

Chapter 5 Land

This chapter describes existing land ownership and use in the project area, and how the project alternatives could affect these resources. Related information can be found in Chapters 6 through 22, which discuss individual resources on this land such as visual, recreation, cultural, soil, wetland, vegetation, wildlife, or air quality.

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

5.1 Affected Environment

For the purposes of this analysis, the project area consists of lands at and in the immediate vicinity of proposed project facilities in Cowlitz and Clark counties, Washington, and Multnomah County, Oregon. This includes the unincorporated portions of these counties and the city of Kelso in Cowlitz County, the cities of Vancouver, Camas, and Washougal in Clark County, and the cities of Troutdale and Fairview in Multnomah County. This section describes existing general land ownership and use patterns in the project area, followed by more specific descriptions of land ownership and use along each of the proposed action alternatives.

5.1.1 Land Ownership

While there is a wide variety of land ownership in the general project area, land along the action alternatives is predominately privately owned, with some public ownership scattered throughout (see Maps 5-1A through 5-1D). Public owners include federal and state agencies, and city and county governments. There are also many large and small private landowners.

Most private land includes small parcels or holdings by individual landowners, and large parcels or holdings owned by PacifiCorp and private commercial timber companies including Longview Timberlands LLC (Longview Timber), Sierra Pacific Industries, and Weyerhaeuser Company. Public agencies that own or manage lands directly crossed by the project include WDNR, the city of Camas, and the Port of Portland. A more detailed analysis of WDNR lands in the project area is in Appendix A.

5.1.2 Land Use

In the counties and cities where the action alternatives are located, there are five general categories of existing land use: **urban/suburban**, **rural**, **timber production**, **agriculture**, and **open space** (which include both forested and non-forested areas) (see Maps 5-2A through 5-2D). Cowlitz County has large areas of mostly forested open space and timber production. Agriculture and rural residences are also scattered throughout the county. Clark County also has large areas of forested open space and timber production, but has more agriculture and rural residences than Cowlitz County. Higher density urban/suburban areas occur in and around the cities of Kelso and Longview to the north and in the greater Portland–Vancouver metropolitan area to the south, which includes land in Multnomah County.

5.1.2.1 Urban/Suburban

Urban and suburban land uses within the project area are mainly in the many incorporated cities in Cowlitz, Clark, and Multnomah counties. Incorporated cities in Cowlitz County include

Castle Rock, Kelso, Longview, Kalama, and Woodland. The urban and suburban land uses that make up these cities include typical mid- to high-density development, such as single and multi-family residential uses, commercial uses (e.g., retail space, restaurants, gas stations, and office buildings), public and municipal buildings, churches, parks, industrial uses, and associated utility facilities, roads, and impervious surfaces (e.g., parking lots).

Incorporated cities in Clark County include Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, Woodland, and Yacolt. With the exception of Vancouver, these cities tend to be of similar scale and mix of land uses as the cities in Cowlitz County. Vancouver, the largest city in southwest Washington both in population and areal extent, has a broader spectrum of land uses, and more intensive land uses, than the other cities in the project area.

The southern portion of each action alternative after it crosses the Columbia River, including the proposed Sundial substation site, is within unincorporated Multnomah County, Oregon, and the cities of Troutdale and Fairview in Multnomah County. These two cities are within the urban growth boundary for the Portland metro area. These cities offer a combination of multi-family residential, single-family residential, commercial and industrial uses, parks, and open space areas. Public infrastructure in urban/suburban areas includes hospitals, roads and highways, and schools.

Clark County schools in the vicinity of the proposed action alternatives include Beacon Hill Elementary School, Burnt Bridge Creek Elementary School, Cedar Creek School, Covington Junior High School, Kings Way Christian School, Minnehaha Elementary School, Orchards Elementary School, Pleasant Valley Middle School, Pleasant Valley Primary School, Walnut Grove Elementary School, Pacific Junior High School, Sunnyside School, and Lacamas Heights Elementary School. Butler Acres Elementary School is in Cowlitz County.

5.1.2.2 Rural

Rural land uses within the project area are dispersed throughout Cowlitz and Clark counties. Rural, unincorporated communities in Cowlitz County include Yale, Lexington, Ariel, and Cougar. These areas are generally near the Lewis River and along transportation corridors, such as SR 503. Typical land uses in these and immediately surrounding areas include mostly low-density land uses, such as single-family residential uses on relatively large lots, small commercial areas, dispersed industrial uses, parks, churches, public and municipal buildings, and associated infrastructure. Schools in the rural areas of Cowlitz County include Yale Elementary School and Green Mountain Elementary School.

Rural, unincorporated areas in Clark County include Amboy, Brush Prairie, Chelatchie Prairie, Fargher Lake, Hockinson, and Meadow Glade. Clark County identifies these areas as **rural centers**. Rural centers are distinct areas that have small lot patterns for residential development, small-scale businesses that provide convenience shopping and services to nearby rural residents, access to arterial roadways, and are surrounded by protected rural landscapes of generally open land used for agriculture, forestry, large lot residential, recreation, and environmental protection. Rural areas typically have maximum densities of one unit per acre (Clark County 2010). No schools in the rural areas of Clark County are close to the project.

5.1.2.3 Timber Production

Lands used for timber production activities are predominately located in the northern and eastern portions of the project area. These lands are owned or managed by timber companies (Weyerhaeuser, Longview Timber, and Sierra Pacific), utilities (PacifiCorp), or the state (WDNR) and are mostly used for timber production, although other uses occur on these lands including mushroom, cedar bough, salal, and other floral products collection, conservation easements, wildlife management, recreation, and agriculture. (See Chapter 11, Socioeconomics for more information about the economics of timber harvesting and how WDNR manages its trust lands). These lands are forested (some with mature forests and forested wetlands), cleared, or have been replanted. Access roads that were built mainly for hauling cut timber are present within these areas.

5.1.2.4 Agriculture

Lands used for agriculture are scattered about the project area but mostly occur along the Cowlitz River, northeast of Amboy, and along northern portions of Segment 25. Crop production and livestock grazing are the current agricultural uses on these lands. The primary crops grown in the project area include nursery stock, vegetables, berries, Christmas trees, and forage, such as hay, for livestock. Livestock production within the project area includes poultry and cattle (Washington State Department of Agriculture 2010). Agricultural uses in existing BPA rights-of-way occur as allowed under existing easements or agreements between BPA and the underlying landowner (see Chapter 11, Socioeconomics).

Some agricultural land has been removed from production through the federal Conservation Reserve Program (CRP). Under this program, farmers receive annual rent payments to remove highly erodible or other sensitive land from production, and re-establish and maintain natural plant communities for a certain number of years (USDA 2011a). Of the 1,140 total square miles within the boundaries of Cowlitz County, about 15 acres are currently enrolled in the CRP (USDA 2011b). Of the 630 total square miles within the boundaries of Clark County, about 128 acres are currently enrolled in the CRP (USDA 2011b).

Prime Farmland and **Farmland of Statewide Importance** are abundant in the project area. Prime farmland is defined as land not already targeted for urban development or water storage that has the best physical and chemical characteristics for producing items such as food, feed, forage, fiber, and oilseed crops (Code of Federal Regulations [CFR] 730-733 Section 657.5). The designation is largely based on soils, slope, and irrigation availability. About 40,380 acres in Cowlitz County and about 117,450 acres in Clark County are prime farmland (NRCS 2009a, 2010a, 2010b).

Farmland of statewide importance, a distinct category from prime farmland, is land that may not meet prime farmland criteria, but that has the potential to economically produce high yields of crops as defined by state agencies. About 293,840 acres in Cowlitz County and about 66,800 acres in Clark County are farmlands of statewide importance (NRCS 2009a, 2010a, 2010b).

Designated prime farmlands and farmlands of statewide importance are also used for residential development and other uses. The designations do not prohibit other uses.

5.1.2.5 Open Space

Open space areas are not developed and have the potential to be used for both production and non-production forest, and for non-forest uses such as rural residential, agriculture or recreation.

Some forests within areas categorized as open space (identified as Open Space – Forested on Maps 5-2A through 5-2D) are being managed for commercial timber production, but by much smaller private landowners not included in the timber production category. Other forested areas within open space could be used for commercial timber production by individual landowners, but are not currently being used for this purpose. Existing vacant BPA rights-of-way cross areas that contain trees that could be harvested and sold as commercial timber. Wetland habitats, shrublands, and rivers and lakes also occur in non-forested open space.

Open space areas (both forested and non-forested) provide opportunities for recreation in the project area. Recreational activities within Cowlitz, Clark and Multnomah counties include boating, fishing, hunting, camping, hiking, bird and wildlife watching, all terrain vehicle (ATV) use, sightseeing, horseback riding, and mountain biking. General day-use activities, including swimming, picnicking, and sports games, also occur in the project area within developed areas such as designated parks and trails (see Chapter 6, Recreation). Open space areas provide opportunities for recreational activities on public lands in the eastern portion of the project area, such as on lands managed by WDNR. The western portion of the Yacolt Burn State Forest provides opportunities for camping, hiking, hunting, fishing, horseback riding, off-road vehicle use, and mountain biking. Open space areas on PacifiCorp lands along the Lewis River near Merwin and Yale dams are also used for recreation.

Open space areas are also used to manage natural resources. WDNR has trust lands set aside for research plots and **genetic reserves** (these areas have the same purpose as conservation areas plus a goal of maintaining and protecting the genetic diversity and integrity of a target species), forest riparian conservation easements, recreation, and habitat conservation for wildlife. Mitigation lands managed by PacifiCorp along the Lewis River provide habitat for and support many fish and wildlife species.

Open space areas are also used for utility and transportation corridors. There are existing transmission lines and rights-of-way within the western and southern parts of the project area. Major transportation corridors near the project include I-5, I-205, SR 14, SR 411 (Westside Highway), SR 500, SR 502, and SR 503. There are also railroad lines within the project area. Burlington Northern Santa Fe (BNSF) owns two mainline rail lines that carry freight and passengers (via Amtrak) through Clark County: the BNSF Seattle/Vancouver line and the BNSF Vancouver/Eastern Washington line. Clark County also owns the 33-mile-long short line Lewis and Clark Railroad (also known as the Chelatchie Prairie Railroad or the Clark County Railroad; see Chapter 12, Transportation).

5.1.3 General Land Ownership and Use—West Alternative and Options

The West Alternative begins at the Monahan Creek substation site in Cowlitz County, about 3 miles west of the city of Castle Rock. This site is on private land and the existing land use is a combination of rural, agriculture, and open space. The site is mostly used for grazing. Forested

areas and buildings are on and next to the site. Several BPA transmission lines are located west of the site.

The West Alternative parallels existing transmission lines (mostly BPA lines) for about 66 miles of its length, which is almost 98 percent of the total distance. The West Alternative is almost entirely (99 percent) located on private land, and is only 1 percent public land (i.e., WDNR lands).

The West Alternative passes through the cities of Kelso, Vancouver, Camas, Washougal, Troutdale and Fairview, the Longview urbanized area, the Vancouver Urban Growth Boundary, the Camas North Urban Growth Area, the Washougal Urban Growth Boundary, and an urban reserve area in Multnomah County.

Commercial, single-family residential, and multi-family residential areas are crossed within the city of Kelso. The zoning in these residential areas allows maximum densities of 4 to 32 residential units per acre.

As the West Alternative crosses the Lewis River, it begins to pass through many neighborhood associations' boundaries in Clark County, both within and outside the cities of Vancouver, Camas, and Washougal. These include the North Fork Lewis River, East Fork Frontier, Ridgefield Junction, Fairgrounds, Pleasant Highlands, Ramblin' Creek Estates/South Salmon Creek Avenue, Sherwood, Northeast Hazel Dell, West Minnehaha, East Minnehaha, Andresen/St. Johns, Green Meadows, Maple Tree, Sunnyside, Sifton, North Image, Burnt Bridge Creek, Fisher-Mill Plain, Fern Prairie, and Washougal River neighborhood associations.

In the city of Vancouver, the alternative passes through single-family and multi-family residential areas (maximum density 2.2 to 35 residential units per acre), light industrial, and commercial areas (Golder 2011).

The West Alternative passes through residential, commercial, and industrial areas in the city of Camas. These areas are zoned for multi-family residential (maximum density 24 residential units per acre), single-family residential (maximum density 6 residential units per acre), industrial, business park, and commercial uses.

The West Alternative crosses residential and commercial areas of the city of Washougal. These areas are zoned for single-family residential (maximum density 8.7 residential units per acre) and both heavy and light industrial uses. Some areas next to the existing right-of-way have been developed, and some undeveloped areas have been set aside for residential development.

Within the Evergreen and Vancouver school districts (Segment 25), three schools (Orchards Elementary School, Covington Junior High, and King's Way Christian School) are within 500 feet of the edge of the right-of-way. Two state-licensed daycares in the city of Vancouver are also within 500 feet of the edge of the right-of-way.

Lands along the West Alternative outside of city boundaries are used for rural residential uses, schools, commercial areas, undeveloped uses, timber production, agriculture, recreation, and utility and transportation corridors. Agricultural areas are used to grow berries, Christmas trees, hay/silage, grapes, and nursery stock (Washington State Department of Agriculture 2010). WDNR land crossed by the alternative is mostly in the southern part of Cowlitz County. These lands are mostly used for timber production, but one area along Segment 9 has a forest riparian conservation easement. Recreation areas include parks, golf courses, Camp Currie, and the

Lacamas Prairie Natural Area. As the West Alternative approaches the Columbia River, it crosses the North Urban Growth Area for Camas, parks, marinas, and trails (see Chapter 6, Recreation).

As with all the action alternatives, the route crosses the Columbia River and ends at the Sundial substation site. This site is currently used as open space within the Port of Portland's Troutdale Reynolds Industrial Park (Port of Portland 2011), which has planned and existing developed industrial uses, such as existing transmission lines and light industrial businesses such as Federal Express. The site is within Troutdale's and Fairview's city limits in Multnomah County.

Because West Options 1, 2, and 3 are very close to the West Alternative, they generally cross the same land uses and ownership as the West Alternative. There are a few exceptions. West Options 1, 2, and 3 cross portions of Clark County within the urban areas of Vancouver, Camas, and Washougal, but not within these cities' limits. West Option 1 crosses the Camas Meadows Corporate Center and West Option 2 crosses WDNR land (Segment 43) where a school may be planned. The options do not cross the recreation areas closer to the Columbia River.

5.1.4 General Land Ownership and Use—Central Alternative and Options

The Central Alternative begins at the Baxter Road substation site in Cowlitz County, 4 miles northwest of the city of Castle Rock. This site and the surrounding area are on property owned by Sierra Pacific Industries and are used for timber production. Part of the site is within the existing BPA right-of-way and is already cleared.

The Central Alternative parallels existing transmission lines for about 8 miles of its approximately 77-mile length (about 10 percent of the alternative's total distance). Most urban and suburban areas crossed by the Central Alternative are near the northern and southern ends of this alternative, with mostly rural residential, forest, and agricultural areas in between. Most land (73 percent) is privately owned; WDNR (26 percent) and the city of Camas (1 percent) own the remainder.

Similar to the West Alternative, the Central Alternative passes through the cities of Camas, Washougal, Troutdale, and Fairview. Within these urban and suburban areas, land is zoned for commercial, industrial, and residential uses. Although the densities of residential units are similar to the West Alternative and in some cases are higher, the amount of urban and suburban areas is lower.

The Central Alternative passes through several neighborhood associations' boundaries including Proebstel, Washougal River, and Fern Prairie.

The Central Alternative passes through unincorporated areas of Cowlitz County zoned for single-family residential use (maximum density 7.26 units per acre). The alternative also passes through a number of unincorporated Clark County neighborhoods zoned for single-family (maximum density 7.3 units per acre) and multi-family (maximum density 18 units per acre) residential use (Golder 2011). No schools or state-licensed daycares are within 500 feet of the edge of the right-of-way for this alternative.

Rural lands along the route include scattered residences and a small number of agricultural uses. Forested lands cover most of the area crossed by this alternative and are used for recreation by rural residents. The same large timber companies identified for the West Alternative have

extensive holdings both in the north and central parts of the alternative in Cowlitz County. Timber production also occurs on smaller private holdings in both counties (mostly in Clark County). PacifiCorp manages its lands along the Lewis River for both wildlife and recreation. Trails on public lands (WDNR land on Segment V and Riverfront Park closer to Longview on Segment F) are also crossed. The City of Camas owns land within a watershed that is sometimes used to supply a portion of the city's drinking water. Similar to all action alternatives, the Central Alternative crosses recreation areas as it approaches the Columbia River, then, crosses the Columbia River into the Sundial substation site (see Section 5.1.3, General Land Ownership and Use—West Alternative and Options).

Central Option 1 uses the Casey Road substation site instead of Baxter Road. This site is about 2 miles north of the Baxter Road substation site, northwest of the city of Castle Rock in Cowlitz County, on WDNR property used for timber production. Most of this site has been cleared for timber production activities. Land along the option between Casey Road and Baxter Road substation sites is owned by Sierra Pacific Industries and WDNR and is used for timber production.

Central Option 2 uses Monahan Creek substation site instead of Baxter Road (see Section 5.1.3). It crosses residential areas within the urbanized area of Longview. Outside of the urbanized area, it crosses timber production land owned by Longview Timber and Weyerhaeuser. It also crosses open space lands (some possibly being used for timber production by smaller landowners) with some scattered agricultural areas and rural residences.

Central Option 3 crosses mostly privately owned rural residential and open space land with some scattered agricultural land. This option crosses Moulton Falls State Park and Lucia Falls/Moulton Falls trail within the park. WDNR is a landowner along a smaller portion of this option and has a permanent research plot and genetic reserve along Central Option 3 (Segment 30) in the central part of Clark County.

5.1.5 General Land Ownership and Use—East Alternative and Options

The East Alternative begins at the Baxter Road substation site and parallels existing transmission lines for about 8 miles of its approximately 76-mile length (almost 11 percent of the total distance). Similar to the Central Alternative, it passes through some urban and suburban areas near the beginning and end of its length, but most land along the alternative is rural residential, agricultural, and forest land. About 85 percent of the land is privately owned, and WDNR (14 percent) and city and county governments (less than 1 percent) own the remaining land.

Similar to the West and Central alternatives, the East Alternative passes through the cities of Camas, Washougal, Troutdale, and Fairview. However, there is a smaller amount of urban and suburban areas along the East Alternative, and lower residential property densities due to a relatively greater amount of rural areas (Golder 2011).

The East Alternative passes through unincorporated areas of both Cowlitz and Clark counties, and the same neighborhood associations' boundaries and zoning districts discussed in the Central Alternative (see Section 5.1.4, General Land Ownership and Use—Central Alternative and Options). No schools or state-licensed daycares are within 500 feet of the edge of the right-of-way for this alternative.

Forested lands cover most of the area crossed by this alternative, and are managed mostly for timber production. Publicly owned forested lands are also managed for recreation (trails) and wildlife habitat, including the Yacolt Burn State Forest. PacifiCorp manages its lands along the Lewis River for both wildlife and recreation. The City of Camas owns land within a watershed that is used at times to supply a portion of the city's drinking water. Timber companies own large tracts in the north and central parts of the alternative in Cowlitz County. Rural land along the route is used for grazing or other agricultural uses, and small areas are developed with rural residences.

Similar to all action alternatives, the East Alternative crosses recreation areas closer to the Columbia River and crosses the Columbia River into the Sundial substation site (see Section 5.1.3, General Land Ownership and Use—West Alternative and Options).

East Option 1 uses the Monahan Creek substation site instead of Baxter Road (see Section 5.1.3). It crosses timber production land owned by Longview Timber and Weyerhaeuser. It also crosses open space lands (some possibly being used for timber production by smaller landowners) with some scattered agricultural areas and rural residences.

Similar to the East Alternative, forested lands cover most of East Option 2, and are managed mostly for timber production. Publicly owned forested lands (WDNR) are also managed for recreation (trails) and wildlife habitat, including the Yacolt Burn State Forest. The City of Camas owns land within a watershed that is used at times to supply a portion of the city's drinking water. Timber companies own large tracts along the northern part of the option and small tracts to the south in Clark County. Rural residences occur along the southwestern boundary of this option.

East Option 3 is on WDNR and a portion of existing BPA right-of-way and avoids the Camas City watershed.

5.1.6 General Land Ownership and Use—Crossover Alternative and Options

The Crossover Alternative begins at the Monahan Creek substation site and parallels existing transmission lines for about 33 miles of its approximately 74-mile length (almost 45 percent of the total distance). About 79 percent of the land is privately owned. The remaining land is owned by WDNR (20 percent) and city and county governments (less than 1 percent).

The Crossover Alternative follows the West Alternative from the Monahan Creek site and passes through forest lands to intersect with and follow the route of the Central Alternative. The Crossover Alternative runs northeast parallel to Merwin Lake, where it passes through rural residential and forest lands. Turning south, it follows the same route as the East Alternative. Most land is forested and managed for timber production. Forested lands not managed for timber production are used for recreation and wildlife habitat, including the Yacolt Burn State Forest. Rural lands support a small number of rural residences and agricultural uses.

Similar to all action alternatives, the Crossover Alternative passes through the cities of Kelso, Camas, Washougal, Troutdale, and Fairview, and the Longview urbanized area. The Crossover Alternative passes through unincorporated areas of both Cowlitz and Clark counties, and the same neighborhood associations' boundaries and zoning districts discussed in the Central

Alternative (see Section 5.1.4, General Land Ownership and Use—Central Alternative and Options) (Golder 2011).

No schools or state-licensed daycares are within 500 feet of the edge of the right-of-way for this alternative.

Similar to all action alternatives, the Crossover Alternative crosses recreational areas closer to the Columbia River and crosses Columbia River and into the Sundial substation site (see Section 5.1.3, General Land Ownership and Use—West Alternative and Options).

Crossover Option 1 crosses open space, agricultural, and rural residential areas in the Camas North Urban Growth Area, and several recreation areas including the Lacamas Prairie Natural Area and Camp Currie. It crosses the Fern Prairie neighborhood on existing BPA right-of-way.

Crossover Options 2 and 3 both begin at the Baxter Road substation site (see Section 5.1.4, General Land Ownership and Use—Central Alternative and Options). Land along the options between the Baxter Road and Monahan Creek substation sites is mostly owned by Sierra Pacific and Weyerhaeuser with some smaller, private landowners. Timber production is the primary land use with some rural residential area towards the south.

5.2 Environmental Consequences

General impacts that would occur for the action alternatives are discussed below, followed by impacts unique to each alternative. Impacts specific to WDNR lands in the project area are also discussed in Appendix A.

5.2.1 Impact Levels

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

- A permanent change in land use that is incompatible with existing land use
- A permanent change to landowner property use where new right-of-way or easements are required
- A permanent change in land ownership
- A new unauthorized land use or access that may or may not be compatible with existing land use

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

- A permanent change in land use that is compatible with existing land use
- A permanent change to landowner property use within an existing easement
- Permanently limited access to agricultural or timber production areas (**stranded use**)
- An increase in unauthorized land use or access that may or may not be compatible with existing land use
- A temporary (more than one month at a time) change in or interruption to land use or access to existing land uses

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

- A temporary (one month or less at a time) change in or interruption to land use or access to existing land uses
- A temporary or permanent (but very minor) change in landowner property use within an existing easement or where new right-of-way or easements are required
- A temporary unauthorized land use or access that may or may not be compatible with existing land use

No impact would occur where existing land uses or ownership could continue as before.

5.2.2 Impacts Common to Action Alternatives

5.2.2.1 Construction

Urban/Suburban and Rural

During construction, everyday activities in urban/suburban and rural areas could be interrupted by construction workers, noise and dust from heavy equipment, helicopters, or rock blasting, and by land access restrictions for safety and security (see Chapter 10, Public Health and Safety; Chapter 12, Transportation; Chapter 20, Climate; and Chapter 21, Air Quality).

Project construction would take place over about 30 months. In general, crews could complete about 10 miles of transmission line in 4 months. Construction would occur at any one location for only a few weeks at a time, but multiple crews would simultaneously be working on different activities in different areas along the route over the 30-month period. Construction activities would include vegetation clearing and grubbing; construction of access roads, tower foundations and towers; and conductor stringing and tensioning (see Chapter 3, Project Components and Construction, Operation and Maintenance Activities). Road construction or improvements would occur before line construction, causing similar localized noise and dust. Materials and vehicles would be stored and staged at staging areas. Construction activities, and the interruptions they would cause to developed and rural land uses, would be temporary, a **low** impact.

Because most of the existing right-of-way proposed to be used by some alternatives has been vacant for decades, adjacent landowners and others have used the right-of-way for the activities described in Section 5.1, Affected Environment. In urban/suburban and rural areas, trails and other recreational facilities have been a popular and sometimes compatible and acceptable use within the existing right-of-way. Other compatible uses for the existing, vacant, right-of-way are commercial and industrial parking lots, and public road crossings.

Other existing uses, referred to by BPA as **encroachments**, occur but may not be a compatible or allowed use within the existing right-of-way, depending on existing easements and land use agreements. Types of encroachments on the existing right-of-way include tall-growing landscaped vegetation; unauthorized recreation such as ATV use; storage of RVs, cars and boats; permanent structures such as garages, sheds, shops, and detached apartments; fences through tower legs; decks; and swimming pools. These encroachments, while compatible with urban/suburban and rural land uses, would likely not be compatible with the project and would likely need to be removed prior to construction. BPA would notify landowners, and, consistent

with existing easement and land use agreements, would require the right-of-way be cleared of encroachments, a permanent change to landowner property use and a **low-to-moderate** impact.

Timber Production

During construction, timber production areas would be cleared for the new right-of-way, roads, and substations. No timber production lands have been identified on vacant existing right-of-way. Danger trees or trees within a safety backline would also be cleared outside of the new right-of-way (see Section 3.11, Vegetation Clearing). Since these lands are being used for timber production, harvest of mature timber with fair compensation to the landowner would be consistent with the existing land use and would not affect this type of land use during construction. If timber is not ready for harvest, BPA would compensate the landowner for clearing timber earlier than planned. **No-to-low** impacts would occur during construction since construction activities would be temporary (see Section 5.2.2.2, Operation and Maintenance, for long-term, permanent impacts from clearing) and BPA would notify and coordinate with landowners regarding construction and harvest schedules. These areas are not populated and the typical interruptions from construction would not affect day-to-day activities. Construction staging areas and conductor pulling areas that were not within the right-of-way would be cleared, and owners would be compensated.

Agriculture

Depending on the time of year, crops could be damaged by construction activities. Heavy machinery, materials stored on the ground, trenches for counterpoise, and other activities could damage crops and compact soils, causing a temporary loss of soil productivity. The damage would depend on the type of crop (vineyards, orchards, or row crops), the season (during summer growing season, harvest, or winter when plants are dormant), and if the land was in use or fallow. Damage to crops and land disturbance during construction would be a **low** impact because construction activities would be temporary and BPA would compensate landowners for crop loss during construction.

Livestock grazing and farming in the area may need to be temporarily restricted to avoid conflicts between livestock or farm equipment and construction activities. This would be a **low** impact because it would be temporary, and BPA would provide compensation for losses and would notify and coordinate with landowners regarding construction schedules. As with most land uses, disturbance during construction and vegetation removal could introduce or spread noxious weeds (see Chapter 17, Vegetation).

Open Space

The presence of construction workers, noise and dust from heavy equipment, helicopters, or rock blasting could temporarily limit access to recreational areas (forested or non-forested) within open space areas, increase traffic on roads that are also used to access recreational areas, and intrude on recreational experiences. These types of intrusions into recreational experiences would be temporary and a **low** impact. Likewise, these types of intrusions could affect wildlife and wildlife habitat within open space areas (see Chapter 18, Wildlife).

Where non-forested open space areas close to rural residences are being used for agricultural purposes (for example, small or large gardens), impacts from construction would also be temporary and **low**, for the reasons described above for impacts to agricultural lands.

Most open space areas potentially affected by the project are forested. During construction, these forested areas would be cleared within the right-of-way and for the substations and access roads. Additional danger trees would likely be removed in some areas (see Section 3.11, Vegetation Clearing). As described for timber production lands, landowners would be compensated for timber harvested from these areas. In forested open space areas where the existing use is for timber production by small landowners or if the forested open space is not being used for timber production but is being used for the enjoyment of the landowner, **no-to-low** impacts to land use would occur from construction. In both cases landowners would be compensated for all clearing (see Section 5.2.2.2, Operation and Maintenance, for long-term permanent impacts from clearing in open space).

5.2.2.2 Operation and Maintenance

Unauthorized Access

If a decision is made to build a new line, new and improved access roads and new right-of-way could create an avenue for unauthorized public access and use of public and private land. At a landowner's request, BPA would place gates at the entrance of access roads to prevent public access onto public and private land and the right-of-way. Even with gates, unauthorized access and use of the right-of-way and nearby land could occur.

In general, unauthorized public access and use of public and private land could cause new uses and activities that may be incompatible with existing land uses. These new uses and activities could cause increased soil erosion, fire danger, introduction of noxious weeds, and illegal dumping. Increased soil erosion could occur from unauthorized uses such as driving off-road vehicles in unauthorized areas and disturbing the soil, which can lead to soil erosion. Over time, unauthorized use of gravel or dirt roads near the project could also lead to similar accelerated deterioration of these roads (see Chapter 14, Geology and Soils). Fire danger can increase when unauthorized users build campfires, discard lit cigarettes, or if vehicle exhaust systems contact dry vegetation (see Chapter 10, Public Health and Safety). Noxious weeds can be introduced to an area when unauthorized vehicles inadvertently transport and spread noxious weed seeds into the project area and nearby lands. If these vehicles also disturb soil, the potential for the noxious weeds to become established in these disturbed areas increases (see Chapter 17, Vegetation).

Unauthorized access and use could also disturb vegetation, wildlife and their habitat, and cultural resources. Vegetation and wildlife habitat can be disturbed by unauthorized vehicles driving over and crushing or uprooting plants, and by any vegetation clearing from an unauthorized use (see Chapter 17, Vegetation). Wildlife can be disturbed or displaced by noise and noise can increase stress, disrupt normal foraging and reproductive habits, cause abandonment of unique habitat features, and increase energy expenditures (see Chapter 18, Wildlife). Known or previously undiscovered cultural resource sites can be disturbed and damaged by the unauthorized collection of artifacts or other cultural resources (see Chapter 13, Cultural Resources).

According to scoping comments and conversations with landowners, existing access roads and rights-of-way are providing opportunities for unauthorized access and use that may be incompatible with the existing land uses. The degree to which this would continue into the future is unknown. It is also unknown to what degree improved and new access roads or new rights-of-way would increase or create new opportunities for unauthorized access and use. Location and frequency of unauthorized access is hard to predict, it could be a one-time temporary occurrence or it could become permanent if access is hard to prevent. For these reasons, impacts could be **low-to-high**.

Urban/Suburban and Rural

BPA would negotiate and purchase easements for new right-of-way (transmission line and access roads) from landowners with affected properties. These easement documents would describe right-of-way use limitations for the underlying landowner. BPA does not permit activities or land uses in the right-of-way that are unsafe or might interfere with constructing, operating, or maintaining transmission facilities. These restrictions are developed in accordance with NESC requirements and are part of the legal rights BPA acquires for its transmission line easements (see Chapter 3, Project Components and Construction, Operation and Maintenance Activities and Chapter 10, Public Health and Safety).

Use limitation within the right-of-way would require keeping it clear of all structures, fire hazards, tall-growing vegetation (generally taller than 4 feet) and any other use that may interfere with the safe operation or maintenance of the line. Landowners would be prohibited from placing tall-growing vegetation, permanent structures, or outbuildings, including swimming pools, fences, and decks, within the new right-of-way, and would be required to remove these uses currently within existing rights-of-way, a **low-to-moderate** impact (see Section 5.2.2.1, Construction).

Permanent use limitations created by BPA acquiring new easements for right-of-way in an area where none have existed before would be a **high** impact. Where these new easements might create use limitations off of, but adjacent to, existing right-of-way (e.g., removing danger trees that are part of a landowner's landscaped yard or limiting an existing recreation use) or cause a stranded use of the property, impacts would be **low-to-high** depending on the existing use and whether that use could continue. The transmission line could create other possible issues for residents, such as impacts on views from homes, or concerns about property values and electric and magnetic field exposure (see Chapter 7, Visual Resources, Chapter 11, Socioeconomics, and Chapter 8, Electric and Magnetic Fields).

For new and existing rights-of-way, the area between towers and roads are generally compatible with urban/suburban and rural land uses such as trails, sports fields, and roads (often used as a trail) (see Section 5.2.2.1, Construction), and permanent impacts would be limited to the land under the tower or road (substations are not proposed within this land use). New or improved access roads in urban/suburban areas off the right-of-way are unlikely to affect future development in the surrounding area because this type of development is typically located near roads. For this reason, development of new access roads or improvement of existing roads in urban/suburban land uses would be a **moderate** impact. This same type of road development in rural land uses would be **moderate-to-high** depending on the type of existing or planned development in the vicinity of the existing or planned roads.

Twice each year helicopter flyover inspections would create temporary noise along the transmission line. Annual ground inspections of the line may be noticeable to landowners as crews drive on access roads and walk the right-of-way. Vegetation management activities would also require personnel to drive along access roads or walk the right-of-way to determine vegetation clearing needs. Cutting trees with chainsaws and removing debris would cause noise and dust. Equipment noise during repairs may be noticeable but would be infrequent. Maintenance impacts on uses within urban/suburban and rural areas would be **low** because disturbances would be temporary and mostly limited to noise, dust, managing vegetation, and a small amount of vehicle traffic.

Timber Production

Timber production areas crossed by new rights-of-way and access roads, or under towers and substations would be permanently affected because trees would be prevented from growing within these areas, curtailing growing and harvesting activities and future revenue potential. Danger trees or trees within a safety backline outside of the right-of-way (see Section 3.11, Vegetation Clearing) would also be removed. In some cases, depending on location and local forest practices, a right-of-way or new access road could permanently disrupt forest practices on both sides of the right-of-way or road. This could occur if timber harvest requires crossing the right-of-way with equipment (cranes, derricks, and booms) or trucks moving or hauling harvested timber across right-of-way. A right-of-way can also make certain timber stands inaccessible or economically infeasible to harvest (stranded use). Permanent land removal from timber production would be a **high** impact (see also Chapter 11, Socioeconomics for the economic effects of timber production losses).

Staging areas and conductor pulling areas outside the right-of-way cleared during construction could be re-planted and used for timber production after the line is operating, as long as these trees would not become danger trees. Since compensation would be provided for clearing during construction and clearing in these areas is temporary, **no-to-low** impacts would occur. Maintenance activities would have **no** impacts on uses within timber production areas outside of cleared areas because BPA would communicate scheduling in advance with landowners.

Agriculture

Agricultural activities can occur within the right-of-way under certain conditions and at appropriate locations. In general, cultivated crops that do not require structural support and do not grow higher than 4 feet at mature height may remain in the existing right-of-way and are allowed in the new right-of-way between the towers and roads. These might include vegetable crops, strawberries, mint, and other low-growing crops. However, orchards, tall-growing natural or planted vegetation used for landscaping, or windrows, and crops supported by trellises or stakes (e.g., grapes or cane berries) would likely not be allowed within the right-of-way, a **high** impact if they already exist or are planned for these areas. Farm vehicles and large equipment that do not extend more than 14 feet high, such as harvesting combines, cranes, derricks and booms, could be operated safely under the line where it passes over roads, driveways, parking lots, cultivated fields or grazing lands.

Crop cultivation within the right-of-way would be negotiated when a new easement is purchased for new right-of-way. On existing right-of-way, BPA would review existing easement and land use agreements to determine if existing crops are compatible with the new line. Stranded use of agricultural land could also be caused by a new right-of-way or construction of

the project on existing right-of-way, a **high** impact depending on whether existing uses could continue.

Working with the landowner, BPA would try to locate access roads along fences or property lines for access across fields. Towers would create an obstacle for mechanical tilling, and if irrigation is used, it may need to be modified such that pipes maneuver between or around the towers. Because the areas under towers and roads would not be tilled, they could become sources of noxious weeds, creating a seed source for contaminating a field (see Chapter 17, Vegetation). BPA works closely with underlying landowners to minimize weed infestations.

Grazing tends to be compatible with transmission lines, because livestock would be able to graze within the right-of-way. Although towers and roads would remove that area of vegetation from grazing, livestock (and wildlife) could still maneuver around the towers and roads. Depending on the size of the original property, how much land is available for grazing and how the project may limit or eliminate the original grazing use, impacts would be **low-to-high**. In some cases, grazing could increase because trees would be permanently removed. During line maintenance, workers would ensure that gates are closed to prevent livestock from escaping.

Maintenance of the transmission line would temporarily disrupt land use through noise, truck traffic, and vegetation management activities (see Urban/Suburban and Rural), a **low** impact.

Open Space

Operation and maintenance of transmission lines and access roads could create or increase unauthorized access to undeveloped rural areas (see Unauthorized Access).

Forested and non-forested open space within existing and new rights-of-way, and where roads and substations are proposed would permanently change to non-forested open space, a **moderate-to-high** impact, depending on whether existing uses within that open space could still occur, are altered or limited, or permanently prohibited. Compatible uses within forested or non-forested open space, such as recreational activities, while temporarily impacted (see Section 5.2.2.1, Construction), could continue even after project facilities are constructed, a **moderate** impact. In forested open space being used for timber production activities by small landowners, the same **high** impact on these uses would occur as described in Timber Production. Any stranded uses caused by the project that permanently discontinues that use would likely be a **high** impact.

Maintenance of the transmission line would disrupt recreation through noise, dust, truck traffic, and vegetation clearing, or herbicide application (see Urban/Suburban and Rural). Overall, operation and maintenance impacts on open space would be **low**. Impacts would generally be temporary and limited to noise, dust and a small amount of vehicle traffic during maintenance.

5.2.2.3 Sundial Substation

Sundial Substation and its access road would remove about 25 to 50 acres (exact amount unknown until final design is complete) from Port of Portland ownership and the land would become BPA fee-owned property. In addition, some non-BPA transmission line and access road work would occur in the city of Fairview near this substation site.

Though the Port of Portland would be compensated for land acquired by BPA for the proposed project, this land would no longer be available to the Port for an industrial use development or for planned wetland mitigation, a **high** permanent impact.

Because the site is within an existing industrial area, temporary noise, dust, and traffic impacts on existing land uses during construction would be **low**. Though the substation, access roads, and line changes would occur in mostly non-forested open space (40 acres; a portion is identified for Port of Portland wetland mitigation), the area is within an industrial complex with planned and existing industrial uses.

Maintenance and operation of the substation and associated facilities would not be a change in planned use and would have **no** impact on existing and nearby land uses, which include a FedEx distribution center, a marine construction and repair company, a gravel company, a paper products company, an existing substation and transmission lines, and the Portland-Troutdale Airport.

BPA would purchase about 25 to 50 acres for each of the proposed substations and substation access roads, with exact acreage depending on the parcel selected and the final substation and access road design.

For purposes of the land use analysis, an estimated impact area was defined at each substation site to accommodate adjustments in substation and substation access road design and positioning that occur throughout the design process.

5.2.3 Castle Rock Substation Sites

5.2.3.1 Casey Road

Casey Road Substation and its access road would remove about 25 to 50 acres (exact amount unknown until final design is complete) from WDNR ownership and the land would become BPA fee-owned property. This would be a **high** impact on land ownership though WDNR has large land holdings in the project area and in Washington in general.

Impacts common to action alternatives are in Section 5.2.2. The remaining sections discuss impacts unique to each alternative, and recommended mitigation measures.

The Casey Road site would permanently remove about 63 acres of WDNR land from mostly timber production use, causing a **high** impact. Final design of the substation would likely decrease the number of acres removed from timber production. The substation would be partially within the existing right-of-way and would not prevent access to surrounding timber production areas or create stranded uses. Target practice does occur at this site, an unauthorized use that would not be allowed to continue, a **moderate** impact.

5.2.3.2 Baxter Road

Baxter Road Substation and its access road would remove about 25 to 50 acres (exact amount unknown until final design is complete) from Sierra Pacific Industries ownership and the land would become BPA fee-owned property, a **high** impact on land ownership.

The Baxter Road site would remove about 47 acres of Sierra Pacific Industries land from mostly timber production, a permanent conversion of land use and a **high** impact. Final design of the substation would likely decrease the number of acres removed from timber production. The substation would be partially within the existing right-of-way and would not prevent access to surrounding timber production areas or create stranded uses.

5.2.3.3 Monahan Creek

Monahan Creek Substation and its access road would remove about 25 to 50 acres (exact amount unknown until final design is complete) from private ownership and the land would become BPA fee-owned property, a **high** impact on land ownership.

The Monahan Creek site would affect about 67 acres of mostly rural and open space lands used for livestock grazing and rural residences. Final design of the substation would likely decrease the amount of acres removed from grazing. Though the substation and associated facilities would be located to avoid residences and existing transmission facilities, it would permanently convert existing land uses to utility use, a **high** impact. The substation would remove a large area of land from grazing, and grazing might be unable to continue depending on the landowners' holdings. Temporary **moderate** impacts from construction would occur to nearby residents and to residents who use Delameter Road to commute because substation construction would be longer in duration (13 months) than construction of any particular portion of the transmission line, and construction would be closer to residents in the general area.

5.2.4 West Alternative

Of the action alternatives, the West Alternative would cross the most urban and suburban and agricultural land use. This alternative would be closer to I-5 than the other action alternatives and would parallel substantially more existing transmission lines, about 66 miles (almost 98 percent of the total distance). The West Alternative would cross the highest percentage (99 percent) of private land and would be located on only 1 percent public land. This alternative also would cross more areas with high density, multi- and single-family residential units, and would have the largest number of homes within various distances from the edge of the right-of-way (see Table 5-1). For the action alternatives, the number of homes at various distances from the edge of the right-of-way generally decreases from west to east (see Table 5-1).



Table 5-1 Numbers of Homes from the Edge of the Right-of-Way

Distance from Edge of Right-of-Way ¹	West Alternative	Central Alternative	East Alternative	Crossover Alternative
500 feet	3,032	327	286	657
300 feet	1,526	173	157	320
100 feet	323	26	25	59
50 feet	174	14	15	29
Notes:				
1. Assuming a 150-foot-wide right-of-way.				

5.2.4.1 Land Ownership

The West Alternative would require some new right-of-way for transmission lines and new and improved access roads. BPA would need to purchase easement rights for the new right-of-way. BPA would acquire new easements on up to 401 acres for the transmission line right-of-way, and new and improved access roads (see Table 5-2). Acreage amounts for new easements for improved roads would depend on whether BPA already owns easement rights on these roads. If BPA has existing rights on some of the improved roads, the new easement requirement would be less than 401 acres. Most land potentially requiring new easements in the West Alternative is privately held (391 acres) and about 10 acres is publicly owned (mostly WDNR).

Because most of the West Alternative would be built on existing right-of-way and use existing access roads, the West Alternative would require fewer new easements and have the least overall impact on landowners of the action alternatives. At the same time, there are more individual landowners who own smaller lots next to the existing right-of-way along the West Alternative than the other action alternatives. Portions of the line and roads built on existing easements would cause **low-to-moderate** impacts on landowners. The remaining portions that would require new right-of-way and easements that would restrict use would cause **high** impact on landowners.

5.2.4.2 Land Use

The West Alternative would use about 1,097 acres of existing right-of-way for about 66 miles (see Table 5-3; the 1,097 acres is the total of the acreages in the “Existing Right-of-Way” columns for each land use type for the West Alternative). About 127 acres of new right-of-way would be needed in certain areas along and adjacent to the existing right-of-way (see Table 5-2, Chapter 4, and Appendix B). The width of this new right-of-way would vary in these areas depending on how much existing right-of-way is available for the new line. Both towers and roads would be built within this new right-of-way. Most new right-of-way (104 acres) would be on open space lands likely being used for recreation by adjacent landowners and others who have enjoyed its natural and rural character since it is next to existing right-of-way that is not currently cleared of vegetation. Outside the new 150-foot right-of-way, an additional 131 acres would be affected on other, adjacent existing BPA rights-of-way where towers need to be removed or replaced and new and improved access roads are required. Over half of this acreage is open space, and the remaining is a mixture of urban/suburban, rural, timber production, and agricultural land.

Urban/Suburban

Urban/suburban land is about 7 percent of the area crossed by the West Alternative. This includes commercial, industrial, and residential areas.

About 2 acres of new right-of-way in urban/suburban areas would be needed for the new line, potentially causing a **high** impact on existing land uses because no tall vegetation, structures, or new development would be permitted within any new right-of-way. **Low-to-moderate** impacts would occur where existing uses would be compatible with project components (e.g., low-growing landscaping). New right-of-way could also affect planned development or use of property next to it, creating **no-to-high** impacts depending on whether a planned development complies with right-of-way restrictions, or an existing adjacent use becomes stranded. Restrictions would occur in few places (e.g., the northwest part of Segment 50).

Table 5-2 New Easements Required on Public and Private Land (Acres)^{1,2}

Alternatives and Options	Private Land ³			Public Land ⁴			Total		
	New Transmission Line Right-of-Way	New Access Roads ⁵	Improved Access Roads ^{5,6}	New Transmission Line Right-of-Way	New Access Roads ⁵	Improved Access Roads ^{5,6}	New Transmission Line Right-of-Way	New Access Roads ⁵	Improved Access Roads ^{5,6}
West Alternative	119	102	170	8	1	1	127	103	171
West Option 1	N/C	+2	-3	N/C	N/C	N/C	-	-	-
West Option 2	-64	-1	-10	+10	+<1	+2	-	-	-
West Option 3	-40	+11	+9	+6	+3	+1	-	-	-
Central Alternative	861	125	516	427	39	144	1,287	165	661
Central Option 1	+30	N/C	+10	+12	+5	+33	-	-	-
Central Option 2	-62	+14	-40	N/C	N/C	N/C	-	-	-
Central Option 3	-20	-4	-37	-86	+1	-9	-	-	-
East Alternative	1,027	105	861	228	36	120	1,255	141	980
East Option 1	-35	+4	-43	N/C	N/C	N/C	-	-	-
East Option 2	-32	-4	-146	+51	-11	-9	-	-	-
East Option 3	-12	N/C	-3	+21	-3	+6	-	-	-
Crossover Alternative	456	92	424	316	41	92	772	133	515
Crossover Option 1	+53	+<1	+7	N/C	N/C	N/C	-	-	-
Crossover Option 2	N/C	+4	+38	N/C	N/C	N/C	-	-	-
Crossover Option 3	+41	+5	+39	N/C	N/C	N/C	-	-	-

Notes:

N/C—No net change from the action alternative.

1. The value for each option represents the net change from the action alternative. It was calculated as the acres for the option minus the acres in the segments the option replaces.
2. Does not include area within existing transmission line right-of-way.
3. Private land includes parcels owned by large landowners, companies, and private individuals.
4. Public land includes state owned (including WDNR and local government).
5. New and improved access road easements (50 feet) outside of new and existing transmission line right-of-way.
6. All or a portion of improved access roads may have existing BPA easement rights.

Source: BLM 2009b

Table 5-3 Land Use (Acres)¹

Alternatives and Options	Urban/Suburban			Rural			Timber Production ²			Agriculture			Open Space ³		
	Existing Right-of-Way ⁴	New Right-of-Way ⁴	Towers 5 and Access Roads ⁶	Existing Right-of-Way	New Right-of-Way	Towers and Access Roads	Existing Right-of-Way	New Right-of-Way	Towers and Access Roads	Existing Right-of-Way	New Right-of-Way	Towers and Access Roads	Existing Right-of-Way	New Right-of-Way	Towers and Access Roads
West Alternative	89	2	6	81	4	13	0	0	12	165	17	19	762	104	81
West Option 1	N/C	N/C	N/C	-1	<-1	N/C	N/C	N/C	N/C	-2	-3	-1	+4	+4	+2
West Option 2	+<1	<-1	N/C	+11	-4	<-1	N/C	+10	+<1	+41	-11	-2	+31	-49	+9
West Option 3	N/C	<-1	N/C	+37	-4	N/C	N/C	+23	+9	+29	-15	-1	+76	-37	+5
Central Alternative	8	13	2	20	7	6	0	974	240	23	12	6	66	281	108
Central Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+42	+10	N/C	N/C	N/C	+3	+<1	+10
Central Option 2	+2	-9	N/C	N/C	<-1	+3	N/C	-81	-9	+6	-10	N/C	+10	+38	-3
Central Option 3	N/C	<-1	N/C	N/C	+11	+5	N/C	-188	-19	N/C	+8	+<1	N/C	+63	-6
East Alternative	8	12	2	20	10	12	0	1,020	319	23	12	11	66	201	132
East Option 1	N/C	-8	<-1	N/C	+9	+2	N/C	-58	-9	N/C	-6	N/C	N/C	+29	+24
East Option 2	N/C	N/C	N/C	N/C	N/C	+<1	N/C	N/C	-51	N/C	N/C	-2	N/C	+18	-19
East Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	+22	+1	N/C	N/C	N/C	+10	-13	-2
Crossover Alternative	20	3	2	59	3	10	0	627	160	39	3	9	453	136	105
Crossover Option 1	+1	N/C	N/C	-9	+4	+<1	N/C	N/C	N/C	+39	+14	+2	+11	+34	+<1
Crossover Option 2	N/C	N/C	N/C	+15	N/C	+3	N/C	N/C	+4	N/C	N/C	N/C	+65	N/C	+11
Crossover Option 3	N/C	N/C	N/C	+15	N/C	+3	N/C	+18	+4	N/C	N/C	N/C	+21	+23	+12

Notes:

N/C—No net change from the action alternative.

1. The value of each option represents the net change from the action alternative. It was calculated as the acres in the option minus the acres in the segments the option replaces.
2. Includes all large landowners that do timber production (commercial timber companies, PacifiCorp, and WDNR).
3. Includes Open Space – Forest (all forested land outside of the Timber Production category) and Open Space – Non Forested.
4. Transmission line right-of-way (up to 150 feet). Also includes portions of new or improved access roads within the right-of-way.
5. Includes removed, rebuilt, or new towers on existing BPA right-of-way but outside of the 150 feet needed for the new transmission line.
6. Includes all new and improved access roads outside of new and existing right-of-way. New access roads assume 30-foot wide disturbance to land use, existing access roads assume 20-foot wide disturbance to land use.

Sources: Herrera 2010, USGS 2011

About 89 acres of existing right-of-way in urban/suburban areas would be potentially affected by the new line (see Table 5-3). This is the greatest amount of urban/suburban land potentially affected by the action alternatives. This acreage is on existing BPA right-of-way next to existing BPA lines. Although this existing right-of-way is owned by BPA or encumbered with existing easements, it has been vacant for decades and, as such, accessed or used for recreation and other activities or uses common in urban/suburban areas. One of the largest uses of the existing right-of-way by adjacent landowners has been for trees and other ornamental landscaping in residential or rural neighborhoods. Some landscaped vegetation is quite mature and would need to be removed. Many encroachments (see Section 5.2.2.1, Construction) have been identified along existing BPA rights-of-way both north and east of BPA's Ross Substation in the greater Vancouver area and would need to be removed.

Where existing incompatible uses would need to be removed both within and adjacent to the existing right-of-way, impacts to land use would be **low-to-moderate**. These uses would include commercial and industrial activities within the urban/suburban land use through the Minnehaha area and closer to the Columbia River. These activities are occurring within the vacant right-of-way (whether or not legally allowed through existing easements or land use agreements) and would not be allowed to continue.

Due to limitations on development in the right-of-way, the project could restrict planned new development or use of property next to the existing and new rights-of-way, a **no-to-high** impact, depending on whether the development planned is in compliance with right-of-way restrictions or whether an existing use is stranded because of the addition of new right-of-way. The West Alternative requires little new right-of-way, so these new development restrictions would occur in few places (the northwest part of Segment 50 is one example). In areas of existing right-of-way, there would be no change to existing restrictions on development.

An additional 6 acres of urban/suburban land outside the 150-foot right-of-way for the new transmission line would be affected by new and improved access roads and by tower removal or construction on adjacent BPA right-of-way. New roads require new right-of-way, similar to the new transmission line, causing similar impacts to those already described. Unlike a new transmission line, a new road in urban/suburban land use could aid future development. Improved access roads already exist within existing land uses and are likely being used by landowners. **No** additional impacts would occur to land use. All existing tower removals or rebuilds on existing transmission lines would occur on existing right-of-way and would cause **no** additional impacts to land use.

Rural

Rural lands are about 7 percent of the land crossed by the West Alternative. This is the greatest amount of rural land crossed by the action alternatives.

About 4 acres of rural land would be crossed by new right-of-way, potentially causing a **high** impact on existing land uses because no tall vegetation, structures, or new development would be permitted within any new right-of-way. **No-to-high** impacts could occur on planned development or use of property adjacent to the new right-of-way, depending on whether development plans comply with right-of-way restrictions or whether an existing adjacent use is stranded because of the addition and placement of new right-of-way.

Where the new line would cross about 81 acres in existing right-of-way, impacts would be **low-to-moderate** because livestock grazing and most low-profile rural uses that do not interfere with safe operation of the line could continue. Similar to Urban/Suburban, recreation activities in rural areas, such as hunting or hiking, could continue. Where existing incompatible uses would need to be removed both within and adjacent to the existing right-of-way, impacts to land use would be **low-to-moderate**.

Although vegetation would need to be cleared from both existing and new rights-of-way (see Chapter 17, Vegetation) on rural land, these areas would remain rural in character after project construction and during operation and maintenance.

About 13 acres outside the new 150-foot right-of-way would be affected or changed from this use where tower removal or construction is required on adjacent BPA right-of-way, or where new and improved access roads are required.

New roads require new right-of-way, similar to the new transmission line, causing similar impacts to those already described. In general, access roads are common and compatible with rural land uses. They could also aid future development. Improved access roads already exist within existing land uses and are likely being used by landowners. **No** additional impacts would occur to land use. All existing tower removals or rebuilds on existing transmission lines would occur on existing right-of-way and would cause **no** additional impacts to land use.

Timber Production

Timber production lands are 1 percent of the land crossed by the West Alternative. New right-of-way would not be needed on timber production land.

The existing right-of-way crosses lands owned by Weyerhaeuser Company, Longview Fiber, and WDNR; all in the northern portion of the alternative. Within the existing right-of-way, these lands are not being used for timber production and would need to be cleared. Landowners would be compensated according to existing easement documents or land use agreements, a **no-to-low** impact. Likewise, removing danger trees outside of the 150-foot right-of-way would have **no-to-low** impacts since compensation would be given. These areas outside the right-of-way would be allowed to be replanted and remain productive into the future.

Another 12 acres of timber production lands would be affected or changed from this use by road improvements and some new roads outside of the existing right-of-way. Improved access roads already exist and any improvements to these roads would likely benefit the underlying landowner and timber production activities. New roads require new right-of-way, similar to the new transmission line, causing a **no-to-low** impact during construction because landowners would be compensated for timber removed, and a **high** impact during operation and maintenance because timber production could not continue in these areas or if the new road causes adjacent stranded use.

Agriculture

Agricultural lands are about 14 percent of the land that would be crossed by the West Alternative.

New right-of-way would restrict agricultural practices on about 17 acres of agricultural land, a **high** impact where certain agricultural activities could not continue because of height restrictions under the new transmission line (for example, Christmas tree, apple, and peach farming, and cultivation of some types of berries such as highbush blueberries [*Vaccinium corymbosum*]). Some agricultural uses, however, such as grazing and cultivation of hay/silage or other row crops less than 4 feet tall (that maintain 25 feet of clearance between the maximum sag of the transmission line and the mature height of the vegetation), would be allowed to continue within new right-of-way in the areas between towers and roads. Impacts in these areas would be **low-to-moderate** because uses may be temporarily restricted during construction but over the long term, these uses would be compatible with the project and could continue, even if somewhat altered.

About 165 acres of existing vacant right-of-way is in agricultural use. Some agricultural activities, mostly in Clark County north and east of Vancouver, would not be permitted to continue within the existing right-of-way (tall-growing crops like those mentioned above). Because BPA owns most of the existing right-of-way in this area, similar to an encroachment, the agricultural activities that interfere with the safe operation of the line would be removed, a **low-to-moderate** impact. Agricultural activities that do not interfere with the safe operation of the line would likely be allowed to continue.

Another 19 acres outside the new 150-foot right-of-way would be affected or changed by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way. New roads require new right-of-way, similar to the new transmission line, causing a **no-to-low** impact during construction because landowners would be compensated for damaged crops. A **high** impact would occur during operation and maintenance because agricultural activities could not continue, or, a new road could cause adjacent stranded use. Typically, in agricultural areas, access roads would be temporary or would be located along field edges to avoid existing crops. Improved access roads already exist and any improvements to these roads would likely benefit the underlying landowner and agricultural activities. All existing tower removals or rebuilds on existing transmission lines would occur on existing right-of-way and would cause **no** additional permanent impacts to agricultural land use.

The West Alternative would change both prime farmland and farmland of statewide importance to towers and roads on and off existing and new right-of-way. Towers and new and improved access roads would change about 61 acres of prime farmland and 79 acres of farmland of statewide importance, totaling about 16 percent of the area within the West Alternative with these state designations. However, only about 24 acres of the 139 acres with these designations are currently included in the agriculture land use, so the West Alternative would only remove about 3 percent of agricultural lands designated as prime farmland and farmland of statewide importance.

Open Space

Open space lands are about 68 percent of the land crossed by the West Alternative. This is the greatest amount of open space among the action alternatives. Open space along the West Alternative includes forested areas (non-production and likely some in timber production by small landowners) and non-forested land. This open space also includes some designated recreation areas (see Chapter 6, Recreation).

New right-of-way would restrict the use of 104 acres of open space land. Another 762 acres of existing vacant right-of-way would be cleared; most has timber on it. In addition, 81 acres of open space outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent, existing BPA rights-of-way.

Impacts on all open space land use affected by the project would generally be **low-to-moderate** because most uses within open space lands would remain compatible with the project. There may be some areas along new right-of-way where small landowners are using lands for timber production. This use would not be able to continue, causing a **high** impact.

None of the open space along the West Alternative is part of a designated wilderness area or wildlife preserve, but a portion along segments 36, 36A, 36B, 40, 41, 45, 46, and 50 has recently been designated as a natural area by the Washington State Commissioner of Public Lands (see Sections 17.1.1.5, Herbaceous, and 17.1.2.1, WDNR Protected Areas). WDNR also owns a forest riparian conservation easement along Segment 9 that would likely be affected by clearing along the existing right-of-way and possibly off right-of-way for danger trees, a **moderate-to-high** impact depending on the exact location of the easement, and types of existing vegetation and extent of clearing needed.

5.2.4.3 West Option 1

West Option 1 would replace a portion of the alternative that follows existing right-of-way just east of Vancouver with an option that is farther west and closer to Vancouver. This portion of the alternative includes replacing one of the existing 230-kV lines with a new double-circuit 500-kV line. The existing 230-kV line and the new line would be placed on new 500-kV towers. West Option 1 would have a negligible decrease in private lands crossed by project components (see Table 5-2). The option would cross the same acreage of timber production land as the West Alternative. The option crosses 10 additional acres of open space land, about 2 fewer acres of urban/suburban and rural land, and 6 fewer acres of agricultural land (see Table 5-3). The option would reduce the prime farmland and farmland of statewide importance in agricultural use needed for the project by about 3 acres.



Impact levels on land ownership and land use would be the same as the West Alternative.

5.2.4.4 West Option 2

West Option 2 would replace a portion of the alternative in the rural residential areas north of Camas with an option farther to the east in the same area. West Option 2 would reduce private lands needed for project components by about 75 acres. A 12-acre section of public property on Segment 43 would be needed for new right-of-way and access road easements (see Table 5-2). The local school district has expressed interest in this land for a new school. The project would likely prohibit this use depending on design and placement of permanent buildings.

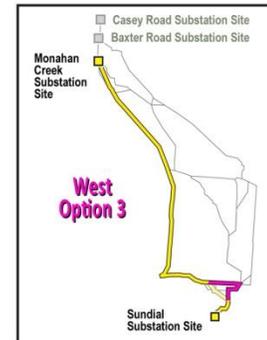


West Option 2 would add about 6 acres of urban/suburban and rural land, 11 acres of timber production land, and 28 acres of agricultural land to the area crossed by project components. The option would reduce the amount of open space cleared by about 9 acres (see Table 5-3). West Option 2 would increase the prime farmland and farmland of statewide importance in agricultural use needed for towers and roads by about 5 acres.

Impact levels on land ownership and land use would be the same as the West Alternative.

5.2.4.5 West Option 3

West Option 3 would replace a portion of the West Alternative in the rural residential areas north of Camas with a route crossing rural residential and rural areas farther east. The option would reduce private lands crossed by project components by 20 acres and increase the area of public lands needed for new right-of-way and access road easements by 10 acres along segments T and 49 (see Table 5-2).

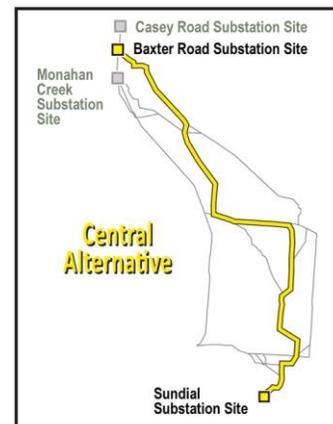


West Option 3 crosses about 32 additional acres of urban/suburban and rural land, 32 acres of additional timber production land, 13 acres of additional agricultural land, and 44 acres of additional open space. This option would cross the greatest amount of urban/suburban and rural land of the options, and the greatest amounts of timber production and open space land (see Table 5-3). West Option 3 would increase the amount of prime farmland and farmland of statewide importance in agricultural use needed for the project by about 3 acres.

Impact levels on land ownership and land use would be the same as the West Alternative.

5.2.5 Central Alternative

The Central Alternative would parallel existing transmission lines for about 8 miles (about 10 percent of the alternative's total distance), but would require new right-of-way for the remaining approximately 69 miles of its total 77-mile length. Most urban and suburban areas crossed by the Central Alternative are near the northern and southern ends of this alternative, with mostly rural residential, forest, and agricultural areas in between. Of the action alternatives, the Central Alternative would cross the second highest amount of land being used for timber production. Most land (73 percent) is privately owned; WDNR (26 percent) and the city of Camas (1 percent) own the remainder. This alternative also would cross areas with high density, multi- and single-family residential units, and would have the third highest number of homes within various distances from the edge of the right-of-way (see Table 5-1).



5.2.5.1 Land Ownership

The Central Alternative would require new right-of-way for transmission lines and new and improved access roads. BPA would need to purchase easement rights for the new transmission line right-of-way and new and improved access roads. BPA would acquire new easements on up

to 2,113 acres for these project elements (see Table 5-2). Acreage amounts for new easements for improved roads would depend on whether BPA already owns easement rights on these roads. If BPA has existing rights on some of the improved roads, the new easement requirement would be less than 2,113 acres.

Most land potentially subject to new easements in the Central Alternative is privately held (1,502 acres) by large landowners, including Sierra Pacific, Weyerhaeuser and Longview Timber. About 610 acres of public land (594 acres owned by WDNR and a small portion owned by the city of Camas) would also require easements. Portions of the line built on an existing easement would cause a **low-to-moderate** impact on landowners. The remaining portions that would require new right-of-way and easements restricting use would cause **high** impact on landowners.

5.2.5.2 Land Use

The Central Alternative would use about 117 acres of existing right-of-way for about 8 miles (see Table 5-3; the 117 acres is the total of the acreages in the “Existing Right-of-Way” columns for each land use type for the Central Alternative). In addition, about 1,287 acres of new 150-foot right-of-way would be needed for the new line and access roads that would be built within this right-of-way (see Table 5-2). New and improved access roads outside the 150-foot right-of-way for the new line and tower removal or construction on adjacent BPA right-of-way would affect an additional 362 acres. Most is open space or timber production land. The remaining is a mixture of urban/suburban, rural, and agricultural land.

Urban/Suburban

Urban/suburban lands are about 1 percent of the land crossed by the Central Alternative, which passes through commercial, industrial, and residential areas in Camas and Washougal.

About 13 acres of new right-of-way in urban/suburban areas would be needed for the project, with **low-to-moderate** impacts where existing uses would be compatible with project components (e.g., a garden or low-growing landscaped vegetation); in areas where existing development would not be permitted within new right-of-way, or where project components would not be compatible with existing uses (e.g., tall landscaped vegetation), impacts would be **high**. Restrictions on new development adjacent to new right-of-way would have **no-to-high** impacts, depending on whether a planned development is in compliance with right-of-way restrictions or whether an existing adjacent use is stranded because of the addition and placement of new right-of-way.

About 8 acres of existing urban/suburban right-of-way would be affected by the new line. This acreage is on existing BPA right-of-way next to existing BPA lines. Most is undeveloped or developed with industrial uses closer to the Columbia River. With a new line and roads, previous industrial uses within vacant existing right-of-way (whether or not legally allowed through existing easements or land use agreements), would not be allowed to continue, a **low-to-moderate** impact.

An additional 2 acres of urban/suburban land outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way. New roads require new right-of-way, similar to the new transmission

line, causing similar impacts to those already described. Unlike a new transmission line, a new road in urban/suburban land use could aid future development. Improved access roads already exist within existing land uses and are likely being used by landowners. **No** additional impacts would occur to land use. All existing tower removals or rebuilds on existing transmission lines would occur on existing right-of-way and would cause **no** additional impacts to land use.

Rural

Rural lands are about 2 percent of the land crossed by the Central Alternative. Most is rural residential and is developed with low-density housing and related structures.

About 7 acres of rural land would be crossed by new right-of-way and about 20 acres near the Little Washougal River and northwest of the city of Washougal would be crossed by existing right-of-way. About 6 acres outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way.

Impacts on existing rural land uses and limitations on new development would be similar to the West Alternative.

Timber Production

Timber production lands are about 67 percent of the land crossed by the Central Alternative. Most is owned by large landowners such as Weyerhaeuser, Longview Timber, and WDNR.

About 974 acres of timber production land would be crossed by new right-of-way. During construction, trees would be removed and landowners would be compensated for the timber, a **no-to-low** impact. Over the long term, impacts would be **high** because timber production could not continue in the right-of-way. Also, placement of the new right-of-way could cause stranded uses for timber harvest. If danger trees need to be removed outside of the 150-foot right-of-way (see Section 3.11, Vegetation Clearing), a **no-to-low** impact would occur, since landowners would be compensated. After construction, these areas outside of the right-of-way would be allowed to be replanted and remain productive into the future.

Existing right-of-way does not cross timber production land.

About 240 acres outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent existing BPA right-of-way. Improved access roads already exist and any improvements to these roads would likely benefit the underlying landowner and timber production activities. New roads require new right-of-way, similar to the new transmission line, causing a **no-to-low** impact during construction because landowners would be compensated for timber removed, and a **high** impact during operation and maintenance because timber production could not continue in these areas or if the new road causes adjacent stranded use.

Agriculture

Agricultural lands are about 2 percent of the land that would be crossed by the Central Alternative.

About 12 acres would be crossed by new right-of-way, and about 23 acres of existing right-of-way in agricultural use would be affected mostly north of Castle Rock and south of the Little Washougal River. Some of these agricultural activities would not be permitted to continue within the existing right-of-way. Like an encroachment, these activities would be removed, a **low-to-moderate** impact within existing right-of-way and a **high** impact if on new right-of-way. Some agricultural uses, however, such as cultivation of hay/silage and other crops under 4 feet tall), or grazing, would continue within the right-of-way. Impacts in these areas would be **low-to-moderate** because these uses would be compatible with the project and could continue though somewhat altered by the project.

Where 6 acres outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way, impacts would be similar to that of the West Alternative, Agriculture.

The Central Alternative would change both prime farmland and farmland of statewide importance to towers and roads on and off existing and new right-of-way. Towers and new and improved access roads would change about 18 acres of prime farmland and 192 acres of farmland of statewide importance, totaling about 26 percent of the area within the Central Alternative with these state designations. However, only about 5 acres of the 210 acres are currently classified as agriculture, so the Central Alternative would only remove about 1 percent of agricultural lands designated as prime farmland and farmland of statewide importance.

Open Space

Open space lands are about 26 percent of the land crossed by the Central Alternative. Open space along the Central Alternative includes non-production forested areas (non-production and likely some production by small landowners) and non-forested land. Open space also includes some designated recreation areas such as the Yacolt Burn State Forest (see Chapter 6, Recreation).

New right-of-way would restrict about 281 acres of open space land, and 66 acres of existing right-of-way would be cleared, most now covered with timber. In addition, 108 acres outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on other adjacent, existing BPA right-of-way.

Impacts on all open space land use affected by the project would generally be **low-to-moderate** because most uses within open space lands would remain compatible with the project. There may be some areas along new right-of-way where small landowners are using lands for timber production. This use would not be able to continue, causing a **high** impact.

5.2.5.3 Central Option 1

Central Option 1 would begin at the Casey Road substation site and the transmission line would cross unpopulated forest production and open space land. The option would increase private lands needed for project components by 40 acres. About 50 acres of additional public property would be needed for new right-of-way easements (see Table 5-2). Central Option 1 would affect about 52 additional acres of timber production land and 14 additional acres of open space land. The option



would not change the area of prime farmland and farmland of statewide importance in agricultural use needed for the project.

Impact levels to land ownership and land use would be the same as the Central Alternative.

5.2.5.4 Central Option 2

Central Option 2 would begin at the Monahan Creek substation site and would remove the portion of the Central Alternative crossing the Cowlitz River north of Castle Rock and running farther to the southeast. This option would add a new route running southeast from the Monahan Creek substation site through sparsely populated land, crossing the unincorporated community of West Side Highway next to SR 411, the Cowlitz River and I-5, and running through largely unpopulated land toward the east. This option would reduce new right-of-way easement needed on private land by 88 acres (see Table 5-2). There would be no net change in public land needed.



Central Option 2 would add about 2 acres of rural land and 45 acres of open space land to the area affected by the project, most in the outskirts of the city of Lexington. This option would reduce the amount of urban/suburban land crossed by the project by a little less than 7 acres, removing urban/suburban impacts north of Castle Rock, but adding impacts within Lexington and Ostrander. About 4 fewer acres of agricultural land and 90 fewer acres of timber production land would be affected (see Table 5-3). The option would decrease the area of prime farmland and farmland of statewide importance in agricultural use needed for the project by less than 1 acre.

Impact levels to land ownership and land use would be the same as the Central Alternative.

5.2.5.5 Central Option 3

Central Option 3 would replace the Lewis River crossing near Ariel and a portion of the Central Alternative between Ariel and Venersborg, with a downstream river crossing and a new route running directly southeast from Ariel through rural residential areas toward Venersborg. This option would reduce new right-of-way easement needed on private land by 61 acres, and would decrease public land needed by 94 acres (see Table 5-2). Of the 94 acres, about 3 acres of public land at Moulton Falls Regional Park would be added north of the East Fork Lewis River on Segment 30.



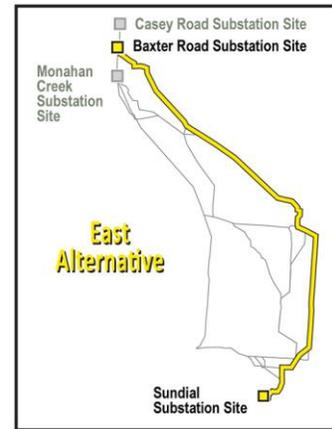
Central Option 3 would add about 16 acres of impact on rural land west of Amboy and north of SR 503. About 9 acres of agricultural land and 57 acres of open space land would be added to the area affected by project components including an area set aside by WDNR for genetic reserves along Segment 30. Portions of this 40-acre plot are within the right-of-way and new and improved access roads (see Chapter 17, Vegetation). This option would reduce the amount of urban/suburban land crossed by almost 1 acre, and would clear about 207 fewer acres of timber production land in the eastern portion of the project area (see Table 5-3). Central

Option 3 would increase the area of prime farmland and farmland of statewide importance in agricultural use needed for the project by less than 1 acre.

Impact levels to land ownership and land use would be the same as the Central Alternative.

5.2.6 East Alternative

The East Alternative would parallel existing transmission lines for about 8 miles (almost 11 percent of the total distance), but would require new right-of-way for the remaining approximately 68 miles of its total 76-mile length. Similar to the Central Alternative, it passes through some urban and suburban areas near the beginning and end of its length, but there is a smaller amount of these areas and lower residential property densities due to a relatively greater amount of rural areas. Most land along the alternative is rural residential, agricultural, and forest land. Of the action alternatives, the East Alternative would cross the highest amount of land being used for timber production. About 85 percent of the land is privately owned, and WDNR (14 percent) and city and county governments (less than 1 percent) own the remaining land. The East Alternative would have the lowest number of homes within various distances from the edge of the right-of-way (see Table 5-1).



5.2.6.1 Land Ownership

The East Alternative would require new right-of-way for transmission lines and new and improved access roads. BPA would need to purchase easement rights for the new transmission line right-of-way and new and improved access roads. BPA would acquire new easements on up to 2,376 acres for these project elements (see Table 5-2). Acreage amounts for new easements for improved roads would depend on whether BPA already owns easement rights on these roads. If BPA has existing rights on some of the improved roads, the new easement requirement would be less than 2, 376 acres. Most land potentially subject to new easements in the East Alternative is privately held (1,993 acres). About 387 acres of public land would also be subject to easements; 358 acres are owned by WDNR. About 18 acres of a municipal watershed managed by the city of Camas (City of Camas Watershed) would be impacted by new easement. Portions of the line built on an existing easement would cause a **low-to-moderate** impact on landowners. The remaining portions that would require new right-of-way and easements restricting use would cause **high** impact on landowners.

5.2.6.2 Land Use

The East Alternative would use about 117 acres of existing right-of-way for about 8 miles (see Table 5-3; the 117 acres is the total of the acreages in “Existing Right-of-Way” columns for each land use type for the East Alternative). In addition, about 1,255 acres of new right-of-way would be needed for the alternative (see Table 5-2). Most of this new right-of-way (1,020 acres) would be on timber production lands. Outside the new 150-foot right-of-way, new and improved access roads and tower removal or construction on adjacent existing BPA right-of-way would affect an additional 476 acres. Most is open space or timber production land. The remaining is a mixture of urban/suburban, rural, and agricultural land.

Urban/Suburban

Urban/suburban lands are about 1 percent of the land crossed by the East Alternative. The alternative passes through commercial, industrial, and residential areas in or near Castle Rock, Camas, and Washougal. The East Alternative would require about 12 acres of new right-of-way in urban/suburban areas. About 8 acres of existing right-of-way would be affected by the new line. An additional 2 acres of urban/suburban land outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way. Impacts would be similar to the Central Alternative (see Central Alternative, Urban/Suburban).

Rural

Rural lands are about 2 percent of the land crossed by the East Alternative; most is low-density rural residential or undeveloped land.

About 10 acres of rural land would be crossed by new right-of-way, and about 20 acres of rural land on existing right-of-way would be crossed by the project. An additional 12 acres outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way.

Impacts on rural uses and limitations on development in areas of new and existing right-of-way would be similar to the West Alternative (see West Alternative, Rural).

Timber Production

Timber production lands are about 72 percent of the East Alternative, a higher percentage than any other action alternative. Similar to the Central Alternative, most of the land cleared by the East Alternative is timber production land owned by large landowners such as Weyerhaeuser and Longview Timber. About 1,020 acres of timber production land would be cleared for new right-of-way. Existing right-of-way does not cross timber production land. An additional 319 acres outside the new 150-foot right-of-way would be affected by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way.

Impacts on timber production and limitations on development, access, and potential for stranded use in areas of new and existing right-of-way would be similar to the Central Alternative (see Central Alternative, Timber Production).

Agriculture

Similar to the Central Alternative, agricultural lands make up about 3 percent of land crossed by the East Alternative. About 12 acres of agricultural land would be crossed by new right-of-way, and about 23 acres of existing right-of-way would be affected in the southern portion of the project area north of Washougal. An additional 11 acres outside the new 150-foot right-of-way would be affected or changed from this use by new and improved access roads and by tower removal or construction on adjacent, existing BPA right-of-way.

Impacts on agriculture, and limitations on development and to access would be similar to the Central Alternative (see Central Alternative, Agriculture).

The East Alternative crosses both prime farmland and farmland of statewide importance. The towers and new and improved access roads would require about 19 acres of prime farmland and 211 acres of farmland of statewide importance, totaling about 41 percent of the area within the East Alternative with these state designations. This is the greatest amount of this type of land crossed of the action alternatives. However, only about 6 acres of the 230 acres are currently classified as agriculture, so the East Alternative would only remove about 1 percent of agricultural lands designated as prime farmland and farmland of statewide importance.

Open Space

Open space lands are about 22 percent of the land crossed by the East Alternative. Open space along the East Alternative includes non-production forested areas (non-production and likely some production by small landowners) and non-forested land. Open space also includes some designated recreation areas such as the Yacont Burn State Forest (see Chapter 6, Recreation). New right-of-way required for the East Alternative would affect about 201 acres of open space land, and 132 acres outside the new 150-foot right-of-way would be affected or changed from open space use by new and improved access roads and by tower removal or construction on adjacent existing BPA right-of-way. In addition, 66 acres of existing right-of-way would be cleared.

Impacts to open space land would be similar to those discussed in the Central Alternative (see Central Alternative, Open Space).

5.2.6.3 East Option 1

East Option 1 begins at the Monahan Creek substation site and would remove the portion of the East Alternative crossing the Cowlitz River north of Castle Rock. The option would use segments southeast of the Monahan Creek substation site that run through sparsely populated land, cross the Cowlitz River and I-5 and run through largely unpopulated land toward the east. The option would reduce the amount of private land needed for new right-of-way easements by 74 acres (see Table 5-2). There would be no net change for public land.



East Option 1 would affect an additional 11 acres of rural land and about 53 acres of open space land. The option would reduce the amount of urban/suburban land crossed by about 9 acres, agricultural land by about 6 acres, and timber production land by about 67 acres (see Table 5-3). The option would decrease the area of prime farmland and farmland of statewide importance in agriculture needed for the project by about 1 acre.

Impact levels to land ownership and land use would be the same as the East Alternative.

5.2.6.4 East Option 2

East Option 2 would replace a portion of the East Alternative between Yale and the rural residential areas north of Camas with a route farther to the west. The option would decrease private land needed for new right-of-way easement by 182 acres but would increase



public land needed by 31 acres (see Table 5-2). The option would decrease impacts on the City of Camas Watershed by 8 acres.

East Option 2 crosses a similar amount of urban/suburban, rural, and open space land. Impacts on timber production land cleared by the project would be reduced by about 51 acres and a little over 2 fewer acres of agricultural land would be crossed (see Table 5-3). The option would reduce the area of prime farmland and farmland of statewide importance in agricultural use needed for the project by less than 1 acre.

Impact levels to land ownership and land use would be the same as the East Alternative.

5.2.6.5 East Option 3

East Option 3 would replace a short portion of the alternative in unpopulated land with a new route through unpopulated land. The option would decrease the private land needed for new right-of-way by 15 acres, and would increase the WDNR land needed by 24 acres (see Table 5-2). The City of Camas Watershed would not be impacted by new right-of-way using this option.



East Option 3 crosses the same amount of urban/suburban, rural, and agricultural land as the East Alternative. The option would clear an additional 23 acres of timber production land. It would also cross about 5 fewer acres of open space land (see Table 5-3). This option would not change the area of prime farmland and farmland of statewide importance in agricultural use needed for the project.

Impact levels to land ownership and land use would be the same as the East Alternative.

5.2.7 Crossover Alternative

The Crossover Alternative would parallel existing transmission lines for about 33 miles (almost 45 percent of the total distance) and would require new right-of-way for the remaining approximately 41 miles of its total 74-mile length. Similar to the Central and East alternatives, it passes through some urban and suburban areas near the beginning and end of its length, but there is a smaller amount of these areas and lower residential property densities due to a relatively greater amount of rural areas. Most land along the alternative is rural residential, agricultural, and forest land. Of the action alternatives, the Crossover Alternative would cross the third highest amount of land being used for timber production. About 79 percent of the land is privately owned. The remaining land is owned by WDNR (20 percent) and city and county governments (less than 1 percent). The Crossover Alternative would have the second highest number of homes within various distances from the edge of the right-of-way (see Table 5-1).



5.2.7.1 Land Ownership

The Crossover Alternative would require new right-of-way for transmission lines and new and improved access roads. BPA would need to purchase easement rights for the new transmission line right-of-way and new and improved access roads. BPA would acquire new easements on up to 1,420 acres for these project elements (see Table 5-2). Acreage amounts for new easements for improved roads would depend on whether BPA already owns easement rights on these roads. If BPA has existing rights on some of the improved roads, the new easement required would be less than 1,420 acres. Most land potentially subject to new easements in the Central Alternative is privately held (972 acres), and 449 of the affected acres are publicly owned. About 422 acres of public land crossed by the project is on WDNR property and the remaining is on county land. Similar to the Central and East alternatives, most land potentially subject to new easements is timber production or open space land, including designated open space. Portions of the line built on an existing easement would cause a **low-to-moderate** impact on landowners. The remaining portions that would require new right-of-way and easements restricting use would cause **high** impact on landowners.

5.2.7.2 Land Use

The Crossover Alternative would use about 571 acres of existing right-of-way for about 33 miles (see Table 5-3; the 571 acres is the total of the acreages in the “Existing Right-of-Way” columns for each land use type for the Crossover Alternative). In addition, about 772 acres of new right-of-way would be needed for this alternative (see Table 5-2). Most new right-of-way (627 acres) would be on timber production lands (see Table 5-2). An additional 286 acres outside the 150-foot right-of-way for the new line would be affected by new and improved access roads, and by tower removal or construction on adjacent BPA right-of-way. The remaining land is a mixture of urban/suburban, rural, and agricultural land.

Urban/Suburban

Urban/suburban lands are about 1 percent of the area affected by the Crossover Alternative. Most of the urban/suburban land is residential and or developed with industrial uses areas near Lexington, Camas, and Washougal.

Almost 3 acres of new right-of-way would be needed, and about 20 acres of existing BPA vacant right-of-way would be affected by the new line. An additional 2 acres of urban/suburban land outside the 150-foot right-of-way for the new line would be affected by new and improved access roads, and by tower removal or construction on adjacent BPA right-of-way.

Impacts on urban/suburban land uses and limitations on development in areas of new and existing right-of-way would be similar to the West Alternative (see West Alternative, Urban/Suburban).

Rural

Rural lands are about 7 percent of the land crossed by the Crossover Alternative; most is low-density rural residential or undeveloped.

About 3 acres of rural land would be cleared for new right-of-way. About 59 acres of existing right-of-way would be cleared as needed, and would remain rural in character after project construction. About 10 acres outside the 150-foot right-of-way for the new line would be affected by new and improved access roads and by tower removal, or construction on adjacent BPA right-of-way.

Impacts on rural uses and limitations on development in areas of new and existing right-of-way would be similar to the West Alternative (see West Alternative, Rural).

Timber Production

Timber production lands are about 48 percent of the Crossover Alternative; most is owned by large landowners such as Weyerhaeuser, Longview Timber, and WDNR.

About 627 acres of timber production land would be cleared for new right-of-way. Existing right-of-way does not cross timber production land. About 160 acres outside the 150-foot right-of-way for the new line would be affected by new and improved access roads, and by tower removal or construction on adjacent BPA right-of-way.

Impacts on timber production and limitations on future timber harvest in those areas and on adjacent properties would be similar to the Central Alternative (see Central Alternative, Timber Production).

Agriculture

Agricultural lands are about 3 percent of the land crossed by the Crossover Alternative.

New right-of-way required for the Crossover Alternative would affect about 3 acres of agricultural land. About 39 acres of existing right-of-way would be affected. About 9 acres of agricultural land outside the 150-foot right-of-way for the new line would be affected by new and improved access roads, and by tower removal or construction on adjacent BPA right-of-way.

Impacts on agriculture, and limitations on development and to access would be similar to the Central Alternative (see Central Alternative, Agriculture).

The Crossover Alternative crosses both prime farmland and farmland of statewide importance. Towers and new and improved access roads would cover about 26 acres of prime farmland and 142 acres of farmland of statewide importance, totaling about 21.2 percent of the area within the Crossover Alternative with these state designations. However, only about 5 acres of the 168 acres are currently designated as agriculture, so the Crossover Alternative would only remove about 1 percent of agricultural lands designated as prime farmland and farmland of statewide importance.

Open Space

Open space lands are about 43 percent of the land crossed by the Crossover Alternative. Open space along the Crossover Alternative includes non-production forested areas (non-production and likely some production by small landowners) and non-forested land. Open space also includes some designated recreation areas such as the Yacolt Burn State Forest (see Chapter 6, **Recreation**).

About 136 acres of open space land would be crossed by new right-of-way. About 453 acres of existing right-of-way in open spaced lands would be cleared as needed. About 105 acres outside the new 150-foot right-of-way would be affected by new and improved access roads, and by tower removal or construction on adjacent, existing BPA right-of-way.

Impacts to open space lands would be similar to those discussed in the Central Alternative (see Central Alternative, Open Space).

5.2.7.3 Crossover Option 1

Crossover Option 1 would remove a portion of the alternative crossing north–south through rural residential areas north of Camas between NE Zeek Road and SE 23rd Street, and replace it with a route running west along an existing right-of-way until about NE 232nd Avenue, then southeast through open fields and more rural residential areas. The option would increase private land needed for right-of-way and access road easements by about 60 acres (see Table 5-2). There would be no change in public land required.



Crossover Option 1 would affect about an acre more of urban/suburban land, 55 more acres of agricultural land, and about 46 more acres of open space land near the Little Washougal River and north of Lacamas Lake. This option would not change the amount of timber production land cleared, and would reduce the amount of rural land crossed by about almost 4 acres (see Table 5-3). The option would increase the area of prime farmland and farmland of statewide importance in agricultural use needed by about 10 acres.

Impact levels to land ownership and land use would be the same as the Crossover Alternative.

5.2.7.4 Crossover Option 2

Crossover Option 2 would begin at the Baxter Road substation site and the new transmission line would cross sparsely populated land. The option would increase private land required for right-of-way and easements by about 42 acres (see Table 5-2).



Crossover Option 2 would add about 4 acres of timber production land and 76 acres of open space land to the area crossed, most near the Baxter Road substation site. There would be no change to the amount of urban/suburban or agricultural land crossed, but there would be a 18-acre increase in the amount of rural land crossed (see Table 5-3). The option would not change the area of prime farmland and farmland of statewide importance in agricultural use needed for the project.

Impact levels to land ownership and land use would be the same as the Crossover Alternative.

5.2.7.5 Crossover Option 3

Crossover Option 3 would begin at the Baxter Road substation site and the new transmission line would cross sparsely populated land and require some additional new right-of-way. The option would increase private land needed for new right-of-way and easements by about 85 acres (see Table 5-2).



Crossover Option 3 would add about 22 acres of timber production land and 56 acres of open space land to the area crossed, most near the Baxter Road substation site. There would be no change in the amount of urban/suburban or agricultural land crossed, and there would be a little over 15-acre increase of rural land crossed (see Table 5-3). The option would not change the area of prime farmland and farmland of statewide importance in agricultural use needed for the project.

Impact levels to land ownership and land use would be the same as the Crossover Alternative.

5.2.8 Recommended Mitigation Measures

Mitigation measures included as part of the project are identified in Table 3-2. The following additional land use mitigation measures have been identified to further reduce or eliminate adverse land use impacts by the action alternatives. If implemented, these measures would be completed before, during, or immediately after project construction, unless otherwise noted.

- Build new permanent access roads along the edges of clearings, pastures or small farms to minimize disturbance.
- Closely coordinate with and notify landowners or land managers regarding work scheduling and associated impacts.
- Where cattle, horses, and other livestock are present, ensure gates and fences remain closed during construction and maintenance activities.
- Consider special agreements with rural landowners to allow growing ornamental and orchard trees or other crops that do not interfere with operation or maintenance of facilities on the right-of-way.
- Provide a schedule of construction activities to landowners that could be affected by clearing of and construction within the right-of-way.
- Work with private landowners and WDNR concerning a possible cooperative agreement to control unauthorized public access or use on private or public lands that could result from the project. The agreement could address various provisions related to unauthorized access, such as additional measures to be taken to discourage unauthorized use of right-of-way and access roads, periodic inspection for unauthorized access, and damages from unauthorized access.

5.2.9 Unavoidable Impacts

All existing land uses crossed by the new right-of-way that are inconsistent with right-of-way management and safety would be prohibited for the life of the project. All existing structures and activities currently located, or occurring, in the existing right-of-way to be used by the project that are not consistent with right-of-way management and safety would be removed or prohibited without compensation to the user.

New access roads would create a new land use that may be consistent with or similar to existing uses in urban and commercial areas, but may be inconsistent with residential or rural land uses, especially during construction. New or improved access roads could continue, increase, or create new opportunities for unauthorized access to, or use of, public or private land.

Operational maintenance and inspection activities would occur once or twice per year.

5.2.10 No Action Alternative

Under the No Action Alternative, the project would not be constructed and there would be **no** impact on land use. Similar land use activities would continue to occur in the project area including existing roads, substations and transmission lines and maintenance activities on those facilities. All other existing land uses would also continue to occur such as timber harvest, agriculture, recreation, and urban and rural development.