Chapter 20 Climate

This chapter describes existing climate conditions in the project area, and how the project alternatives could affect or be affected by climate conditions.

Words in **bold** and acronyms are defined in Chapter 32, Glossary and Acronyms.

20.1 Affected Environment

The term "climate" includes temperature, humidity, atmospheric pressure, wind, rainfall, fog and snow, atmospheric particulate concentration, and other meteorological elements, in a given region over long periods of time. Climate can be contrasted to "weather," which is the present condition of these same elements and their variations over shorter periods.

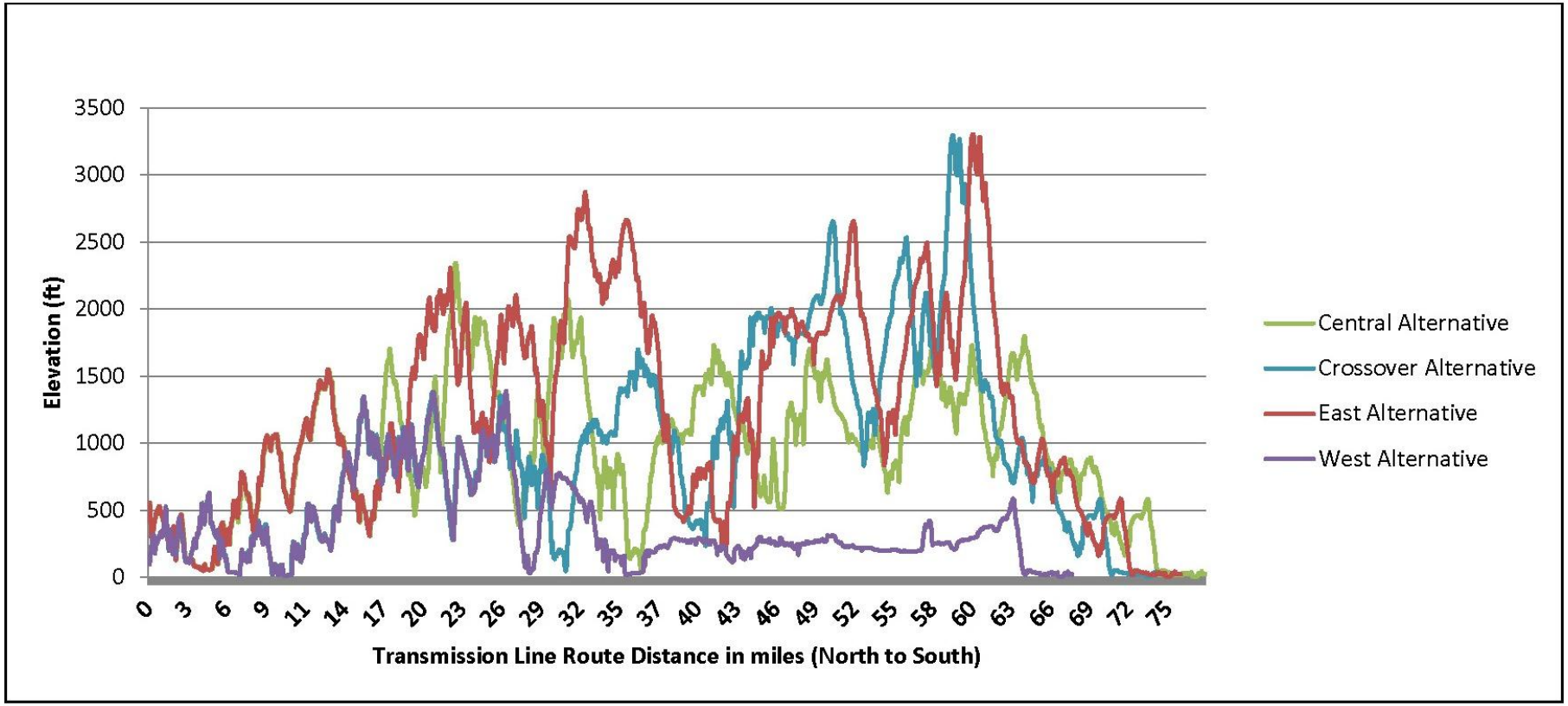
The Columbia River Valley, the Cascade Mountain Range, and the western foothills of the Cascade Mountains have a major influence on weather patterns in the project area.

The Columbia River Gorge provides an open passage between the Washington and Oregon Cascades that allows an exchange of air between the eastern and western parts of each state. The direction and speed of air movement through the Gorge is determined primarily by the pressure gradient between the eastern and western slopes of the mountains. In summer, the flow of air is usually from west to east, caused by rising air masses in the heat of eastern Oregon and Washington, and in winter from east to west, as low pressure winter storms come in from the Pacific Ocean. During the winter season, easterly winds in the Gorge sometimes reach gale force. Severe ice storms or "silver thaws," as they are frequently called, occur in a narrow area westward from the Gorge to the Vancouver, Washington area. Silver thaws are caused by rain falling through a layer of cold dry air flowing westward through the Gorge from sub-freezing conditions in eastern Washington.

Climate elements in the project area include precipitation (i.e., rain, snow), temperature, wind, fog, and severe storms. These elements can vary across the project area and between the lower elevations in the valleys and the higher elevations in the western foothills of the Cascade Range. In general, the likelihood of severe climatic conditions increases toward the higher-elevation eastern part of the project area, where portions of the East Alternative and East Option 2 routes and the southern part of the Central and Crossover alternatives and options are located. Some parts of the East and Crossover alternatives would be above 3,000 feet (see Figure 20-1).

The eastern parts of the project area get about 71 inches of snow and over 85 inches of rain each year. The higher elevations in the western foothills of the Cascade Range are also exposed to high winds, more heavy fog conditions, and frequent temperatures below 32°F during winter. The western parts of the project area are lower (less than 200 feet above mean sea level) and have a more moderate climate. About 46 inches of rain and less than 5 inches of snow occur each year, with only a few days with temperatures below 32°F. The lower elevations also have fewer heavy fog days and low winds relative to the higher elevations.

Figure 20-1 Elevation Comparison of the Action Alternatives



20.2 Environmental Consequences

General impacts that would occur for the action alternatives are discussed below. Impacts would be similar for all action alternatives.

20.2.1 Impact Levels

Impacts would be **high** where project activities would cause the following:

- Long-term, macro-scale changes in physical parameters occur to the local or regional climate.

Impacts would be **moderate** where project activities would cause the following:

- Long-term **micro-climate** changes in physical parameters occur to the local climate.

Impacts would be **low** where project activities would cause the following:

- Short-term, micro-climate changes in physical parameters occur to the local climate
- Short-term interruption of construction, operation, and maintenance of the transmission line due to climate could occur, but could be mitigated

No impact would occur where there would be no change in local or regional climate from the transmission line and where climatic conditions would not interrupt construction, operation, or maintenance of the transmission line.

20.2.2 Impacts Common to Action Alternatives

Climate could be directly affected by long-term, large-scale changes in physical parameters such as **transpiration** (loss of water vapor from parts of plants), **albedo** (solar reflectivity of the earth's surface), or changes in topography and atmospheric composition. The proposed project's effect on transpiration would be tiny on the climate scale because project activities that could affect the existing amount of transpiration (i.e., clearing of vegetation) occur in an area representing only a tiny fraction of the total amount of vegetation in the region (see Chapter 17, Vegetation, for acreages of vegetation that would be cleared under each alternative). In addition, although the project would clear taller growing vegetation within the right-of-way and danger trees outside of the right-of-way, areas in the right-of-way between towers and around the towers themselves would continue to support low-growing vegetation or be reseeded with a native plant mix. Beyond the right-of-way, trees would be allowed to grow back. The extremely small footprint of the project on the earth's surface also would not significantly alter solar reflectivity of the earth, causing no effects related to albedo. Finally, the project would cause only relatively minimal changes in topography at locations where minor grading is required, and would not create emissions that would affect overall, long-term atmospheric composition. For these reasons, **no** impact to climate would occur from the action alternatives.

Climate may have a direct effect on construction as well as ongoing operation and maintenance activities. Wind, rain, ice, or fog could prevent construction equipment from accessing the right-of-way, particularly in areas at higher elevations along the East Alternative and East Option

2 and parts of the Central and Crossover alternatives and options (see Figure 20-1). During operation of the project, snow and ice loading (including silver thaw events) and wind loading could add forces to and increase the stresses on transmission lines, towers, and tower foundations. Snow, ice, fog, rain, or wind could also accelerate the degradation of access roads, requiring increased maintenance. These impacts would be **low** because transmission facilities would be engineered and designed for climate conditions in the project area. Construction and maintenance activities would be scheduled to take advantage of seasonal weather conditions, if possible.

20.2.3 Recommended Mitigation Measures

Mitigation measures included as part of the project are identified in Table 3-2. The following additional mitigation measure is recommended to further reduce or eliminate adverse impacts from climate on the project.

- Schedule construction and maintenance activities by seasonal accessibility

20.2.4 Unavoidable Impacts

No unavoidable impacts to climate have been identified. Unavoidable impacts from climate on the project could include delayed or otherwise changed construction schedules, or delayed access to transmission facilities during operation and maintenance.

20.2.5 No Action Alternative

The No Action Alternative would have **no** impact to or from climate because no new transmission lines, substations, or access roads would be constructed. Operation and maintenance of existing lines, substation, and roads would continue to occur, and climate elements would continue to have impacts on these facilities and activities.