegetation (21 acres each), but with greater reduction in wetland/riparian vegetation occurring under Alternative 2B.

Table 3.6-6. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 2

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Op. Fac. ^{3/}	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	
Preferred/Proposed Segment 2 – Total Length	207	<1	6	1.6	–	<1	36	251
Preferred/Proposed – Comparison Portion for Alternative 2A	23	–	–	<1	–	t ^{6/}	5	28
Alternative 2A	34	–	–	0.5	3.9	–	5	44
Preferred/Proposed – Comparison Portion for Alternative -2B	18	–	–	<1	–	t ^{6/}	3	21
Alternative 2B	16	–	–	<1	2.9	–	1	21

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Segment 3

The preferred route in Segment 3 is as follows:

Preferred Route	Agency
Proposed Route, including 3A (Figure A-4)	BLM and State of Wyoming

A single-circuit 500-kV line would link the former location of the Creston Substation, approximately 2.1 miles south of Wamsutter, Wyoming, to the proposed Anticline Substation near the existing Jim Bridger Power Plant. Segment 3 would be approximately 45.9 miles long. This segment also includes a 5.1-mile segment of 345-kV line to connect to the existing Jim Bridger Power Plant Substation (Segment 3A). There are no alternatives proposed along Segment 3. Figure A-4 in Appendix A shows the location of the Segment 3 routes. Preferred/Proposed Segment 3 crosses an area primarily consisting of sagebrush, saltbush, dwarf shrub, and greasewood.

Construction

The impacts to vegetation from construction of Segment 3 and 3A are presented in Table 3.6-7. Construction of the Preferred/Proposed Route and clearing of the ROW along Segment 3 and 3A would directly affect 834 and 60 acres, respectively, for installation of transmission line facilities (infrastructure, roads, temporary multipurpose yards, and fly yards). A majority of the vegetation impacted consists of shrubland (94 percent) but also includes 4 acres of wetland/riparian vegetation.

Operations

The impacts from operations of Segment 3 and 3A are presented in Table 3.6-7. During operations of the proposed Project along Segment 3, approximately 140 acres of vegetation would be permanently affected by Project features. Approximately 12 acres of vegetation would be permanently affected along Segment 3A.

Table 3.6-7. Acreage Affected by Construction and Operations of Segment 3

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grass land	Other Cover Types ^{4/}	Total ^{5/}
	Fac. ^{3/}	Fac.	ROW	Fac.	ROW	Fac.	Fac.	
Preferred/Proposed Segment 3 – Total Length – Construction	785	–	–	3.5	–	1	44	834
Preferred/Proposed Segment 3A – Total Length – Construction	47	–	–	2.0	–	–	11	60
Preferred/Proposed Segment 3 – Total Length – Operations and Maintenance	128	–	–	<1	–	t ^{6/}	12	140
Preferred/Proposed Segment 3A – Total Length – Operations and Maintenance	7	–	–	<1	–	–	4	12

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Segment 4

The preferred routes in Segment 4 are as follows:

Preferred Route	Agency
Proposed Route (Figures A-5 and A-6) except within the Caribou-Targhee NF (see below)	BLM, State of Wyoming, and Lincoln County
Proposed Route within the NF incorporating Alternative 4G (Figure A-6)	Forest Service

Segment 4 would link the proposed Anticline Substation and the existing Populus Substation near Downey, Idaho, with a single-circuit 500-kV line. Its proposed length is approximately 197.6 miles. The Segment 4 BLM-Preferred/Proposed Route was revised to follow Alternative 4A, as analyzed in the Draft EIS, based on public comments. This segment generally follows an existing transmission line corridor. Segment 4 has five Route Alternatives in the middle portion of its route; however, the first 52 miles to the east and the last 61 miles to the west (in Idaho) do not have any route alternatives. The middle section of the BLM-Preferred/Proposed Route, for which alternatives are presented, is approximately 85.2 miles long, and its alternatives vary from approximately 87.5 to 102.2 miles long. Alternatives 4B through 4E were proposed by the BLM Kemmerer FO (with input from various cooperating agencies), with the intent to avoid impacts to cultural resources to the extent practical. Alternative 4F was proposed by the Proponents to avoid impacts to cultural resources while still remaining north of the existing Bridger Lines. Figures A-5 and A-6 in Appendix A show the location of the Segment 4 routes in Wyoming and Idaho, respectively. Alternative 4G was proposed by the Forest Service in order to avoid unstable soils identified along the Proposed Route during the 2012 soil assessment (it is located within Sections 1 and 2, Township 12 South, Range 41 East). BLM-Preferred/Proposed Segment 4 and its

alternatives cross an area dominated by shrubland, with components of disturbed sagebrush, conifer and deciduous forest, and agriculture (Table D.6-1).

Construction

The impacts from construction of Segment 4 and its alternatives are presented in Table 3.6-8. Construction of the BLM-Preferred/Proposed Route and clearing of the ROW along Segment 4 would directly affect about 4,247 acres for installation of the transmission line, primarily consisting of shrubland (70 percent) and forest/woodland vegetation (13 percent). This includes vegetation cleared to accommodate installation of facilities including infrastructure, roads, temporary multipurpose yards, and fly yards, as well as vegetation along the ROW that would be cleared.

Table 3.6-8. Comparison of Construction-related Vegetation Impacts (acres) for Segment 4

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Preferred/Proposed Segment 4 – Total Length	2957	206	346	122	4.3	148	464	4,247
Preferred/Proposed – Comparison Portion for Alts. 4B–F	1,508	16	31	70	1.6	42	78	1,747
Alternative 4B	1,861	2	3	49.4	0.5	19	151	2,086
Alternative 4C	1,838	1	2	46.4	0.5	17	170	2,075
Alternative 4D	1,887	4	4	49.5	0.5	19	151	2,115
Alternative 4E	1,844	3	4	46.6	0.5	17	170	2,085
Alternative 4F	1,511	37	54	56.2	2.6	41	83	1,785

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

Alternative 4D would have the greatest effect on general vegetation (2,115 acres), followed by Alternative 4B (2,086 acres), Alternative 4E (2,085 acres), Alternative 4C (2,075 acres), Alternative 4F (1,785 acres), and the comparison portion of the Preferred/Proposed Route (1,747 acres). All of the alternatives would affect more shrubland than the comparison portion of the BLM-Preferred/Proposed Route, but all alternatives would affect less wetland/riparian vegetation than the comparison portion of the BLM-Preferred/Proposed Route. Alternative 4F would affect the greatest amount of forest and woodland vegetation (Table 3.6-8). Given that there would be no loss of old growth under any of the alternatives, all alternatives would be consistent with the Caribou-Targhee NF standard of maintaining at least 20 percent mature and old age classes within each fifth-field HUC watershed.

Caribou-Targhee National Forest Crossed by Segment 4

Within the Caribou portion of the Caribou-Targhee NF, construction along the Proposed Route of Segment 4 would affect approximately 328 acres (see Tables 3.6-2). Of this, approximately 297 acres are dominated by forest/woodland vegetation and the rest are dominated by non-forested vegetation. At the request of the Caribou-Targhee NF, the Forest's vegetation database was used to evaluate vegetation impacts on the NF (Table 3.6-9). This database

includes vegetation categories that are different than those listed in Table 3.6-1; therefore, impact acreages presented in Table 3.6-9 are different than those presented in Tables 3.6-2 and in Tables D.6-5 and D.6-6 in Appendix D. Based on the Forest's vegetation database, a total of 243 acres of forest/woodland vegetation would be impacted during construction (Table 3.6-9). As requested by the Montpelier District of the Caribou-Targhee NF, an initial mapping effort and field review was conducted to identify whether or not any of the forest stands crossed by the Project potentially met the Forest Service Region 4 definition of old-growth (Hamilton 1993). Four stands identified as warranting more detailed stand examination were subsequently visited in July 2010. The results of this field effort, which involved the use of Forest Service Region 4 Common Stand Exam/Quick Plot protocol, indicated that none of the forest stands crossed by the Project met the Region 4 definition of old growth (Tetra Tech 2010b). Therefore, the proposed Project would not result in the removal of any old-growth forest stands.

The Caribou Forest Plan has a standard that states that at least 20 percent of the forested acres within a fifth-field HUC watershed must be maintained in mature and old-age classes. The Project would not result in reducing the amount of mature and old-age classes to below the 20 percent level in either of the two fifth-field watersheds that would be crossed. The standard also states that at least 15 percent of the forested acres must meet, or be managed to attain, Region 4 old-growth conditions (Hamilton 1993). Field surveys conducted in 2010 in forest stands on the Caribou-Targhee NF that exhibited potential old-growth characteristics determined that none of these forest stands on the Forest crossed by the Project met Forest Service Region 4 definitions for old-growth. Given that the Project would not result in the removal of any old-growth, the Project would be consistent with these Forest Plan standards.

There are two routes considered across the Caribou-Targhee NF (i.e., the Proposed Route discussed above, as well as Alternative 4G). The Forest Service soils assessment, which was completed in 2012, identified steep slopes and potentially unstable soils along a portion of the Proposed Route that crosses the Caribou-Targhee NF (in Sections 1 and 2, Township 12 South, Range 41 East). The Forest Service, therefore, identified an alternative route that avoids these areas (referred to as Alternative 4G). Alternative 4G is 2.6 miles long compared to 2.3 miles for the comparison portion of the Proposed Route, and moves a proposed fly-yard to a new location outside of the ROW (see Figure 2.4-3 in Chapter 2). The Forest Service's Preferred Route for the portion of Segment 4 within the Caribou Targhee NF is the Proposed Route with the inclusion of Alternative 4G. The Forest Service's Preferred Route for the ROW on the Caribou-Targhee NF would be 9.4 miles long and, using the Forest's GIS data, would impact a total of 307 acres of land (12 acres more than the comparison portion of the Proposed Route). This increase in the acreage of disturbance associated with the Forest Service Preferred Route is mostly related to increases in the amount of disturbance to mixed forests and juniper woodlands. Table 3.6-9 lists the acres of impact (by Project component) that would occur along the portion of the Proposed Route that would be located on the Caribou-Targhee NF, Alternative 4G, as well as the portion of the Proposed Route that would be comparable to Alternative 4G. This table uses the Forest's GIS vegetation data which are slightly different than the Project GIS data, tending to classify more acres as shrubland and fewer acres as forest land (and therefore, fewer acres with ROW clearing impacts). Therefore, totals presented in Table 3.6-9 are less than totals provided elsewhere (e.g., Tables 3.6-2 and Appendix D), which use the Project GIS data.

Table 3.6-9. Acres of Vegetation Impacts on the Caribou-Targhee National Forest

Segment	Project Components	Vegetation Type ^{1/}					Total
		Conifer Forest	Mixed Conifer/ Deciduous Forest	Deciduous Forest	Shrubland	Other	
Acres of Impact during Construction							
Segment 4 Proposed – Portion on the Caribou NF	Existing Road - Improved	14	2	2	3	<0.1	22
	Fly Yard	12	2	<0.1	11	–	25
	New Road	11	3	9	10	<0.1	33
	Pad - 500kV	14	6	9	17	1	47
	Pulling-Tensioning - 500kV (1-SC)	9	3	3	9	–	24
	ROW Clearing	85	13	46	–	–	144
Segment 4 Proposed Total		145	29	69	50	1	295
Segment 4 Proposed - Comparison portion for Alternative 4G	Existing Road - Improved	4	1	1	–	–	6
	New Road	1	<1	1	5	–	7
	Pad - 500kV	4	2	2	7	–	15
	ROW Clearing	17	4	5	–	–	26
	Segment 4 Comparison Portion Total	26	7	9	12	–	54
Alternative 4G	Deadend Pulling - 500kV (1-SC)	12	–	1	<1	–	14
	Existing Road - Improved	4	<1	<1	–	–	4
	New Road	5	–	3	9	–	17
	Pad - 500kV	4	–	2	9	–	15
	ROW Clearing	16	–	3	–	–	19
	Alternative 4G Total	41	<1	9	18	–	69
Total for the Forest Service Preferred Route on the Caribou-Targhee NF (which includes Alt. 4G)		160	22	69	56	1	307
Acres of Impact during Operation							
Segment 4 Proposed - Portion on the Caribou NF	Existing Road - Improved	4	1	1	1	<0.1	7
	New Road	4	1	3	3	<0.1	11
	Pad - 500kV	1	<1	<1	1	<0.1	2
	ROW	111	20	57	–	–	188
	Segment 4 Proposed Total	120	22	61	5	<0.1	208
Segment 4 Proposed - Comparison portion for Alternative 4G	Existing Road - Improved	1	<1	<1	–	–	2
	New Road	1	<1	<1	2	–	3
	Pad - 500kV	<1	<1	<1	<1	–	<1
	ROW	21	7	6	–	–	34
	Segment 4 Comparison Portion Total	23	8	7	2	–	39
Alternative 4G	Existing Road - Improved	1	<0.1	<1	–	–	1
	New Road	2	–	1	3	–	6
	Pad - 500kV	<1	–	<1	<1	–	<1
	ROW	23	–	4	–	–	27
	Alternative 4G Total	26	<0.1	5	3	–	34
Total for Forest Service Preferred Route on the Caribou-Targhee NF (which includes Alt. 4G)		123	15	60	6	<0.1	203

1/ Acreages were calculated using the Caribou-Targhee NF GIS database, which classifies vegetation differently than the Project GIS layer, with more acres identified as shrubland and fewer acres identified as forest land (thus also fewer ROW clearing acres). Therefore, total acreages presented here are less than in Table 3.6-2 and in Appendix D.

3.6-34

Operations

The impacts from operations of Segment 4 and its alternatives are presented in Table 3.6-10. During operations of the proposed Project along Segment 4, approximately 981 acres of vegetation would be permanently affected by Project features, of which 530 acres would be cleared for operations facilities and 451 acres of vegetation, located between structures along the ROW, would be maintained in an early seral stage.

Alternative 4F would have the greatest permanent effect on vegetation (288 acres), followed by Alternative 4D (287 acres), Alternative 4B (277 acres), Alternative 4E (275 acres), Alternative 4C (269 acres), and the comparison portion of the Preferred/Proposed Route (253 acres). Along Alternatives 4B to 4E, 87 percent or more of the vegetation affected would be shrubland, while Alternative 4F would affect 65 percent shrubland. However, Alternative 4F would permanently affect the most forest/woodland vegetation and the most wetland/riparian vegetation (Table 3.6-10).

Table 3.6-10. Comparison of Operations and Maintenance Vegetation Impacts (acres) for Segment 4

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Op. Fac. ^{3/}	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	
Preferred/Proposed Segment 4 – Total Length	421	25	446	9.3	5.1	14	60	981
Preferred/Proposed – Comparison Portion for Alts. 4B–F	186	3	38	4.4	2.3	7	12	253
Alternative 4B	246	<1	4	2.5	0.5	3	21	277
Alternative 4C	239	t ^{6/}	3	2.1	0.5	3	22	269
Alternative 4D	253	1	6	2.7	0.5	3	21	287
Alternative 4E	242	1	5	2.3	0.5	3	22	275
Alternative 4F	188	5	70	2.6	3.0	7	12	288

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Segment 5

The preferred routes in Segment 5 are as follows:

Preferred Route	Agency
Proposed Route incorporating Alternatives 5B and 5E ^{1/} (Figure A-7)	BLM
Proposed Route incorporating Alternatives 5C and 5E (Figure A-7)	Power County

1/ Assumes that Western Electricity Coordinating Council reliability issues associated with 5E are resolved.

Segment 5 would link the Populus and Borah Substations with a single-circuit 500-kV line that would be approximately 55.7 miles long. There are five Route Alternatives to portions of the Proposed Route in Segment 5. Alternatives 5A and 5B were proposed by the BLM to avoid crossing the Deep Creek Mountains. Alternative 5C, which crosses the Fort Hall Indian Reservation, was proposed as the preferred route by Power County; however, the Fort Hall Business Council has voted not to permit the Project across the

Reservation. Alternative 5D was originally the Proponents' Proposed Route. Alternative 5E was proposed by Power County as an alternative approach to the Borah Substation. The BLM has identified a Preferred Route that includes portions of the Proposed Route with Alternatives 5B and 5E (with the assumption that reliability issues associated with Alternative 5E can be resolved). The Segment 5 Preferred Route is 73.3 miles long, compared to 55.7 miles for the Proposed Route. Figure A-7 in Appendix A shows the location of the Segment 5 routes. Proposed Segment 5 and its alternatives cross an area of predominantly sagebrush, forest (deciduous, conifer, and juniper), and agriculture (Table D.6-1 in Appendix D).

Construction

The impacts from construction of Segment 5 and its alternatives are presented in Table 3.6-11. Construction of the Proposed Route and clearing of the ROW along Segment 5 would directly affect 1,461 acres for installation of the transmission line, primarily consisting of forest/ woodland vegetation (37 percent), shrubland (38 percent), and other cover types (agriculture; 21 percent). The Preferred Route would directly affect the most acres of vegetation, approximately 1,795 acres, 334 more than the Proposed Route; however, it would affect less woodland vegetation and a comparable amount of wetland/riparian vegetation than the Proposed Route (Table 3.6-11).

Table 3.6-11. Comparison of Construction-related Vegetation Impacts (acres) for Segment 5

Segment or Alternative	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Preferred Route Segment 5	776	178	243	6.3	1.0	89	501	1,795
Proposed Segment 5 – Total Length	560	260	283	6.4	–	52	300	1,461
Proposed – Comparison Portion for Alternative 5A,5B	204	161	140	<1	–	6	90	601
Alternative 5A	275	133	142	1.0	<1	70	166	786
Alternative 5B	436	81	103	1.3	1.0	45	279	947
Proposed – Comparison Portion for Alternative 5C	344	227	217	3.1	–	18	139	949
Alternative 5C	335	69	94	5.8	1.0	12	89	604
Proposed – Comparison Portion for Alternative 5D	246	69	81	4.3	–	16	149	565
Alternative 5D	152	83	74	2.4	1.2	15	164	491
Proposed – Comparison Portion for Alternative 5E	64	3	3	1.4	–	10	96	177
Alternative 5E	48	<1	–	<1	–	8	108	165

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

The comparison portion of the Proposed Route would result in less vegetation disturbance during construction (601 acres) than Alternative 5A (786 acres) and Alternative 5B (947 acres). Of the three routes, the comparison portion of the Proposed Route would affect the most forest/ woodland vegetation but the least acres of shrubland and wetland/riparian vegetation (Table 3.6-11). Alternative 5A would affect less vegetation than the Preferred Route, which includes 5B.

Alternative 5C would disturb less vegetation during construction than the comparison portion of the Proposed Route (604 acres and 949 acres, respectively) and less than the Preferred Route. The comparison portion of both the Preferred Route and Proposed Route would affect over twice as many acres of forest/woodland vegetation (nearly 85 percent of its total acreage) than Alternative 5C. The comparison portion of the Preferred/Proposed Route would affect less wetland/riparian vegetation than Alternative 5C (3 acres and 6 acres, respectively) but more shrubland (344 acres and 335 acres, respectively).

Alternative 5D would disturb less vegetation during construction than the Preferred Route and the comparison portion of the Proposed Route (491 acres and 565 acres, respectively). Impacts to wetland/riparian and forest/woodland vegetation would be comparable along both route segments. However, impacts to natural sagebrush would be greater under the comparison portion of the Proposed Route than Alternative 5D.

Alternative 5E (which is part of the Preferred Route) would disturb less vegetation during construction than the comparison portion of the Proposed Route (165 acres and 177 acres, respectively). The comparison portion of the Proposed Route would affect more forest/woodland, wetland/riparian, and natural sagebrush vegetation (Table D.6-2 in Appendix D) than Alternative 5E.

Operations

The impacts from operations of Segment 5 and its alternatives are presented in Table 3.6-12. During operations of the proposed Project along Segment 5 approximately 554 acres of vegetation would be permanently affected by the Project features, of which 169 acres of vegetation would be cleared for operations facilities and 385 acres of vegetation, located between structures along the ROW, would be maintained in an early seral stage. A majority (76 percent) of the operations impacts would occur in forest and woodlands, mainly due to vegetation management in the ROW. The Preferred Route would directly affect the fewest acres of vegetation (approximately 528 acres), 26 acres fewer than the Proposed Route. It would affect less woodland vegetation and a comparable amount of wetland/riparian vegetation than the Proposed Route (Table 3.6-12).

Alternative 5A would have greater permanent impacts on vegetation (268 acres) than the comparison portion of the Proposed Route and Alternative 5B (256 acres and 234 acres, respectively). Both alternatives require fewer acres of ROW maintenance within forested communities during operations than the Proposed Route. Alternative 5A would affect less vegetation than the Preferred Route, which includes 5B.

Table 3.6-12. Comparison of Operations-related Vegetation Impacts (acres) for Segment 5

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Op. Fac. ^{3/}	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	
Preferred Route Segment 5	126	22	325	0.6	1	6	47	528
Proposed Segment 5 – Total Length	100	36	385	0.6	–	5	27	554
Proposed – Comparison Portion for Alts. 5A,5B	27	23	197	t ^{6/}	–	1	8	256
Alternative 5A	37	20	188	<1	<1	5	18	268
Alternative 5B	53	9	141	<1	1.0	2	27	234
Proposed – Comparison Portion for Alternative 5C	46	32	303	0.6	–	2	14	396
Alternative 5C	35	10	130	<1	1.3	1	9	187
Proposed – Comparison Portion for Alternative 5D	39	9	111	0.5	–	1	13	175
Alternative 5D	28	6	103	<1	1.4	2	16	157
Proposed – Comparison Portion for Alternative 5E	16	t ^{6/}	4	t ^{6/}	–	<1	7	28
Alternative 5E	16	–	–	t ^{6/}	–	<1	8	24

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Alternative 5C and the comparison portion of the Proposed Route differ substantially in permanent vegetation impacts (187 acres and 396 acres, respectively). Thus, Alternative 5C also would have fewer impacts than the Preferred Route. This is because the comparison portion of the Proposed Route crosses more forested/woodland vegetation requiring vegetation maintenance within the ROW than Alternative 5C.

Alternative 5D would result in fewer permanent effects to vegetation than the Preferred Route and the comparison portion of the Proposed Route (157 acres and 175 acres, respectively). Alternative 5D would require a similar amount of forest/woodland vegetation that would be maintained within the ROW as the comparison portion of the Proposed Route. However, Alternative 5D would have a greater permanent effect on wetland/riparian vegetation than the comparison portion of the Proposed Route.

Alternative 5E (which is part of the Preferred Route) and the comparison portion of the Proposed Route would result in similar permanent effects to vegetation (24 acres and 28 acres, respectively). The comparison portion of the Proposed Route would have greater clearing of forest/ woodland vegetation within the ROW than Alternative 5E.

Segment 6

The BLM’s Preferred Route in Segment 6 is as follows:

Preferred Route	Agency
The proposal to upgrade the line voltage from 345-kV to 500-kV (Figure A-8)	BLM

Segment 6 is an existing transmission line linking the Borah and Midpoint Substations; it is now operated at 345 kV but would be changed to operate at 500 kV. This segment has no route alternatives. Existing support structures would be used and impacts would be limited to within approximately 0.25 mile from each substation to allow for moving the entry point into the substation to the new 500-kV bay. Changes at the Borah and Midpoint Substations would allow Segment 6 to be operated at 500 kV. Figure A-8 in Appendix A shows the Preferred/Proposed Route for Segment 6.

The impacts from construction and operations of Segment 6 are presented in Table 3.6-13. Construction of Segment 6 would impact about 65 acres of vegetation for installation of the transmission line, consisting of grassland, shrubland, and other cover types (disturbed/ developed); no additional acreage would be cleared for the ROW. Of these acres, 61 acres would be permanently impacted during operations.

Table 3.6-13. Acreage Affected by Construction and Operations of Segment 6

Segment or Alternative	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Fac. ^{3/}	Fac.	ROW	Fac.	ROW	Fac.	Fac.	
Preferred/Proposed Segment 6 – Total Length – Construction	17	–	–	–	–	26	22	65
Preferred/Proposed Segment 6 – Total Length – Operations and Maintenance	15	–	–	–	–	25	20	61

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

Segment 7

The preferred routes in Segment 7 are as follows:

Preferred Route	Agency
Proposed Route incorporating Alternatives 7B, 7C, 7D, and 7G (Figure A-9). The Proposed Route in the East Hills and Alternative 7G will be microsituated to avoid Preliminary Priority Sage-grouse Habitat (PPH).	BLM
Alternative 7K (Figure A-9)	Power and Cassia Counties

Segment 7 would link the Populus Substation and the proposed Cedar Hill Substation with a single-circuit 500-kV line that would be approximately 118.2 miles long. Several alternatives to the Proposed Route are being considered. Alternatives 7A and 7B have been proposed by the BLM to avoid crossing the Deep Creek Mountains. Alternatives 7C, 7D, 7E, 7F, and 7G were proposed by local landowners to avoid private agricultural lands. Alternative 7K (also called the Goose Creek Alternative) was identified during the

public comment period as a shorter alternative to the Proposed Route than either Alternatives 7I or 7J (refer to Chapter 2 of the Draft EIS for a description of these routes). The alignment for Alternative 7K was developed in cooperation with Cassia County. Alternatives 7H, 7I and 7J, which were analyzed in the Draft EIS, are no longer under consideration. The BLM has identified a Preferred Route that includes portions of the Proposed Route with Alternatives 7B, 7C, 7D, and 7G. The Segment 7 Preferred Route is 130.2 miles long, compared to 118.2 miles for the Proposed Route. Figure A-9 in Appendix A shows the location of the Segment 7 routes.

Segment 7 would cross an area of predominantly agriculture and sagebrush, with components of forest and woodland vegetation. The vegetation surrounding the Segment 7 alternatives is similar, although Alternatives 7C and 7G would not cross forest/woodland vegetation.

Construction

The impacts from construction of Segment 7 and its alternatives are presented in Table 3.6-14. Construction of the Proposed Route and clearing of the ROW along Segment 7 would directly affect 2,526 acres for installation of the transmission line, primarily consisting of other cover types (agriculture 36 percent, shrubland 33 percent, and forest/ woodland vegetation 20 percent). The Preferred Route would directly affect the most vegetation (approximately 2,748 acres), 222 acres more than the Proposed Route. The Preferred Route would affect less forest/woodland vegetation, but slightly more wetland/riparian vegetation (Table 3.6-14).

Table 3.6-14. Comparison of Construction-related Vegetation Impacts (acres) for Segment 7

Segment or Alternative	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Preferred Route Segment 7	1,043	151	194	8.1	0	342	1,010	2,748
Proposed Segment 7 – Total Length	838	242	274	6.1	–	248	918	2,526
Proposed – Comparison Portion for Alternative 7A,7B	291	155	158	0.9	–	33	173	810
Alternative 7A	377	150	150	8.6	<1	48	190	925
Alternative 7B	521	64	79	1.5	–	22	312	999
Proposed – Comparison Portion for Alt. 7C	182	–	–	<1	–	28	162	372
Alternative 7C	148	–	–	–	–	115	99	362
Proposed – Comparison Portion for Alt. 7D	42	3	6	3.6	–	34	49	138
Alternative 7D	47	3	5	3.9	–	47	53	158
Proposed – Comparison Portion for Alt. 7E	37	4	10	–	–	17	14	82
Alternative 7E	53	9	17	–	–	19	14	113
Proposed – Comparison Portion for Alt. 7F	69	45	58	<1	–	45	66	283
Alternative 7F	80	50	61	<1	–	45	38	275

Table 3.6-14. Comparison of Construction-related Vegetation Impacts (acres) for Segment 7 (continued)

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Proposed – Comparison Portion for Alt. 7G	49	–	–	1 ^{6/}	–	2	14	64
Alternative 7G	53	–	–	1.1	–	7	26	87
Proposed – Comparison Portion for Alt. 7K	837	242	274	6.0	–	248	916	2,523
Alternative 7K	1,608	419	600	15.1	1.3	446	371	3,461

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Alternatives 7A and 7B (which is part of the Preferred Route) would have greater impacts to vegetation during construction (925 acres and 999 acres, respectively) than the comparison portion of the Proposed Route (810 acres). Alternative 7B would have the greatest effect on shrubland vegetation, followed by Alternative 7A, and the comparison portion of the Proposed Route, respectively (Table D.6-2 in Appendix D). The comparison portion of the Proposed Route would have the greatest effect on forest/woodland vegetation, followed by Alternative 7A and Alternative 7B, respectively. Finally, Alternative 7A would have the greatest effect on wetland/riparian vegetation, followed by Alternative 7B and the comparison portion of the Proposed Route, respectively.

Alternative 7C (which is part of the Preferred Route) and the comparison portion of the Proposed Route would impact a comparable amount of vegetation (362 acres and 372 acres, respectively). Alternative 7C would impact more grassland (all of which is disturbed), and the comparison portion of the Proposed Route would impact more shrubland vegetation (Table D.6-2 in Appendix D).

Alternative 7D (which is part of the Preferred Route) would impact more vegetation than the comparison portion of the Proposed Route (158 acres and 138 acres, respectively). Impacts to individual vegetation types are comparable between the segments, with Alternative 7D affecting more shrubland, grassland and other cover types (Table 3.6-14).

Alternative 7E would result in a greater amount of construction disturbance than the comparison portion of the Proposed Route (113 and 82 acres, respectively) and the Preferred Route. Alternative 7E would affect more forest and woodland and shrubland vegetation than the comparison portion of the Proposed Route.

Alternative 7F would impact fewer acres of vegetation than the comparison portion of the Proposed Route (275 acres and 283 acres, respectively) and the Preferred Route. Alternative 7F would impact more forest/woodland vegetation and shrubland than the comparison portion of the Proposed Route.

Alternative 7G (which is part of the Preferred Route) would affect more vegetation during construction than the comparison portion of the Proposed Route (87 acres and 64 acres, respectively); however, much of the acreage affected by Alternative 7G includes previously disturbed shrublands, disturbed grasslands, and agriculture (Table D.6-2 in Appendix D).

Alternative 7K would affect more vegetation during construction than the comparison portion of the Proposed Route (3,461 acres and 2,523 acres, respectively) and the Preferred Route. Alternative 7K would impact more shrubland and forest and woodland than the comparison portion (Table 3.6-14).

Sawtooth National Forest Crossed by Segment 7

Alternative 7K would cross the Sawtooth NF, impacting a total of 398 acres of vegetation within the NF during construction (Table D.6-5 in Appendix D). Of these, 264 acres are forest and woodland. The comparison portion would not cross the Sawtooth NF. Although GIS data from the Sawtooth NF do not include information on forest age class or seral stage, Alternative 7K would impact approximately 15 acres of trees during construction that possess potential mature forest characteristics (moderate 41-70 percent canopy cover with trees between 12 and 20 inches diameter at breast height).

Operations

The impacts from operations and maintenance of Segment 7 and its alternatives are presented in Table 3.6-15. A total of 630 acres of vegetation would be permanently affected by the Segment 7 Proposed Route, of which 265 acres of vegetation would be cleared for operations facilities and 365 acres of vegetation, located along the ROW between structures, would be maintained in early seral stage. The Preferred Route would impact the least vegetation during operations (approximately 45 acres), 85 acres less than the Proposed Route (Table 3.6-15).

Alternative 7A would have the greatest total permanent impacts to vegetation (302 acres), followed by the comparison portion of the Proposed Route (280 acres), and Alternative 7B (202 acres), which is part of the Preferred Route, respectively. Alternative 7A would require the same maintenance of forest/ woodland vegetation as the comparison portion of the Proposed Route, whereas Alternative 7B (which is part of the Preferred Route) would require less maintenance than the comparison portion.

Alternative 7C (which is part of the Preferred Route) would have fewer total permanent impacts on vegetation than the comparison portion of the Proposed Route (28 acres and 36 acres, respectively). Alternative 7C would impact fewer acres of shrubland than the comparison portion.

Alternative 7D (which is part of the Preferred Route) would have similar permanent effects on vegetation as the comparison portion of the Proposed Route (20 acres and 19 acres, respectively). Vegetation types affected would also be similar.

Alternative 7E would have greater permanent effects on vegetation than the comparison portion of the Proposed Route (30 acres and 18 acres, respectively) and the Preferred Route. Alternative 7E would also permanently disturb more forest/ woodland vegetation than the comparison portion.

Table 3.6-15. Comparison of Operations-related Vegetation Impacts (acres) for Segment 7

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Op. Fac. ^{3/}	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	
Preferred Route Segment 7	133	22	262	<1	–	25	103	545
Proposed Segment 7 – Total Length	112	35	365	<1	–	22	96	630
Proposed – Comparison Portion for Alternative 7A,7B	29	23	208	<1	–	3	16	280
Alternative 7A	46	23	208	0.6	<1	4	19	302
Alternative 7B	59	10	106	<1	–	<1	27	202
Proposed – Comparison Portion for Alternative 7C	21	–	–	t ^{6/}	–	3	12	36
Alternative 7C	13	–	–	–	–	8	7	28
Proposed – Comparison portion for Alternative 7D	4	<1	8	t ^{6/}	–	4	3	19
Alternative 7D	4	<1	7	t ^{6/}	–	5	3	20
Proposed – Comparison Portion for Alternative 7E	3	<1	13	–	–	1	<1	18
Alternative 7E	6	1	22	–	–	2	<1	30
Proposed – Comparison Portion for Alternative 7F	7	5	81	t ^{6/}	–	4	7	103
Alternative 7F	8	5	85	t ^{6/}	–	5	5	109
Proposed – Comparison Portion for Alternative 7G	4	–	–	t ^{6/}	–	<1	2	6
Alternative 7G	3	–	–	t ^{6/}	–	<1	3	6
Proposed – Comparison Portion for Alternative 7K	112	35	365	<1	–	22	96	629
Alternative 7K	225	54	790	2.1	1.4	37	63	1,173

1/ "Shrublands" include sagebrush, saltbush, greasewood, disturbed shrub, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Alternative 7F would have effects on vegetation similar to the comparison portion of the Proposed Route (109 acres and 103 acres, respectively) and the Preferred Route. Effects to particular vegetation types would also be similar.

Alternative 7G (which is part of the Preferred Route) would have similar effects on vegetation as the comparison portion of the Proposed Route (6 acres). Effects to particular vegetation types would also be similar.

Alternative 7K would have greater total permanent impacts on vegetation than the comparison portion of the Proposed Route (1,173 acres and 629 acres, respectively) and the Preferred Route. Alternative 7K would impact a greater number of shrubland, forested/woodland, wetland/riparian, and grassland vegetation types than the comparison portion of the Proposed Route.

Segment 8

The preferred routes in Segment 8 are as follows:

Preferred Route	Agency
Proposed Route incorporating Alternative 8B (Figure A-10)	BLM and IDANG

Segment 8 would link the Midpoint and Hemingway Substations. This 131.5-mile single-circuit 500-kV transmission line would stay north of the Snake River generally parallel to an existing 500-kV transmission line, before ending at the Hemingway Substation. There are five Route Alternatives to the Proposed Route. Alternative 8A follows the WWE corridor but crosses the Snake River and I-84 twice (while the Proposed Route would stay north of this area). Alternatives 8B and 8C were originally proposed by the Proponents as parts of the Proposed Route but were later dropped from the Proposed Route to avoid planned developments near the cities of Kuna and Mayfield, respectively. Alternative 8D would rebuild a portion of an existing 500-kV transmission line to move it away from the National Guard Maneuver Area. Alternative 8D would be constructed within the ROW currently occupied by the existing line. Alternative 8E was proposed by the BLM in order to avoid crossing the Halverson Bar non-motorized portion of a National Register Historic District (see the discussion of 8E under Segment 9). The BLM has identified a Preferred Route that includes portions of the Proposed Route with Alternative 8B and generally avoids the SRBOP. The Segment 8 Preferred Route is 132.0 miles long, compared to 131.5 miles for the Proposed Route. Figure A-10 in Appendix A shows the location of the Segment 8 routes. Proposed Segment 8 and its alternatives would cross an area consisting of agriculture, disturbed grassland and sagebrush, and sagebrush (Table D.6-1 in Appendix D).

Construction

The impacts from construction of Segment 8 and its alternatives are presented in Table 3.6-16. Construction of the Proposed Route along Segment 8 would directly affect 2,518 acres for installation of the transmission line, primarily consisting of shrubland (56 percent) and grassland (31 percent). The Preferred Route would impact slightly more vegetation (approximately 17 acres more), impacting less shrubland vegetation and more wetland/riparian, grassland, and other cover types (Table 3.6-16).

Alternative 8A would disturb more vegetation during construction than the comparison portion of the Proposed Route (983 acres and 963 acres, respectively) and the Preferred Route. Alternative 8A would disturb more agricultural lands than the comparison portion of the Proposed Route as well as more wetland/riparian vegetation within the ROW.

Alternative 8B (which is part of the Preferred Route) would also disturb more vegetation during construction than the comparison portion of the Proposed Route (916 acres and 899 acres, respectively). Alternative B would impact more wetland/riparian vegetation than the comparison portion of the Proposed Route (Table D.6-2 in Appendix D).

Table 3.6-16. Comparison of Construction-related Vegetation Impacts (acres) for Segment 8

Segment or Alternative	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian ^{3/}		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Preferred Route Segment 8	1,287	–	–	16	<1	647	586	2,535
Proposed Segment 8 – Total Length	1,404	–	–	8.9	t ^{6/}	786	320	2,518
Proposed – Comparison Portion for Alternative 8A	530	–	–	2.1	t ^{6/}	177	253	963
Alternative 8A	451	–	–	2.2	4.8	185	339	983
Proposed – Comparison Portion for Alternative 8B	479	–	–	1.0	–	365	54	899
Alternative 8B	362	–	–	7.9	<1	226	320	916
Proposed – Comparison Portion for Alternative 8C	86	–	–	<1	–	74	3	163
Alternative 8C	55	–	–	t ^{6/}	–	68	17	140
Proposed – Comparison Portion for Alternative 8D	11	–	–	t ^{6/}	–	130	7	147
Alternative 8D	7	–	–	t ^{6/}	–	141	25	174
Proposed – Comparison Portion for Alternative 8E	65	–	–	–	–	47	13	124
Alternative 8E	229	–	–	<1	–	98	7	334

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Alternative 8C would disturb less vegetation during construction than the comparison portion of the Proposed Route (140 acres and 163 acres, respectively) and the Preferred Route. Alternative 8C would impact more other cover types whereas the comparison portion of the Proposed Route would impact more shrubland.

Alternative 8D would disturb more vegetation during construction than the comparison portion of the Proposed Route (174 acres and 147 acres, respectively) and the Preferred Route, mostly consisting of disturbed grassland and agriculture (Table D.6-2 in Appendix D).

Alternative 8E would disturb more vegetation during construction than the comparison portion of the Proposed Route (334 and 124 acres, respectively) and the Preferred Route, consisting of disturbed sagebrush and grassland (Table D.6-2 in Appendix D).

Operations

The impacts from operations of Segment 8 and its alternatives are presented in Table 3.6-17. During operations of the Proposed Route along Segment 8, approximately 249 acres of vegetation would be permanently impacted. Much of the vegetation affected consists of disturbed grasslands and disturbed shrublands (Table D.6-3 in Appendix D). The Preferred Route would directly affect the fewest acres during operations (231 acres), 18 acres fewer than the Proposed Route. Neither the Proposed Route nor the Preferred Route would affect forest/woodland vegetation, and both would have negligible (less than 1 acre) effects to wetland/riparian vegetation.

Table 3.6-17. Comparison of Operations-related Vegetation Impacts (acres) for Segment 8

Segment or Alternative	Shrubland ^{1/}	Forest/Woodland ^{2/}		Wetland/Riparian		Grassland	Other Cover Types ^{4/}		Total ^{5/}
	Op. Fac. ^{3/}	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	ROW		
Preferred Route Segment 8	130	–	–	0.7	<1	64	36	231	
Proposed Segment 8 – Total Length	144	–	–	0.7	t ^{6/}	76	28	249	
Proposed – Comparison Portion for Alternative 8A	60	–	–	<1	t ^{6/}	22	20	102	
Alternative 8A	47	–	–	<1	5.5	28	27	108	
Proposed – Comparison Portion for Alternative 8B	49	–	–	<1	–	31	7	87	
Alternative 8B	35	–	–	<1	<1	19	15	69	
Proposed – Comparison Portion for Alternative 8C	9	–	–	t ^{6/}	–	6	<1	15	
Alternative 8C	6	–	–	t ^{6/}	–	9	1	16	
Proposed – Comparison Portion for Alternative 8D	1	–	–	–	–	12	2	15	
Alternative 8D	1	–	–	–	–	11	4	15	
Proposed – Comparison Portion for Alternative 8E	6	–	–	–	–	3	1	10	
Alternative 8E	19	–	–	–	–	7	<1	26	

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Op. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Alternative 8A and the comparison portion of the Proposed Route would have comparable permanent impacts to vegetation (109 acres and 102 acres, respectively). However, Alternative 8A would impact more wetland/riparian vegetation than the comparison portion of the Proposed Route, much of this due to vegetation maintenance in the ROW. Alternative 8A would affect a comparable amount of vegetation to the Preferred Route, but would affect more wetland/riparian vegetation.

Alternative 8B (which is part of the Preferred Route) would have fewer permanent effects to vegetation than the comparison portion of the Proposed Route (69 acres and 87 acres, respectively). The comparison portion of the Proposed Route would permanently impact more shrubland and grassland vegetation, whereas Alternative 8B would impact more agriculture (Table D.6-3 in Appendix D).

Alternative 8C would have similar permanent effects to vegetation as the comparison portion of the Proposed Route (16 acres and 15 acres, respectively) and the Preferred Route. All of these routes would primarily impact shrubland and grassland vegetation.

Alternative 8D would have similar permanent effects to vegetation as the comparison portion of the Proposed Route (15 acres) and the Preferred Route. All of these routes would primarily impact grassland vegetation.

Alternative 8E would have a greater permanent effect to vegetation than the comparison portion of the Proposed Route (26 acres and 10 acres, respectively) and the Preferred Route. All of these routes would primarily impact shrubland and grassland vegetation.

Segment 9

The preferred routes in Segment 9 are as follows:

Preferred Route	Agency
Proposed Route incorporating Alternative 9E, which was revised to avoid PPH and Murphy (Figure A-11)	BLM
Alternative 9D (Figure A-11)	Owyhee County

Segment 9 would link the Cedar Hill and Hemingway Substations with a 162.2-mile single-circuit 500-kV transmission line that skirts the Jarbidge and Owyhee Military Operating Areas to the north, then follows the WWE corridor just north of the Saylor Creek Air Force Range, passing through Owyhee County before entering the Hemingway Substation. There are eight Route Alternatives proposed. Alternative 9A was the Proponents’ Proposed Route until that route was revised to avoid the Hollister area. Alternative 9B is being considered by the BLM because it follows the WWE corridor and parallels existing utility corridors. Alternative 9C was the Proponents’ Proposed Route until that route was revised to avoid the Castleford area. Alternatives 9D through 9G were proposed by the Owyhee County Task Force to reduce impacts to private land. Alternatives 9F and 9H were proposed to avoid crossing the non-motorized area south of C.J. Strike Reservoir and as an alternate route if Alternative 8E is selected. The BLM has identified a Preferred Route that includes portions of the Proposed Route with Alternative 9E. Figure A-11 in Appendix A shows the location of the Segment 9 routes. A portion of Alternative 9D/F uses the same path as Alternative 8E in Segment 8; therefore, 8E and 9D/F could not both be selected. Alternative 9E has been revised to avoid sage-grouse PPH and to incorporate a recommended route change submitted by Owyhee County that avoids a planned subdivision near Murphy.

The Segment 9 Preferred Route is 171.4 miles long, compared to 162.2 miles for the Proposed Route.

The Segment 9 Proposed Route and Route Alternatives cross an area consisting of both natural and disturbed shrubland with a small agricultural component (Table D.6-1 in Appendix D).

Construction

The impacts from construction of the Segment 9 Proposed Route and Route Alternatives are presented in Table 3.6-18. Construction of the Proposed Route and clearing of the ROW along Segment 9 would directly affect 3,294 acres for installation of the transmission line, primarily consisting of shrubland (46 percent) and grassland (39 percent). Potentially sensitive vegetation crossed by Segment 9 includes natural sagebrush, native grassland, and a small amount of wetland/riparian vegetation (Table D.6-2 in Appendix D). The Preferred Route would affect the most vegetation (approximately 3,352 acres), 58 acres more than the Proposed Route; however, it would affect slightly less wetland/riparian vegetation than the Proposed Route and a comparable amount of forest/woodland vegetation (Table 3.6-18).

Table 3.6-18. Comparison of Construction-related Vegetation Impacts (acres) for Segment 9

Segment or Alternative	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Const. Fac. ^{3/}	Const. Fac.	ROW	Const. Fac.	ROW	Const. Fac.	Const. Fac.	
Preferred Route Segment 9	1,747	1	1	3	–	1,340	261	3,352
Proposed Segment 9 – Total Length	1,506	1	1	6.0	t ^{6/}	1,288	493	3,294
Proposed – Comparison Portion for Alternative 9A	57	–	–	<1	–	71	19	1467
Alternative 9A	98	–	–	<1	–	45	19	162
Proposed – Comparison Portion for Alternative 9B	403	1	1	<1	–	558	75	1,037
Alternative 9B	297	–	–	<1	<1	428	240	965
Proposed – Comparison Portion for Alternative 9C	128	1	1	<1	–	156	20	305
Alternative 9C	80	–	–	–	–	154	86	320
Proposed – Comparison Portion for Alts. 9D,F,G,H	663	–	–	5.1	–	216	261	1,145
Alternative 9D	472	1	1	2.6	–	516	56	1,048
Alternative 9F	551	–	–	6.7	–	433	174	1,165
Alternative 9G	503	1	1	4.0	–	486	65	1,059
Alternative 9H	579	–	–	7.3	–	403	174	1,163
Proposed – Comparison Portion for Alternative 9E (revised)	750	–	–	5.1	–	215	262	1,232
Alternative 9E (revised)	991	–	–	2.5	–	267	30	1,290

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Const. Fac. = clearing for facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

Alternative 9A would impact more vegetation during construction than the comparison portion of the Proposed Route (162 acres and 147 acres, respectively); however, Alternative 9A would disturb more shrubland (76 percent of which is previously disturbed; Table D.6-2 in Appendix D), whereas the Proposed Route and the Preferred Route would disturb more grassland (all of which is disturbed).

Alternative 9B would impact less vegetation disturbance during construction than the comparison portion of the Proposed Route (965 acres and 1,037 acres, respectively) and the Preferred Route. The comparison portion of the Proposed Route would affect more shrubland and grassland than Alternative 9B; effects to wetland/riparian vegetation would be similar between the routes (Table D.6-2 in Appendix D).

Alternative 9C would result in more vegetation disturbance during construction than the comparison portion of the Proposed Route (320 acres and 305 acres, respectively) and the Preferred Route. The comparison portion of the Proposed Route would impact a greater amount of sagebrush vegetation, whereas Alternative 9C would impact more agriculture (Table D.6-2 in Appendix D).

Alternative 9F would result in the greatest amount of vegetation disturbance during construction (1,165 acres), followed by Alternative 9H (1,163 acres), the comparison portion of the Proposed Route (1,145 acres), Alternative 9G (1,059 acres), and Alternative 9D (1,048 acres). Minor impacts to forest/woodland would occur under Alternatives 9D and 9G. Impacts to wetland/riparian would be greatest under Alternatives 9F and 9H. Alternatives 9F and 9H would impact more vegetation than the Preferred Route, including more wetland/riparian vegetation, whereas Alternatives 9G and 9D would impact less vegetation than the Preferred Route.

Alternative 9E (revised), which is part of the Preferred Route, would result in more vegetation disturbance during construction than the comparison portion of the Proposed Route (1,290 acres and 1,232 acres, respectively). Alternative 9E (revised) would impact a greater amount of shrub vegetation and grassland than the comparison portion of the Proposed Route.

Operations

The impacts from operations of Segment 9 and its alternatives are presented in Table 3.6-19. During operations of the proposed Project along Segment 9, approximately 361 acres would be permanently impacted, consisting primarily of shrubland and grassland vegetation. The Preferred Route would affect the most vegetation during operations (approximately 380 acres), 19 acres more than the Proposed Route, consisting of shrubland and grassland vegetation.

Alternative 9A and the comparison portion of the Proposed Route would have similar permanent impacts to vegetation (14 acres and 15 acres, respectively). Alternative 9B would have fewer permanent impacts to vegetation than the comparison portion of the Proposed Route (84 acres and 123 acres, respectively). Both routes primarily impact shrubland and grassland. Alternative 9C and the comparison portion of the Proposed Route would have comparable impacts to vegetation (26 acres and 28 acres, respectively), also both primarily impacting shrubland and grassland. Alternatives 9A and 9C would have impacts comparable to the Preferred Route, whereas Alternative B would have fewer impacts than the Preferred Route.

Table 3.6-19. Comparison of Operations-related Vegetation Impacts (acres) for Segment 9

Segment or Alternative	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Op. Fac. ^{3/}	Op. Fac.	ROW	Op. Fac.	ROW	Op. Fac.	Op. Fac.	
Preferred Route Segment 9	199	t ^{6/}	1	0.2	t ^{6/}	147	32	380
Proposed Segment 9 – Total Length	172	t ^{6/}	1	0.9	t ^{6/}	139	47	361
Proposed – Comparison Portion for Alternative 9A	6	–	–	t ^{6/}	–	8	2	15
Alternative 9A	8	–	–	t ^{6/}	–	4	2	14
Proposed – Comparison Portion for Alternative 9B	53	t ^{6/}	1	t ^{6/}	–	65	4	123
Alternative 9B	31	–	–	t ^{6/}	<1	37	16	84
Proposed – Comparison Portion for Alternative 9C	13	t ^{6/}	1	t ^{6/}	–	11	3	28
Alternative 9C	9	–	–	–	–	11	6	26
Proposed – Comparison Portion for Alternatives 9D,F,G,H	70	–	–	0.9	–	16	19	106
Alternative 9D	40	t ^{6/}	1	t ^{6/}	–	38	6	85
Alternative 9F	47	–	–	0.6	–	33	13	93
Alternative 9G	42	t ^{6/}	1	<1	–	37	7	88
Alternative 9H	49	–	–	0.8	–	33	14	96
Proposed – Comparison Portion for Alternative 9E (revised)	80	–	–	0.9	–	16	19	116
Alternative 9E (revised)	107	–	–	0.2	–	24	4	135

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Op. Fac. = clearing for operations facilities such as infrastructure and roads; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.

6/ Value is less than 0.1 acre.

The comparison portion of the Proposed Route would have the greatest permanent impacts to vegetation (106 acres), followed by Alternative 9H (96 acres), Alternative 9F (93 acres), Alternative 9G (88 acres), and Alternative 9D (85 acres). Alternatives 9H, 9F, 9G, and 9D would have fewer impacts than the Preferred Route. Alternatives 9D and 9G would require a minor amount of forest/woodland vegetation maintenance within the ROW (1 acre along each). All segments would result in the removal of a minor amount of wetland/riparian vegetation.

Alternative 9E (revised), which is part of the Preferred Route, would result in more vegetation disturbance during operations than the comparison portion of the Proposed Route (135 acres and 116 acres, respectively). Alternative 9E (revised) would also have a greater impact on sagebrush and grassland vegetation than the comparison portion of the Proposed Route.

Segment 10

The BLM's Preferred Route in Segment 10 is as follows:

Preferred Route	Agency
Proposed Route (Figure A-12)	BLM

Segment 10 would link the Cedar Hill and Midpoint Substations with a 34.4-mile single-circuit 500-kV line. Segment 10 would follow a WWE corridor for most of the route. The Preferred/Proposed Route would also be adjacent to the existing 345-kV line most of this length and has been sited to follow the same alignment of the planned SWIP. Either the SWIP or Gateway West would be built, but not both. There are no Route Alternatives proposed along this segment. Figure A-12 in Appendix A shows the location of the Preferred/Proposed Route in Segment 10.

Construction

The impacts from construction of Segment 10 are presented in Table 3.6-20. Construction of the Preferred/Proposed Route and clearing of the ROW along Segment 10 would directly affect 671 acres for installation of the transmission line, primarily consisting of other cover types (mostly agriculture), disturbed grassland, and shrubland (Table D.6-2 in Appendix D).

Operations

The impacts from operations of Segment 10 and its alternatives are presented in Table 3.6-20. During operations of the Preferred/Proposed Route along Segment 10, approximately 74 acres would be permanently disturbed by Project features. Vegetation impacted would consist of other cover types (primarily agriculture), grassland, and shrubland.

Table 3.6-20. Summary of Construction- and Operations-related Vegetation Impacts (acres) for Segment 10

Segment or Alternative	Shrubland ^{1/}	Forest/ Woodland ^{2/}		Wetland/ Riparian ^{3/}		Grassland	Other Cover Types ^{4/}	Total ^{5/}
	Fac. ^{3/}	Fac.	ROW	Fac.	ROW	Fac.	Fac.	
Preferred/Proposed Segment 10 – Total Length – Construction	146	–	–	0.8	–	174	349	671
Preferred/Proposed Segment 10 – Total Length – Operations and Maintenance	13	–	–	<1	–	16	44	74

1/ "Shrublands" include sagebrush, saltbush, greasewood, and dwarf shrub.

2/ "Forest/woodlands" include conifer and deciduous forest and juniper woodlands.

3/ Fac. = clearing for construction or operation facilities such as infrastructure, roads, temporary multipurpose yards, and fly yards; ROW = right-of-way clearing

4/ "Other Cover Types" include agriculture, disturbed/developed, water, areas with no vegetation data, and "miscellaneous" (substrate dominated).

5/ Numbers in table are inexact; columns or rows may not sum exactly due to rounding, including the totals row/column.