

## **Appendix A**

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# **Washington Department of Natural Resources Lands Analysis**



# Appendix A Washington Department of Natural Resources Lands Analysis

The Washington State Energy Facility Site Evaluation Council (EFSEC) and the Oregon Department of Energy (ODOE) have provided Bonneville Power Administration (BPA) with state substantive standards that they believe are potentially applicable and should be addressed in this environmental impact statement (EIS). Inclusion of these standards in the EIS (Chapter 28, Consistency with State Substantive Standards) helps BPA and state agencies in their review of the project. By identifying and considering these standards as early as possible, the project can be designed to be consistent or compatible with them to the maximum extent practicable.

BPA recognizes that, when a state owns property that BPA proposes to cross with any facilities, the state agency managing that property may need to comply with certain state or local laws or regulations before it can agree to allow BPA use of their property. As discussed in Chapter 5, Land, Washington Department of Natural Resources (WDNR) is a state agency that manages property crossed by the action alternatives. To assist WDNR in its compliance efforts, BPA has included this Appendix A to provide additional information, where available, for these lands.

BPA and WDNR have signed a Mitigation Agreement that sets the foundation for future agreements specific to future projects or applicable to all land use actions between BPA and WDNR (May 2010). Section 4 of the agreement committed BPA and WDNR to enter into a Statewide Rights-of-Way Memorandum of Agreement (Statewide MOA) that covers all WDNR managed state lands in the state of Washington. This Statewide MOA covers specific issues related to all WDNR lands that are encumbered with BPA easements. Some of the information included in this appendix reflects agreements made in the MOA. The Statewide MOA addresses BPA transmission line operations and maintenance compatibility with trust land management and was signed by BPA and WDNR in March 2012. The Statewide MOA is formally titled Memorandum of Agreement between Washington State Department of Natural Resources and the Bonneville Power Administration, Department of Energy for Managing Impacts to State Lands from BPA Transmission Line and Access Road Easements. The following elements are addressed in the MOA:

- Integration of state and federal requirements
- Danger trees
- Vegetation management
- Noxious Weed Control and Management
- Access road management, maintenance, repair, and cost sharing
- Environmental and Resource Protection
- Dispute resolution
- Communications/notification
- Liability

- Situations where additional right-of-way and/or mitigation is needed for transmission operations, such as safety zones and vegetation removal for clear safe backlines
- Third party use (authorized and unauthorized)
- Safety

This appendix also reflects an Appraisal Memorandum of Understanding (Appraisal MOU) between BPA and WDNR. The Appraisal MOU was finalized on August 1, 2010 and describes the process BPA would use to appraise WDNR lands crossed by the proposed project.

The following sections of this appendix provide more detailed information on WDNR lands relevant to the I-5 project. Section A.1 describes WDNR land ownership that could be affected by the project; Section A.2 discusses potential impacts to WDNR land; and Section A.3 lists possible measures that could be undertaken before, during, or after project construction to lessen or avoid these potential impacts.

## A.1 Washington Department of Natural Resources Land Potentially Affected

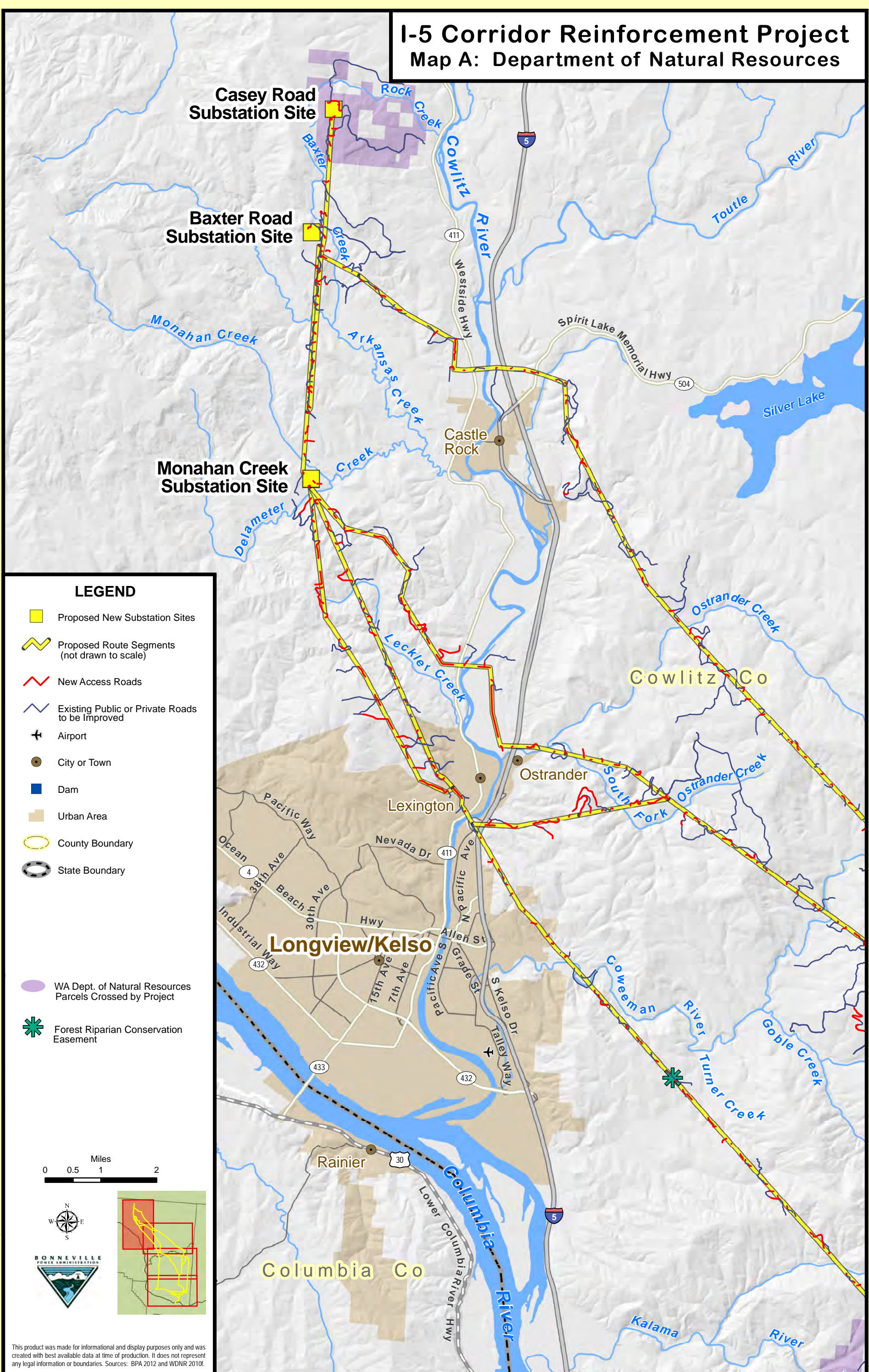
WDNR manages land in the project area, including land that would be crossed by the action alternatives (see Maps A through D and Table A-1). WDNR manages land for many purposes, including protection of state and federal threatened and endangered species, revenue for school construction, revenue for other state facilities, and environmental protection.

**Table A-1 WDNR Parcels Potentially Crossed by Alternatives or Options in the Project Area<sup>1</sup>**













WDNR Parcel Number	Alternative, Option, or Substation	Route Segment or Access Road
111253	Central	10
92	Central	10
11578	Central	12
11580	Central	12
13438	Central	12
11577	Central	12
11576	Central	12
15529	Crossover	14
11609	Central and Crossover	15
15253	Central and Crossover	15
11611	Central and Crossover	15
110022	Central and Crossover	18
11616	Central and Crossover	18
11649	Central and Crossover	18
11651	Central and Crossover	18
7925	Central and Crossover	18

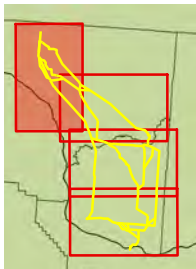
# I-5 Corridor Reinforcement Project

## Map A: Department of Natural Resources



### LEGEND

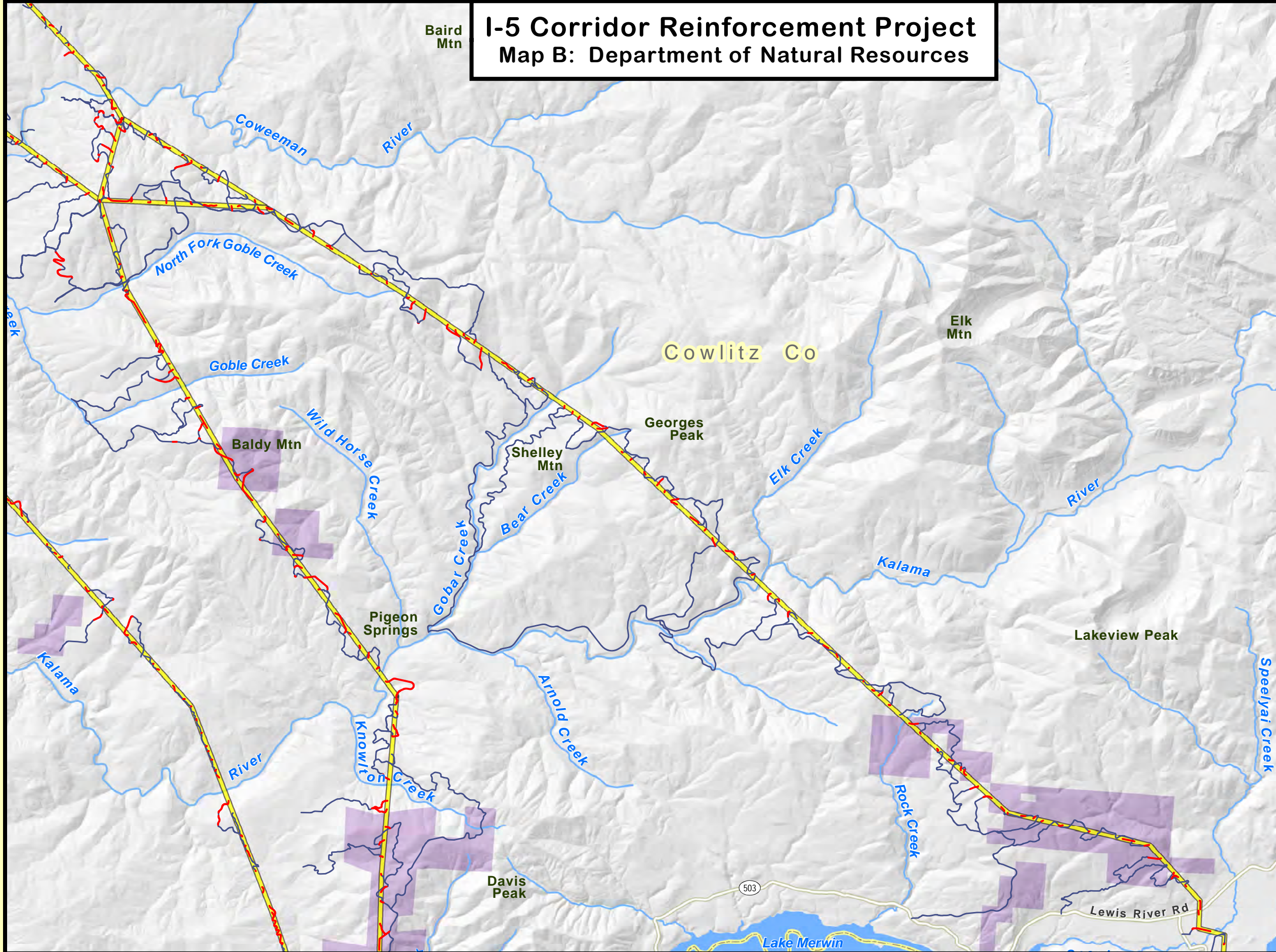
-  Proposed New Substation Sites
-  Proposed Route Segments (not drawn to scale)
-  New Access Roads
-  Existing Public or Private Roads to be Improved
-  Airport
-  City or Town
-  Dam
-  Urban Area
-  County Boundary
-  State Boundary
-  WA Dept. of Natural Resources Parcels Crossed by Project
-  Forest Riparian Conservation Easement



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# I-5 Corridor Reinforcement Project

## Map B: Department of Natural Resources



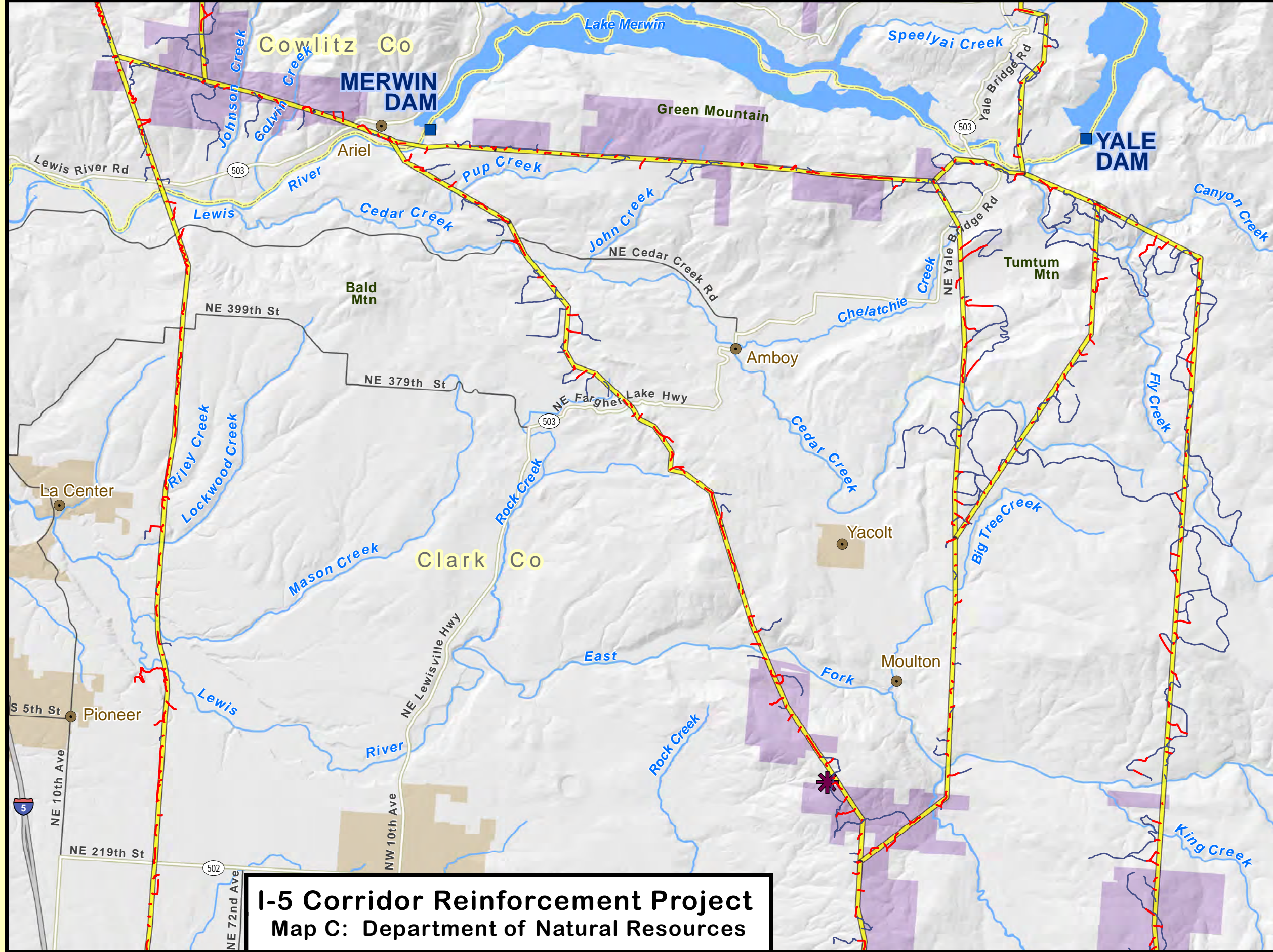
### LEGEND

- Proposed New Substation Sites
- Proposed Route Segments (not drawn to scale)
- New Access Roads
- Existing Public or Private Roads to be Improved
- Airport
- City or Town
- Dam
- Urban Area
- County Boundary
- State Boundary
- WA Dept. of Natural Resources Parcels Crossed by Project

Miles  
0 0.5 1 2

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Map B: Department of Natural Resources



### LEGEND

- Proposed New Substation Sites
- Proposed Route Segments (not drawn to scale)
- New Access Roads
- Existing Public or Private Roads to be Improved
- Airport
- City or Town
- Dam
- Urban Area
- County Boundary
- State Boundary
- WA Dept. of Natural Resources Parcels Crossed by Project
- Genetic Research Plots

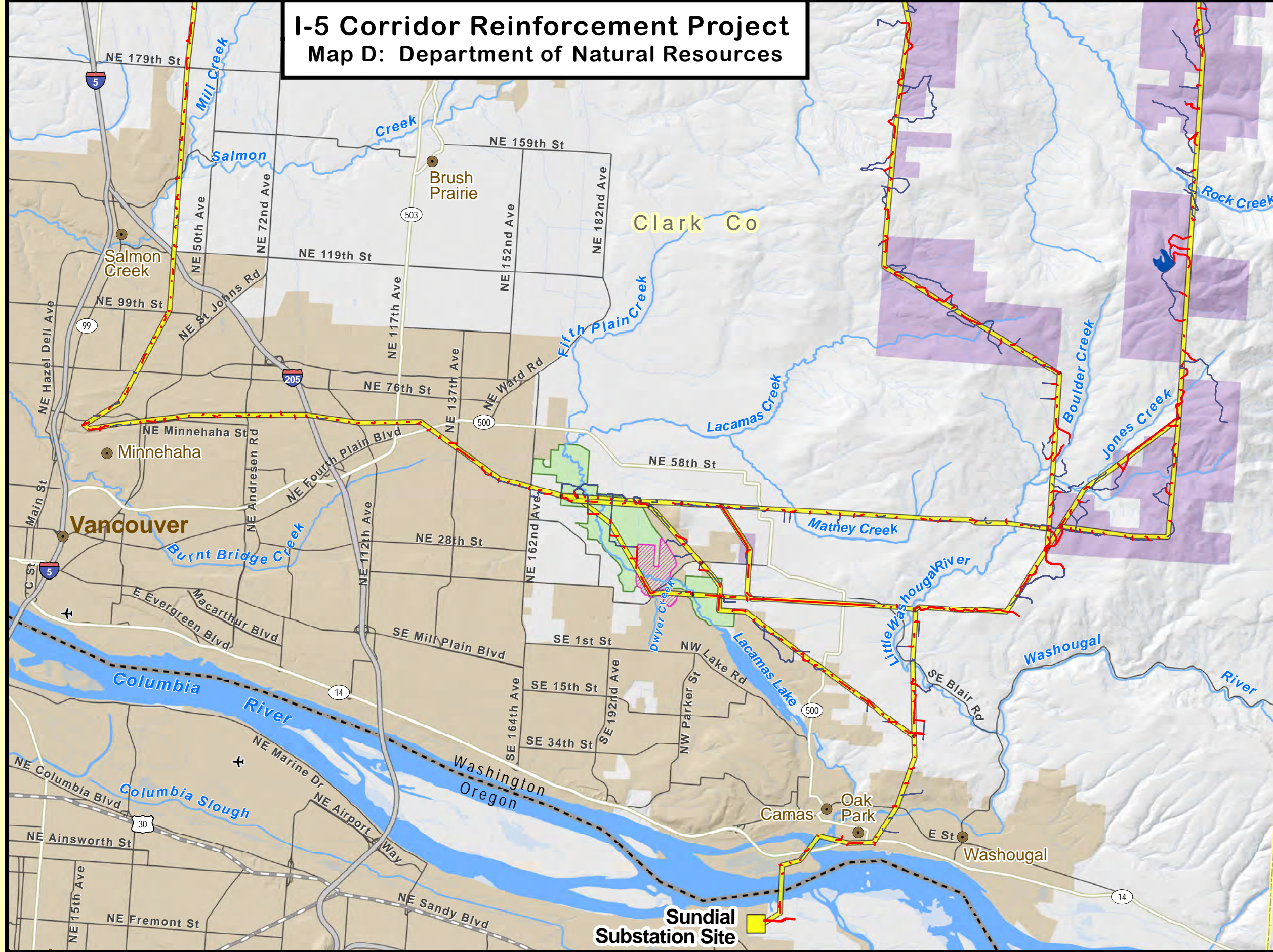
Miles  
0 0.5 1 2

**I-5 Corridor Reinforcement Project  
Map C: Department of Natural Resources**

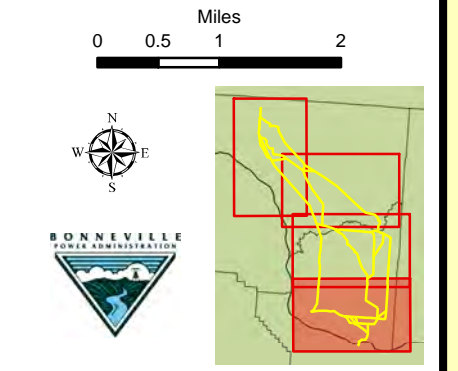
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# I-5 Corridor Reinforcement Project

## Map D: Department of Natural Resources



- ### LEGEND
- Proposed New Substation Sites
  - Proposed Route Segments (not drawn to scale)
  - New Access Roads
  - Existing Public or Private Roads to be Improved
  - Airport
  - City or Town
  - Dam
  - Urban Area
  - County Boundary
  - State Boundary
  - WA Dept. of Natural Resources Parcels Crossed by Project
  - Herbaceous Bald
  - Lands Eligible for inclusion in National Resource Conservation Area (NCRA)
  - Lands Eligible for inclusion in Natural Area Preserve (NAP)



This product was made for informational and display purposes only and was created with best available data at time of production. It does not represent any legal information or boundaries. Sources: BPA 2012 and WDNR 2010f.

Map D: Department of Natural Resources



WDNR Parcel Number	Alternative, Option, or Substation	Route Segment or Access Road
11648	Central and Crossover	18
11614	Central and Crossover	18
11656	Central and Crossover	18
7927	Central and Crossover	18
7930	Central and Crossover	18
10753	West	25
7911	Central Option 3	30
7905	Central Option 3	30
7923	Central Option 3	30
7910	Central Option 3	30
7921	Central Option 3	30
7913	Central Option 3	30
7918	Central Option 3	30
7915	Central Option 3	30
7879	West Option 2	43
56	Central Option 1, Casey Road Substation	A
11619	East	K
11628	East	K
8109	East	K
15535	East	K
11620	East	K
11627	East	K
11618	East	K
11624	East	K
11626	East	K
15108	Central and Crossover	L
11653	Crossover	N
54	Central, Casey Road Substation	new road to Casey Road Substation
53	Central, Casey Road Substation	new road to Casey Road Substation
7904	Central Option 3	new road on Segment 30
8023	East and Crossover	new road on Segment O
7982	East and Crossover	O
8001	East and Crossover	O
7947	East and Crossover	O
13030	East and Crossover	O

<b>WDNR Parcel Number</b>	<b>Alternative, Option, or Substation</b>	<b>Route Segment or Access Road</b>
111730	East and Crossover	O
7948	East and Crossover	O
7980	East and Crossover	O
8072	East and Crossover	O
7946	East and Crossover	O
8007	East and Crossover	O
7981	East and Crossover	O
7979	East and Crossover	O
8032	East and Crossover	O
8040	Central and East Option 2	P
15587	Central and East Option 2	P
7885	Central and East Option 2	P
7894	Central and East Option 2	P
7884	Central and East Option 2	P
7886	Central and East Option 2	P
8041	Central and East Option 2	P
7963	East and Crossover	Q
7951	East and Crossover	Q
7952	East Option 3	R
7962	East Option 3	R
8719	Central	improve road to Casey Road Substation
11556	Central	improve road to Casey Road Substation
50	Central	improve road to Casey Road Substation
51	Central	improve road to Casey Road Substation
52	Central	improve road to Casey Road Substation
111252	Central	improve road on Segment 10
11595	Central	improve road on Segment 12
11579	Central	improve road on Segment 12
11570	Central	improve road on Segment 12
7928	Central and Crossover	improve road on Segment 18
5	West and Crossover	improve road on Segment 9
58	Central	improve road on Segment A
60	Central	improve road on Segment A
57	Central	improve road on Segment A
15536	East	improve road on Segment K
11636	East	improve road on Segment K
11631	East	improve road on Segment K

WDNR Parcel Number	Alternative, Option, or Substation	Route Segment or Access Road
8073	East and Crossover	improve road on Segment O
13031	East and Crossover	improve road on Segment O
8033	East and Crossover	improve road on Segment O
7999	East and Crossover	improve road on Segment O
8024	East and Crossover	improve road on Segment O
8025	East and Crossover	improve road on Segment O
8042	East and Crossover	improve road on Segment O
8039	Central and East Option 2	improve road on Segment P
7961	East Option 3	improve road on Segment R
7960	East Option 3	improve road on Segment R
8067	Central and East Option 2	V
7919	Central and East Option 2	V

Notes:  
1. Includes a 150-foot right-of-way that extends 75 feet on either side of the proposed centerline of the alternatives, a footprint for the substations, tower disturbance areas for towers outside the 150-foot right-of-way that would be removed or rebuilt, and a 30- and 20-foot easement for new and improved access roads outside of the transmission line right-of-way (some easements already exist with WDNR for existing access roads identified for improvement). Note that impacts from clearing beyond the 150-foot right-of-way would occur for danger tree and safety backline (see Chapter 3), but the impact to additional WDNR parcels is unknown at this time.  
Source: WDNR 2010c

About 8 to 492 acres of WDNR land would potentially be crossed by the action alternatives (see Table A-2). Permanent impacts on WDNR land would occur from construction of towers, access roads, substations, and clearing of new right-of-way (see Table A-3). Clearing of additional vegetation for danger trees or safety backline outside of new and existing right-of-way could occur but the amount is unknown at this time. Temporary disturbance at pulling and tensioning sites outside of right-of-way and staging areas could occur on WDNR land although the locations are not known at this time.

**Table A-2 WDNR Land Ownership in the Project Area<sup>1</sup> (Acres)**

Alternatives and Options <sup>2</sup>	WDNR Land
<b>West Alternative</b>	<b>8</b>
West Option 1	N/C
West Option 2	+11
West Option 3	+8
<b>Central Alternative</b>	<b>492</b>
Central Option 1	+96
Central Option 2	N/C
Central Option 3	-90
<b>East Alternative</b>	<b>273</b>
East Option 1	N/C
East Option 2	+48

Alternatives and Options <sup>2</sup>	WDNR Land
East Option 3	+47
<b>Crossover Alternative</b>	<b>353</b>
Crossover Option 1	N/C
Crossover Option 2	N/C
Crossover Option 3	N/C
Notes: N/C – No change from the action alternative. 1. Includes a 150-foot right-of-way that extends 75 feet on either side of the proposed centerline of the alternatives, a footprint for the substations, tower disturbance areas for towers outside the 150-foot right-of-way that would be removed or rebuilt, and a 30- and 20-foot easement for new and improved access roads outside of the transmission line right-of-way (some easements already exist with WDNR for existing access roads identified for improvement). Note that impacts from clearing beyond the 150-foot right-of-way would occur for danger tree and safety backline (see Chapter 3), but the exact amount and type of clearing is unknown at this time. 2. The value for each option represents the net change from the alternative. It was calculated as the acres of WDNR ownership added by the option minus the acres of WDNR ownership in the segments the option replaces. Source: BLM 2009	

**Table A-3 Permanent Impacts to WDNR Land in the Project Area (Acres)**

Alternatives and Options <sup>1</sup>	Substation <sup>2</sup>	Transmission Line Right-of-Way <sup>3</sup>	Towers <sup>4</sup>	New Access Roads <sup>5</sup>	Improved Access Roads <sup>5</sup>	Total Permanent Impacts
<b>West Alternative</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>&lt;1</b>	<b>8</b>
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	+10	N/C	+<1	+1	+11
West Option 3	N/C	+6	N/C	+2	+<1	+8
<b>Central Alternative</b>	<b>0</b>	<b>411</b>	<b>0</b>	<b>23</b>	<b>58</b>	<b>492</b>
Central Option 1	+63	+15	+1	+2	+15	+96
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	-87	N/C	+1	-4	-90
<b>East Alternative</b>	<b>0</b>	<b>207</b>	<b>0</b>	<b>18</b>	<b>48</b>	<b>273</b>
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	N/C	+56	N/C	-4	-4	+48
East Option 3	N/C	+44	N/C	+1	+2	+47
<b>Crossover Alternative</b>	<b>0</b>	<b>295</b>	<b>0</b>	<b>21</b>	<b>37</b>	<b>353</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C
Notes: N/C – No change from the action alternative. 1. The value for each option represents the net change from the alternative. It was calculated as acres added by the option minus the acres in the segments the option replaces. 2. Includes towers and access roads within the substation footprint. 3. Includes area of existing and new transmission line right-of-way that would be needed for the project. 4. Includes towers outside of the substation footprint and 150-foot-wide right-of-way needing to be removed or rebuilt. 5. Based on an average 30- and 20-foot easement that would be needed for new or improved access roads. Includes access roads outside of the substation area and 150-foot right-of-way. Source: BLM 2009						

## A.2 Resource Impacts

The following discussions address the environmental resources affected by the project to aid WDNR in its statutory and regulatory compliance efforts for its lands. General resource impacts from the project are described in Chapters 5 through 22 of this EIS, including impacts on environmental resources not specifically addressed in this appendix, including on WDNR land. The information below addresses the site-specific impacts on WDNR land, to the extent they have been identified. Once a preferred alternative is selected and focused field surveys are conducted, additional site-specific impacts may be identified.

### A.2.1 Land Use

Chapter 5 of the EIS provides an analysis of potential project impacts on land use, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land. Existing land uses on WDNR land the project could cross include rural, timber production, agriculture, and open space (which includes both forested and non-forested areas) (see Table A-4).

**Table A-4 Land Use on WDNR Land in the Project Area (Acres)**

Alternatives and Options <sup>1</sup>	Urban/Suburban	Rural	Timber Production	Open Space	Agriculture	Total
<b>West Alternative</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>8</b>
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	+11	N/C	N/C	+11
West Option 3	N/C	N/C	+8	+<1	N/C	+8
<b>Central Alternative</b>	<b>0</b>	<b>&lt;1</b>	<b>480</b>	<b>11</b>	<b>&lt;1</b>	<b>492</b>
Central Option 1	N/C	N/C	+59	+36	+<1	+96
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-90	-<1	+1	-90
<b>East Alternative</b>	<b>0</b>	<b>1</b>	<b>262</b>	<b>10</b>	<b>&lt;1</b>	<b>273</b>
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	N/C	+<1	+50	-1	-<1	+48
East Option 3	N/C	N/C	+36	+11	N/C	+47
<b>Crossover Alternative</b>	<b>0</b>	<b>&lt;1</b>	<b>345</b>	<b>8</b>	<b>&lt;1</b>	<b>353</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C
Notes:						
N/C – No change from the action alternative.						
1. The value for each option represents the net change from the alternative. It was calculated as acres added by the option minus the acres in the segments the option replaces.						
Sources: Herrera 2010, USGS 2011						

Impacts on WDNR land include the creation of incompatible land uses related to conversion of active timber production lands to non-timber production land, use of open space land for project components, and disturbance to WDNR lands during maintenance and construction activities.

Use of WDNR land would be limited within the transmission line right-of-way and other uses would be eliminated at substations or under roads and tower footprints. Restrictions would include keeping the right-of-way clear of all structures, fire hazards, and tall-growing vegetation, and preventing any other use that may interfere with the safe operation or maintenance of the line. BPA would obtain the right, via its easements, to keep the right-of-way clear of vegetation and structures; BPA could also enter into agreements with WDNR for low-growing vegetation that does not interfere with BPA's safe operation and maintenance of its transmission facilities. WDNR would coordinate with BPA prior to planting to ensure that the use is safe, compatible, and does not create interference. Non-woody, non-structure supported (i.e., trellised) vegetation with a mature height not to exceed 4 feet could be grown safely under the transmission line. However, orchards, Christmas trees, tall-growing landscape or natural vegetation, and structure-supported crops would require special consideration.

Grazing land tends to be compatible with transmission lines, because livestock would be able to graze within the right-of-way. Although tower footprints and road beds would occupy land and remove that area of vegetation from grazing, livestock and wildlife could still walk around the towers and roads to access WDNR open space used for grazing that would be affected by the project.

Some uses of the right-of-way would not be restricted, but certain precautions would need to be taken. For example, in general, no object should be raised higher than 14 feet above the ground within the right-of-way (i.e., when moving timber harvest equipment underneath the right-of-way); ground elevation should not be altered (such as piling of dirt within the right of way); irrigation spray should not create a continuous stream onto the conductors or towers; fences should be grounded; and installing underground pipes or cables through the right-of-way needs to be coordinated with BPA so that they do not interfere with transmission line grounding systems. Vehicles and large equipment such as cranes, derricks and booms that do not extend more than 14 feet high could be operated safely under the line where it passes over roads, driveways, parking lots, cultivated fields or grazing lands.

BPA access roads could create an avenue for unauthorized access onto WDNR lands. At the request of WDNR, BPA would place gates at the entrance of access roads to prevent public access onto WDNR land and the project corridor. Locked gates at the entrances of BPA access roads and rights-of-way, which are installed for the life of the line and maintained by both BPA and WDNR, would help reduce trespassers, but could also cause a slight inconvenience to users of WDNR land.

There is the potential that, even with gates, unauthorized access and use of the right-of-way and adjacent properties could occur. WDNR has raised concerns about potential impacts to state lands from this unauthorized access and use. Because transmission line corridors are linear facilities that typically can be accessed fairly easily by the general public, WDNR is concerned that the project could contribute to unauthorized use and damage to state lands and public resources on these lands. WDNR also is concerned that gates by themselves are not sufficient to prevent unauthorized access and use to its lands where the project and associated roads

would be present. During construction and line maintenance, workers would need to ensure that gates are closed to prevent any livestock that may be grazing in the vicinity of WDNR land from escaping. Use of gates would also limit easy access to WDNR land by off-road vehicles.

In general, unauthorized public access and use could increase soil erosion and fire danger, introduce noxious weeds and illegal dumping, and disturb vegetation, wildlife, wildlife habitat, and cultural resources. Increased soil erosion could occur from unauthorized uses such as off road vehicles and other unmanaged recreational activities accessing areas and disturbing soils. Over time, unauthorized uses of gravel or dirt roads on WDNR land could lead to accelerated deterioration of these roads through disturbance and erosion. Increased fire danger can result from activities by unauthorized users on or near the project from a variety of means, such as campfires, discarded cigarettes, and vehicle exhaust systems coming into contact with vegetation.

The potential introduction of noxious weeds from unauthorized public access and use can occur from unauthorized vehicles inadvertently transporting and spreading seeds of noxious weeds into the project corridor and WDNR lands. Soil disturbance from these vehicles increases the potential for the introduced noxious weeds to become established in these disturbed areas. Such weed infestations would reduce the quality and value of WDNR land used for timber production, conservation, and preservation. They would also reduce forage quality of WDNR land, increase weed control costs, and threaten the integrity of native plant communities and habitats.

BPA would continue to work with WDNR concerning possible avenues for controlling or minimizing the potential for unauthorized public access and use on state lands to address WDNR's concerns about unauthorized access to its lands as a result of the project. Overall, maintenance impacts to WDNR land for the action alternatives would be low because the activities would not change land use; would be short term and limited to noise, dust and a small amount of vehicle traffic; and BPA would compensate for any damage that may occur. Timber harvest activities would not be affected by maintenance, other than possible minor scheduling conflicts that would be resolved by the parties involved through standard communication.

## A.2.2 Recreation

Chapter 6 of the EIS provides an analysis of potential project impacts on recreation resources, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land.

Recreation facilities on WDNR lands include parks, campgrounds, motorized trails, and non-motorized trails. Recreational activities on WDNR land include sightseeing, nature appreciation, off-highway vehicle riding, target practice, fishing, and hunting. Dispersed recreation also takes place outside of designated recreation facilities, and can be authorized or unauthorized, as is the case with some off-highway motorized vehicle use and target practice at the Casey Road substation site.

Trails on WDNR land in the Yacolt Burn State Forest crossed by the project include the following:

- **Tarbell Trail:** This trail is a 35-mile non-motorized trail system that is open to hikers, equestrians, and mountain bikers year-round (WDNR 2010).

- **Larch Mountain Trail:** This trail is used by hikers, equestrians, and mountain bikers to reach the summit of Larch Mountain from the Tarbell Trail (WDNR 2010).
- **Jones Creek Trail and Jones Creek Trail Connector A:** This 14-mile-long stretch of double-track motorcycle and all-terrain vehicle motorized trail is open seasonally from May 1 to November 30.

The East and Crossover alternatives would cross or otherwise affect WDNR recreation resources within the Western Yacolt Burn State Forest (see Table A-5). The Casey Road substation site has no WDNR trails, but unauthorized activities such as target practice do occur. No other substation sites would affect WDNR recreation resources.

**Table A-5 Permanent Impacts to Trails on WDNR Land in the Project Area<sup>1</sup>**

Alternatives and Options <sup>2</sup>	Towers <sup>3</sup> (miles)	New Access Roads <sup>4</sup> (miles)	Improved Access Roads <sup>4</sup> (miles)
East Alternative	Tarbell Trail (<0.1)	Tarbell Trail (0.1)	Jones Creek Trail (0.2), Tarbell Trail (<0.1)
East Option 1	N/C	N/C	N/C
East Option 2	Tarbell Trail (-<0.1)	Tarbell Trail (-0.1)	Jones Creek Trail (-0.2), Tarbell Trail (-<0.1)
East Option 3	Jones Creek Trail (+<0.1)	Jones Creek Trail Connector A (+<0.1)	Jones Creek Trail Connector A (+0.3), Jones Creek Trail (-0.2)
Crossover Alternative	Tarbell Trail (<0.1)	Tarbell Trail (0.1)	Jones Creek Trail (0.2), Tarbell Trail (<0.1)
Crossover Option 1	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C

Notes:  
 N/C – No change from the action alternative  
 1. The recreation study area is defined as the area within approximately 1,000 feet of the route.  
 2. The value for each option represents the net change from the action alternative. It was calculated as the total area added by the option minus the total area in the segments the option replaces.  
 3. Includes towers within and outside of the 150-foot right-of-way.  
 4. Includes access roads within and outside of the 150-foot right-of-way.  
 Source: Clark County 2011d

### A.2.3 Socioeconomics

Chapter 11 of the EIS provides an analysis of potential project impacts on socioeconomic resources, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land. The socioeconomic conditions and resources potentially affected by the project on WDNR land include public services and utilities, government revenue from timber production, values associated with recreation and tourism, and ecosystems.



WDNR provides fire protection for more than 12 million acres in Washington, including their lands in the project area. WDNR has mutual aid agreements with rural fire districts in Clark and Cowlitz counties, and a master agreement for sharing fire protection resources among all state and federal agencies. In the event of a large or unusual emergency, they would likely be able to call in additional personnel and equipment from these districts and agencies.

WDNR manages state trust lands to provide revenue for several trusts, primarily by producing timber. The revenue generated for those trusts statewide ranged from \$4 million to \$65 million in 2009 (see Table A-6).

**Table A-6 Washington State Trust Land, Beneficiaries, Acres, and Timber Sales, Statewide, 2009**

Trust <sup>1</sup>	Beneficiaries	Total Acres <sup>2</sup>	Timber Sales <sup>2</sup> (\$ millions)
Capitol Building Trust	State Capitol Campus	110,000	8
Charitable, Educational, Penal, and Reformatory Institutions Trust	WA State Institutions	69,000	4
Common School Trust	Public Schools (K-12)	1,800,000	34
Agricultural School Trust and Scientific School Trust	WA State University	84,000	4
State Forest Lands	County	625,000	65
<b>Total</b>		<b>2,688,000</b>	<b>115</b>
Notes:			
1. Includes only trusts with land in the project area.			
2. Statewide amounts; data specific to Cowlitz and Clark counties is not available.			
Sources: WDNR 2009a, 2009b			

The project would create a short-term increase in the trusts' revenue from these lands by triggering the harvest of the existing mature timber stock in and next to the new right-of-way and on any lands that would be occupied by a substation or access roads. Harvest of existing timber stock on existing right-of-way would likely not contribute to an increase in revenue for WDNR because this timber may be owned outright by BPA through fee-owned title or owned by BPA as reflected in existing easement agreements.

The value of short-term increases in government revenue for each action alternative has been quantified (see Table A-7). In some cases, additional trees would be cut next to but outside of the right-of-way for safety reasons, which would increase short-term revenue beyond the values reported here. Any increase in revenue would be offset if WDNR decided to reduce harvest on other lands. Additional revenue would come from BPA's payment of compensation for any state trust lands acquired for the project or for the easements themselves on trust lands. The appraisal process would also consider whether the transmission facilities would diminish the utility of a portion of the timberland property if the line effectively severs this area from the remaining property (called "severance damage").

**Table A-7 Value of Timber Cleared on State Trust Lands (in 2011 dollars)<sup>1</sup>**

Alternatives and Options <sup>2</sup>	Capitol Building	Institutions <sup>3</sup>	Common School	Agricultural	Scientific School	State Forest Lands	Total <sup>4</sup>
<b>Value of Existing Timber</b>							
<b>West Alternative</b>	\$0	\$0	\$2,390	\$0	\$0	\$0	\$2,390
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	+\$52,410	N/C	N/C	N/C	+\$52,410
West Option 3	N/C	N/C	+\$36,650	N/C	N/C	N/C	+\$36,650
<b>Central Alternative</b>	<b>\$167,100</b>	<b>\$157,600</b>	<b>\$753,400</b>	<b>\$3,640</b>	<b>\$110,600</b>	<b>\$1,083,600</b>	<b>\$2,276,000</b>
Central Option 1	N/C	N/C	+\$12,490	N/C	+\$74,850	+\$168,300	+\$255,600
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-\$76,590	N/C	N/C	-\$355,363	-\$431,950
<b>East Alternative</b>	<b>\$48,540</b>	<b>\$0</b>	<b>\$493,600</b>	<b>\$0</b>	<b>\$25,920</b>	<b>\$697,300</b>	<b>\$1,265,400</b>
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	+\$53,590	N/C	-\$11,750	N/C	-\$25,920	+\$244,100	+\$260,000
East Option 3	N/C	N/C	+\$66,260	N/C	N/C	+\$104,600	+\$170,900
<b>Crossover Alternative</b>	<b>\$48,540</b>	<b>\$0</b>	<b>\$650,400</b>	<b>\$0</b>	<b>\$79,220</b>	<b>\$839,500</b>	<b>\$1,618,000</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<b>Net Present Value of Revenue from Forgone Future Timber Harvests<sup>5</sup></b>							
<b>West Alternative</b>	\$0	\$0	\$1,860	\$0	\$0	\$0	\$1,860
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	+\$40,950	N/C	N/C	N/C	+\$40,950
West Option 3	N/C	N/C	+\$28,630	N/C	N/C	N/C	+\$28,630
<b>Central Alternative</b>	<b>\$130,500</b>	<b>\$123,100</b>	<b>\$588,600</b>	<b>\$2,850</b>	<b>\$86,390</b>	<b>\$846,600</b>	<b>\$1,778,000</b>
Central Option 1	N/C	N/C	+\$9,760	N/C	+\$58,470	+\$131,500	+\$199,700
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-\$59,830	N/C	N/C	-\$277,620	-\$337,450

Alternatives and Options <sup>2</sup>	Capitol Building	Institutions <sup>3</sup>	Common School	Agricultural	Scientific School	State Forest Lands	Total <sup>4</sup>
<b>East Alternative</b>	\$37,920	\$0	\$385,600	\$0	\$20,250	\$505,700	\$949,500
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	+\$41,870	N/C	-\$9,180	N/C	-\$20,250	+\$190,700	+\$203,100
East Option 3	N/C	N/C	+\$51,770	N/C	N/C	+\$81,730	+\$133,500
<b>Crossover Alternative</b>	\$37,920	\$0	\$508,100	\$0	\$61,890	\$655,900	\$1,264,000
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Notes:							
N/C – No change from the action alternative.							
1. Calculated for timber that would be cleared from the right-of-way, substations, and access roads.							
2. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.							
3. Includes charitable, educational, penal, and reformatory institutions.							
4. Totals may not sum due to rounding.							
5. Calculated in perpetuity.							
Sources: Herrera 2010, USFS 2010, Warren 2009, WDNR, 2010c							

Trees harvested on State Forest Lands Trust land would increase near-term revenue for the state.

The project would create long-term decreases in government revenue generated from state trust lands in three ways:

- Elimination or reduction of timber production on private timberlands that would be cleared in or next to the new right-of-way or for the substations and access roads
- Increase in the costs of managing private timberland near the new right-of-way, resulting, for example, from project-related restrictions on timber-harvest techniques, such as cable logging, or increases in risks to safety from logging near the right-of-way
- Reduction in the ability of private landowners to generate additional types of revenue, such as from growing trees to sequester carbon on the cleared lands

The long-term decreases in government revenue for each action alternative described in the first bullet are quantified in Table A-7. Measuring the impact entails converting the future impacts on timber-harvest revenue to an equivalent, single number, called the net present value, using a discount rate of 4 percent per year (Row, Kaiser, and Sessions 1981). The decrease in revenue is reported for the acres of trees within new right-of-way acquired for this project. For existing right-of-way, BPA likely has already negotiated compensation for forgone future revenue from timber production. Data are unavailable to quantify the decrease in government revenue resulting from the impacts described in the second and third bullet points above.

## A.2.4 Transportation

Chapter 12 of the EIS provides an analysis of potential project impacts on transportation resources, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land. About 0.2 to 12 miles of new roads would be constructed and about 0.1 to 26 miles of road improvement would occur on WDNR lands for the alternatives (see Table A-8). Other existing roads on WDNR lands would be used to access the transmission line and substations during construction (see existing roads, Table A-8). Options would not change, increase or decrease the miles of roads required for each alternative.

**Table A-8 New, Improved, and Existing Access Roads on WDNR Land in the Project Area**

Alternatives and Options <sup>1</sup>	New Access Roads (miles)	Improved Access Roads (miles)	Existing Roads Potentially Used during Construction (miles)
<b>West Alternative</b>	<b>0.2</b>	<b>0.1</b>	<b>1</b>
West Option 1	N/C	N/C	-0.1
West Option 2	+0.3	+0.2	N/C
West Option 3	+0.8	+0.2	+1
<b>Central Alternative</b>	<b>12</b>	<b>26</b>	<b>20</b>
Central Option 1	+1	+7	+0.2
Central Option 2	N/C	N/C	-0.2
Central Option 3	-1	-2	-1
<b>East Alternative</b>	<b>7</b>	<b>21</b>	<b>30</b>
East Option 1	N/C	N/C	-0.2
East Option 2	+0.4	-1	-10
East Option 3	+0.2	+1	+4
<b>Crossover Alternative</b>	<b>9</b>	<b>16</b>	<b>29</b>
Crossover Option 1	N/C	N/C	+0.1
Crossover Option 2	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C
Notes: N/C – No change from the action alternative. 1. The value for each option represents the net change from the action alternative. It was calculated as the miles added by the option minus the miles in the segments the option replaces.			

A discussion of BPA's access road system is included in Section 3.9, Access Roads, of the EIS. This discussion includes a general description of the width, location, type of road improvement, and construction equipment that would be used. Use of temporary roads within agricultural fields is also discussed. For the WDNR parcels, BPA would acquire rights (easements for line access roads and fee title for substation access roads), and develop and maintain permanent access suitable for travel by wheeled vehicles to each transmission line structure site, substation

or other transmission facility. Existing public and private roads and transmission line rights-of-way would be used for access where reasonably possible.

Potential impacts to vehicle traffic flow would be short-term and moderate during the 30-month construction period if heavy equipment and supplies are transported on local roads to tower sites. Material transport amounts and specific routes are not defined to date, although existing roads that may be used during construction and do not need any improvement have been identified. A typical crew can construct 10 miles of line in about 3 months so construction traffic is likely to be present for 1-3 months before the next 10-mile section is constructed and other roads are used.

Maintenance traffic would not impact transportation modes along any of the action alternatives over the life of the line because it would normally require only a few maintenance vehicles several times a year and helicopters twice a year. Large vehicles such as flatbed trucks or a crane may occasionally be required to replace or repair the transmission line and towers, which could cause minor disruption to local traffic for brief periods of time. As part of BPA's Transmission Engineering Manual, BPA has an Access Road Planning and Design Manual (BPA 1987). This comprehensive manual includes BPA's access road policy and standards regarding the design and construction of access roads, including those on and next to WDNR land.

Environmental, engineering, economic, and maintenance factors are considered in locating and designing access roads. Access road planning, as described in the BPA Manual, takes into account many factors including seasonal constraints for construction, steep slopes, present and potential land uses, soil conditions, soil erosion potential, water quality impacts, visual impacts, and impacts to cultural resources. The BPA Manual also describes erosion and sediment control methods that are implemented. Erosion control is a very important factor in planning, designing, constructing and maintaining access roads. Erosion must be controlled during and after construction to prevent road damage, to avoid undue increases in stream turbidity and sedimentation, and soil deposition outside of the road right-of-way. Well designed and constructed erosion control measures would reduce road maintenance costs and provide a reliable road in the event of emergency work on the transmission line. Drainage structures including culverts, intercepting ditches, water bars, and gravel surfacing are elements of erosion control, as is seeding.

Access road planning and design are important elements of transmission project development and, to be effective, must begin at the earliest stage of project planning. Well-developed access road plans and designs minimize construction and maintenance costs, environmental impacts, and costly delays because of late changes in access road routing. Access road plans and designs are developed using landowner, environmental, construction, and maintenance input. For WDNR land, access road plans and designs would also be coordinated with the appropriate WDNR engineer.

As discussed in the introduction to this appendix, BPA and WDNR expect to negotiate a Statewide MOA with the goal of addressing BPA transmission line operations and maintenance compatibility with WDNR trust land management. Among other things, this MOA is expected to provide mutually agreeable definitions, classifications, and responsibilities for BPA sole and joint use access roads located on WDNR lands, to provide for mutually agreeable maintenance and operation of these roads. Although a statewide approach to BPA access roads on WDNR lands

will be addressed in the Statewide MOA, discussion has occurred between BPA and WDNR on this issue. While these discussions have not concluded, they provide an indication of the likely language concerning definitions, classifications, and best practices for BPA access roads located on WDNR lands that BPA and WDNR expect may be included in the easement documents for the project, and in any project-specific maintenance and operation agreement negotiated if the project is approved. Based on current, in-progress discussions between BPA and WDNR, any such language likely will be similar to, or possibly largely the same as, the following:

#### **A.2.4.1 Definitions**

1. **Road Maintenance:** Periodic work performed on a road so that the road prism remains usable and costly repairs are not needed. Activities include but are not limited to shaping the roadway, vegetation control, cleaning catch basins, installation of cross-drain culverts and culvert maintenance, water bars, ditches, roadside brushing, and spot rocking. Road maintenance may be required because of traffic use or non-traffic related conditions such as vegetation growth.
2. **Road Improvement:** Includes any work that increases the overall value of the road and requires a significant expenditure of resources and specifically excludes road maintenance and road abandonment. Activities include but are not limited to: new road and bridge construction, bridge and culvert replacement, significant road surface improvement or changing the surface of a road, widening, ditch construction, abandonment, decommissioning and road realignments or rerouting. It does not include any of the specific activities listed in road maintenance.
3. **Road Abandonment:** Includes all work to put a road in a condition that no longer requires maintenance. The following work is required to exempt a road from maintenance:
  - a. Roads are out-sloped, water barred, or otherwise left in a condition suitable to control erosion and sediment transport and maintain water movement within a wetland or a natural drainage
  - b. All disturbed slopes, including ditches, are left in a suitable condition to control or limit erosion
  - c. The road is blocked, or other reasonable measures are taken, when equally effective, to prevent four wheel highway vehicles from passing the point of closure at the time of abandonment
  - d. Water crossing structures and fills on all typed waters are removed, except where State determines other measures would provide adequate protection to public resources
4. **Sole Use Road:** A road on state-managed uplands within and outside the transmission corridor that is used almost exclusively by BPA, including roads built for the original line construction, patrol, maintenance, upgrades, emergency repairs, and vegetation management. General characteristics of this type of road include:
  - a. Road does not currently, nor in the foreseeable future, provide needed access to state-managed lands for the purpose of resource management.
  - b. Road is not generally used, identified, or necessary for administrative use by State purchasers, lessees, or permittees.

- c. No additional easement holder user of the road has been identified.
  - d. State rarely uses the road administratively. Such State use includes, but is not limited to easement administration.
  - e. State does not have a designated recreational trail or promote other authorized recreational use of the road.
  - f. State does not consider the road part of the State funded transportation system.
5. Joint Use Road: A joint use road is a road on WDNR-managed land that is used by both BPA and WDNR. General characteristics of this type of road include:
- a. State uses or has immediate plans to use the road, or a portion of the road, to access WDNR-managed lands.
  - b. State's purchasers, lessees or permittees require use of the road.
  - c. An additional easement holder user of the road may have been identified.
  - d. State has designated sections of the road as a recreation trail or has invited recreational use onto the road.
  - e. State maintains the road and considers the road part of the State funded transportation system.

#### **A.2.4.2 Best Practices To Maintain and Improve Joint and Sole Use Roads on State-Managed Lands**

WDNR and BPA agree to produce and maintain a safe, cost effective, environmentally friendly, and practical road program that is supported by and meets the needs of the sole and joint use roads. Instead of complying with specific roads standards, the agencies will identify and implement best practices to accomplish the following objectives:

- Protect water quality and avoid sediment loading into water bodies
- Protect sensitive areas and reduce ecosystem impacts
- Maintain natural channels, natural stream flow, and maintain passage for aquatic organisms
- Control surface water on the road
- Stabilize the driving surface
- Evaluate unauthorized use that may damage the road and take steps to curtail such use
- Implement needed slope stabilization measures and reduce mass wasting
- Establish compatible vegetation on disturbed areas
- Avoid and control the spread of noxious weeds

## A.2.5 Cultural Resources

Chapter 13 and Appendix I of the EIS provides an analysis of potential project impacts on cultural resources, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land. Sites have been identified by using a variety of methods including archaeology, oral history and history. Many of the pre-contact sites recorded in the project area are near major waterways including Lacamas Lake, the Washougal River, and the Columbia River. None of these major waterways are crossed by the project on WDNR land. Fewer archaeological sites have been identified in upland areas in the eastern and northern portions of the project area, where WDNR lands are most dense. Six historic sites are potentially eligible for listing and have been identified on WDNR parcels. Two of these sites are crossed by the project. One site, a historic road, is located between two tower sites and would be spanned by the new line. The other site, a historic road and bridge, is just within the proposed right-of-way.

During construction, BPA attempts to avoid known sites whenever possible and uses trained cultural resource monitors on large-scale projects to ensure unidentified sites are not inadvertently impacted. Known archaeological sites would be delineated both by surface observations and subsurface testing before construction to avoid physically impacting sites during construction. For unknown sites, appropriate mitigation procedures would be in place to stop construction activities and determine protective measures (e.g., avoidance) if artifacts are found (see Chapter 13). Impacts should not occur to unknown sites with these procedures in place.

If towers, substations, and access roads are sited to avoid sensitive areas, their subsequent maintenance and operation would not affect known resources. If any maintenance activities would need to occur outside of tower locations, outside of the substation fence, or off access roads, a review of sensitive areas would be required to avoid impacting resources. An on-the-ground survey and inventory of cultural resources would occur once a Preferred Alternative has been identified.

## A.2.6 Geology and Soils

Chapter 14 and Appendix J of the EIS provides an analysis of potential project impacts on geology and soils, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land. The analysis in Chapter 14 includes a general assessment of geologic hazards including WDNR parcels potentially affected by the project, and the identified measures to lessen or avoid potential geologic hazards would also apply to WDNR land. Maps in Appendix I display the liquefaction risks and faults found within the project area, including WDNR parcels.

WDNR lands in the project area are located in the hilly topography of the South Cascades and Willapa Hills physiographic provinces where residual soil overlays igneous bedrock. Potential impacts to soils that may result on WDNR lands from the project include increased soil erosion, soil compaction, and increased landslide activity.

**Soil Erosion.** Almost all (about 99 percent) of the WDNR lands in the project area have a severe or very severe hazard of erosion. Increased soil erosion could lead to increased sedimentation



into water bodies, which in turn would impact water resources (such as drinking water), fish (such as salmon and steelhead), and plants, as well as degradation of air quality from blowing dust. Although the soils on WDNR land may be susceptible to erosion, with implementation of mitigation measures as described in Chapters 3 and 14, the impact from erosion would be low.

**Soil Compaction:** Similar to other areas of the project, WDNR lands in the project area would be subjected to permanent soil compaction where roads, towers, and substations are constructed, and temporary soil compaction would occur in areas disturbed during project construction, such as near roads, towers, and substations. Impacts from compacted soils could include restricted infiltration and root depth, and reduced water available for plant growth. When infiltration is reduced, runoff may occur and lead to erosion, nutrient loss, and potential water quality problems. These impacts would be reduced, but not eliminated, through the implementation of the mitigation measures described in Chapters 3 and 14.

**Landslide Areas:** Two mapped landslides occur on WDNR land in the project area; one north of the Lewis River, the other south of Yacolt. Potential impacts resulting from landslides triggered or exacerbated by the project on WDNR land include damage to roads, disruption of utilities (such as transmission lines or pipelines), damage to plant and wildlife habitats, and sedimentation or damming of water bodies. These potential impacts would be avoided or reduced through implementation of mitigation measures described in Chapters 3 and 14, such as siting towers and roads to avoid potentially unstable locations, or designing towers and roads specifically to avoid destabilizing landslide areas. Additionally, BPA monitors towers for signs of distress due to slope movement. Potential active slide-caused problems would likely be observed at towers during the annual maintenance crew tower inspections and twice-a-year helicopter inspections.

Because road development also has the potential to cause erosion or landslides, road grades on all lands crossed by the proposed project would be varied depending on the erosion potential of the soil and roads would be rocked where needed for dust abatement, stability, load bearing, and seasons of use. Final design measures would take slopes, soil types, bedrock, the presence of bedrock hollows or inner gorges, and other factors into account based on site-specific information.

**Seismic Risks and Volcanic Activity:** The risk to the project on WDNR land from earthquakes and volcanic eruptions is low. While all of the project including those portions potentially on WDNR lands could be subjected to shaking from an earthquake, all facilities would be built to applicable seismic standards and combined wind- and ice-loading tower design criteria typically exceed earthquake-induced loads.

Seismically induced liquefaction risk is also low; WDNR lands in the project area are mostly underlain by igneous bedrock with a small area underlain by glacial deposits. Generally, transmission towers are likely to survive settlement associated with liquefaction with only minor structural damage. It is BPA's policy to avoid placing towers in areas where liquefaction might occur, such as stream crossings. If a potential liquefaction hazard is found, the liquefiable soils would most likely be excavated to bedrock and replaced with non-liquefiable backfill. In addition, no mapped active faults cross the project on WDNR lands.

Portions of the project potentially on WDNR lands could be subjected to ashfall from an eruption of a nearby volcano, but none of the WDNR land in the project area are mapped as

being located within a proximal (e.g., lava flows, pyroclastic flows) or distal (i.e., lahar) hazard zone.

Additional geology and soils information would be obtained from updated geologic hazard assessments, including on-the-ground field assessments of the Preferred Alternative. BPA would likely not use certain models suggested by WDNR as part of its geologic hazard assessments because field assessments would essentially cover the outcomes the models would produce. An update of the geologic hazard assessments in Appendix J would include another review of liquefaction hazard mapping, geologic maps for fault locations, and aerial photographs combined with surface condition assessments at proposed tower locations and surrounding terrain for landslide hazard assessment. Geological soil testing would continue to be done at representative tower locations to help determine appropriate tower footings for a given soil type or hazard. Geologic and soil hazard areas are avoided where possible, and where avoidance is not possible, towers and roads would be designed to address the applicable hazard.

## A.2.7 Water and Fish

Chapters 15 and 19 and Appendix K of the EIS provide an analysis of potential project impacts on water and fish resources, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land.

Rights-of-way and new and improved access roads would not cross any FEMA designated 100-year floodplains on WDNR land. None of the new towers on WDNR land or Casey Road Substation are in floodplains. No stream segments listed on the Washington State 303(d) list would be crossed by rights-of-way and new and improved access roads on WDNR land. Access roads would cross some streams on WDNR land (see Table A-9). Clearing of riparian vegetation would occur along these streams.

**Table A-9 Access Roads and Right-of-Way Stream Crossings on WDNR Land in the Project Area**

<b>Alternatives and Options<sup>1</sup></b>	<b>New and Improved Roads that Cross Any Stream<sup>2</sup> (number)</b>	<b>Right-of-Way Stream Crossings (number)</b>
<b>West Alternative</b>	<b>0</b>	<b>2</b>
West Option 1	N/C	N/C
West Option 2	N/C	N/C
West Option 3	+3	+2
<b>Central Alternative</b>	<b>69</b>	<b>81</b>
Central Option 1	+22	+4
Central Option 2	N/C	N/C
Central Option 3	-4	-19
<b>East Alternative</b>	<b>42</b>	<b>33</b>
East Option 1	N/C	N/C
East Option 2	+13	+14
East Option 3	+8	+15

<b>Alternatives and Options<sup>1</sup></b>	<b>New and Improved Roads that Cross Any Stream<sup>2</sup> (number)</b>	<b>Right-of-Way Stream Crossings (number)</b>
<b>Crossover Alternative</b>	<b>31</b>	<b>55</b>
Crossover Option 1	N/C	N/C
Crossover Option 2	N/C	N/C
Crossover Option 3	N/C	N/C
Notes: N/C – No change from the action alternative. 1. The net change for each option represents the net change from the action alternative. It was calculated as the total number added by the option minus the total number removed by the option. 2. Includes ephemeral, intermittent and perennial streams. Source: WDNR 2006		

WDNR manages 2.4 million acres of state-owned aquatic lands beneath many project area water bodies including the Columbia, Cowlitz, Coweeman, Lewis, and Kalama rivers. Easements or permits on these state-owned aquatic lands may be required where alternatives or options cross (see Table A-10)

Special status and resident fish species that may be present in project area streams on WDNR land include resident cutthroat trout, rainbow trout, Lower Columbia River steelhead (listed as threatened under the Endangered Species Act [ESA]), and Lower Columbia River coho (ESA threatened).

**Table A-10 WDNR State-Owned Aquatic Lands Potentially Crossed by Alternatives or Options in the Project Area**

<b>State-Owned Aquatic Lands</b>	<b>Segment</b>	<b>Alternative or Option</b>
<b>Columbia River</b>	52	East, Central, West, Crossover
<b>Cowlitz River</b>	F, 3, 4	East, Central, West, Crossover, East Option 1, Central Option 2
<b>Coweeman River</b>	9	West, Crossover
<b>Lewis River</b>	25, M, L, K	West, Central, Crossover, East, Central Option 3
<b>Kalama River</b>	9, 10	West, Central, Crossover
<b>Washougal</b>	52	East, Central, West, Crossover

## **A.2.8 Wetlands**

Chapter 16 and Appendix L of the EIS provides an analysis of potential project impacts on wetlands, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land.

Although no substations, access roads, or towers would be built in wetland areas on WDNR land, impacts from right-of-way clearing would occur in forested and scrub-shrub wetlands on WDNR land (see Table A-11). As described in Section 16.2.4, West Alternative, clearing and fill

of emergent and scrub-shrub wetlands along West Option 1 (Segment 40) would occur within the Lacamas Creek floodplain. Some of this area 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, and Figure 17-1). These areas are not included in Table A-11 because WDNR does not currently own the parcels. WDNR does anticipate the purchase and transfer of these parcels to WDNR ownership by the time this DEIS is released.

**Table A-11 Potential Clearing of Wetlands on WDNR Land in the Project Area**

Alternatives and Options <sup>1</sup>	Right-of-Way Clearing (acres) <sup>2,3</sup>	
	Forested	Scrub-Shrub
<b>West Alternative</b>	<b>0.02<sup>3</sup></b>	<b>0.1</b>
West Option 1	N/C	N/C
West Option 2	N/C	N/C
West Option 3	+0.2	N/C
<b>Central Alternative</b>	<b>23.7</b>	<b>0.6</b>
Central Option 1	+0.2	N/C
Central Option 2	N/C	N/C
Central Option 3	-5.4	-0.3
<b>East Alternative</b>	<b>13.6</b>	<b>0.6</b>
East Option 1	N/C	N/C
East Option 2	+4.8	+0.4
East Option 3	+2.7	+1.7
<b>Crossover Alternative</b>	<b>18.3</b>	<b>0.3</b>
Crossover Option 1	N/C	N/C
Crossover Option 2	N/C	N/C
Crossover Option 3	N/C	N/C
Notes: N/C – No 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 added by the option minus the acres in the segments the option replaces. 2. Cleared wetland within the right-of-way. 3. All acreages are based on wetlands mapped from available data. Sources: DEA 2009; Herrera 2011a, 2011b, 2012		

## A.2.9 Vegetation

Chapter 17 of the EIS provides an analysis of potential project impacts on vegetation, including on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land. Vegetation types present on WDNR lands where the project would cross include forest, shrubland, herbaceous, and rural landscaped (see Table A-12). No special-status plants are present on WDNR land crossed by the project, although four special-status plant habitats that are managed or proposed for management by WDNR could be affected.

Table A-12 Vegetation Types on WDNR Land in the Project Area

Alternatives and Options <sup>1,3</sup>	Vegetation Type (acres) <sup>2</sup>						
	Mature Forest	Forest	Production Forest	Shrubland	Herbaceous	Rural Landscaped	Urban/Suburban Landscaped
<b>West Alternative</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	+11	N/C	N/C	N/C	N/C
West Option 3	N/C	+<1	+8	+<1	N/C	N/C	N/C
<b>Central Alternative</b>	<b>0</b>	<b>1</b>	<b>480</b>	<b>5</b>	<b>&lt;1</b>	<b>4</b>	<b>0</b>
Central Option 1	N/C	+1	+59	+29	+<1	+6	N/C
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-90	-1	+1	N/C	N/C
<b>East Alternative</b>	<b>0</b>	<b>2</b>	<b>262</b>	<b>6</b>	<b>&lt;1</b>	<b>2</b>	<b>0</b>
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	N/C	-1.2	+50	-<1	+<1	-<1	N/C
East Option 3	N/C	N/C	+36	+4	N/C	N/C	N/C
<b>Crossover Alternative</b>	<b>0</b>	<b>2</b>	<b>345</b>	<b>4</b>	<b>&lt;1</b>	<b>1</b>	<b>0</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Notes:

N/C – No change from the action alternative.

- The value for each option represents the net change from the action alternative. It was calculated as the acres added by the option minus the acres in the segments the option replaces.
- Total acres mapped within 150-foot transmission line right-of-way, access roads, and substations for each action alternative.
- Clearing for danger trees outside the right-of-way is unknown at this time and not included in these calculations.

Source: Herrera 2010

The West Alternative and Options (segments 36, 36A, 36B, 40, 41, 45, 46, and 50) cross the Lacamas Prairie Natural Area, which has been identified as a potential Natural Area Preserve and Natural Resource Conservation Area by WDNR (see Section 17.1.2.1, WDNR Protected Areas, and Figure 17-1). Approximately 33 acres of the Natural Area would be crossed by new and existing right-of-way; and 11 acres would be affected by towers and access roads, including less than 1 acre of WNHP Oregon white oak woodland priority ecosystems. Special-status species that have documented occurrences in the Natural Area include Bradshaw's lomatium (ESA endangered), Hall's aster (WA sensitive), Oregon coyote-thistle (WA threatened), small-flowered trillium (WA sensitive), dense sedge (WA threatened), and Nuttall's quillwort (WA sensitive).

The West and Crossover alternatives also cross a WDNR forest riparian conservation easement along Segment 9 and a WDNR genetic research plot along Segment 30 of Central Option 3 (see Maps A and C). These areas could be impacted by right-of-way clearing, tower and road construction, and danger tree removal.

Approximately 0.5 acre of existing access road crosses the southern edge of an herbaceous bald on WDNR land along Segment O of the East and Crossover alternatives (see Section 17.1.2.2, WNHP Priority Ecosystems, and Map D). Although species composition is unknown at this time, it could qualify as a Washington Natural Heritage Program (WNHP) North Pacific herbaceous bald and bluff priority ecosystem (it is not currently documented as such by WNHP).

Noxious weeds could also be present on WDNR lands where the project would cross. The project could cause the spread of noxious weeds, especially along newly constructed access roads (see Chapter 17 and Appendix M). To control or contain noxious weeds on WDNR parcels potentially crossed by the proposed project, BPA would undertake actions in coordination with WDNR at four stages of the project: pre-construction, construction, immediate post-construction, and maintenance.

**Pre-Construction:** The MOA between WDNR and BPA and/or easement document for any WDNR lands affected would outline measures for weed control. As part of BPA's noxious weed management, BPA would conduct a noxious weed survey once a Preferred Alternative is chosen and before construction to help determine infestation locations and appropriate mitigation measures needed before and during construction. If noxious weeds are found on WDNR land, BPA and WDNR could decide to apply herbicides prior to construction to help reduce spread during construction. Construction specifications would contain provisions stating how the noxious weeds would be controlled or contained including provisions outlined in the Statewide MOA.

All proposed actions to control or eradicate noxious weeds would comply with the Carson-Foley Act (P.L. 90-583), the Federal Noxious Weed Act (P.L. 93-629), and other applicable state and federal regulations, and all applicable state and county noxious weed control regulations and guidelines to the extent practicable.

**Construction:** During construction, BPA would implement noxious weed control measures specified in the construction specifications which would include establishing vehicle and equipment washing stations in strategic locations to reduce the possibility of seed being carried to areas that do not have infestations, and reseeding disturbed areas with desirable species to limit the spread of noxious weeds. To ensure that the desired level of noxious weed control is

being carried out, the BPA field inspector and the land liaison representative would monitor the program. For WDNR land, BPA would coordinate these efforts with WDNR as specified in the Statewide MOA or easement agreement.

**Immediate Post-Construction:** Upon completion of construction, the maintenance of the transmission line and its access roads and rights-of-way would become the responsibility of BPA Transmission Line Maintenance with the assistance of the BPA Regional Natural Resource Specialist. Before the line is released for future maintenance, a detailed post-construction field review would be conducted with WDNR, the BPA field inspector, and the BPA Regional Natural Resource Specialist. Specific noxious weed control measures would be agreed upon and responsibilities, including funding, assigned to the participating organization.

**Maintenance:** Over the long-term, vegetation (including noxious weeds) on WDNR land would be managed by the BPA Regional Natural Resource Specialist along the right-of-way as guided by BPA's Transmission System Vegetation Management Program EIS, agreements made with WDNR, and input from the county weed boards.

Noxious weed control on BPA easements across WDNR land and other lands would be coordinated through the BPA Regional Natural Resource Specialist. Prior to conducting any such weed control, BPA's usual practice is to develop a noxious weed management plan within an overall Vegetation Management Prescription, followed by preparation of a Supplement Analysis (SA) to BPA's Transmission System Vegetation Management Program EIS. The SA provides a review of the control activities and ensures they are consistent with the vegetation maintenance activities contained in that EIS. BPA would coordinate preparation of the noxious weed management plan on WDNR managed trust lands with WDNR staff. Examples of maintenance policies that are defined in BPA's Transmission System Vegetation Management Program EIS, and that likely would be included in a noxious weed management plan and considered in SAs relevant to WDNR, include the following:

- Apply herbicides to the rights-of-way
- Provide herbicides to landowners
- Contract with the owners or county weed control districts to apply herbicides to BPA rights-of-way
- Contract with the county weed control district to apply herbicides to specific identified noxious weeds
- Initiate additional control measures as recommended by local jurisdictions or responsible governmental agencies
- Where required by state or local agencies or in agricultural areas where noxious weeds are present, pressure or steam wash all vehicles used in that location before entering another location

## A.2.10 Wildlife

Chapter 18 of the EIS provides an analysis of potential project impacts on wildlife, including impacts on WDNR land, and identifies measures to lessen or avoid impacts that would also apply to WDNR land. Special-status species that may be present on WDNR land crossed by project

include marbled murrelet (ESA threatened) and northern spotted owl (ESA threatened). Central Option 1 and the access road to Casey Road Substation may cross near marbled murrelet habitat on WDNR land. The Central, Crossover, and East alternatives may cross WDNR land that is within a 1.8-mile radius of known spotted owl activity and management areas. Additionally, WDNR has a Habitat Conservation Plan (HCP) that covers all the upland and riparian trust land on the westside and the east slope of the Cascades within the range of the spotted owl. This HCP provides multiple species’ protection on all forested WDNR lands including those that may be impacted by the alternatives or options that cross WDNR land.

The West Alternative and Options cross westside prairie and Oregon white oak woodland habitats in the Lacamas Prairie Natural Area, which are both considered WDFW priority habitats (see Section 18.1.2.3, Westside Prairie). About 0.5 acre of existing access road crosses the southern edge of an herbaceous bald habitat along Segment O of the East and Crossover alternatives (see Section A.2.9). Located on WNDR land, this herbaceous bald has been documented by WDFW as priority habitat (see Section 18.1.2.2, Herbaceous Balds).

Other species that may have special status on WDNR land in the project area include elk and deer. Habitat may include winter range for different herds of Columbian black-tailed deer, Roosevelt elk, and Rocky Mountain elk in the Yale Valley and Rock Creek areas (East, Crossover, and Central alternatives). The Casey Road site is also within the winter range for the Willapa Herd of Roosevelt elk.

### A.3 Measures for WDNR Lands

In addition to mitigation measures identified in Chapters 3 and 5 through 22 of the EIS, the measures outlined in Table A-13 would be implemented to further reduce or avoid potential impacts on WDNR lands.

**Table A-13 Measures for WDNR Lands**

Measure	Implementation
Implement the MOA with WDNR that reduces noxious, invasive and undesirable species including tall-growing woody plants and works towards compatible and native low-growing species vegetation on WDNR lands. The MOA outlines coordination between WDNR and BPA for the use of herbicides on lands where WDNR uses herbicides and minimizes the use of herbicides on lands where WDNR does not use herbicides.	Washington Statewide Rights-of-Way MOA/WDNR Easement Document
Implement the MOA that defines, classifies, and designates responsibilities for BPA sole and joint use access roads for the proposed project that would be located on WDNR lands, with the goal of addressing operations and maintenance compatibility of the proposed transmission line with WDNR trust land management.	Washington Statewide Rights-of-Way MOA/WDNR Easement Document
For any noxious weed management plans prepared for proposed weed control and other vegetation maintenance on WDNR managed trust lands as part of future line maintenance activities, coordinate preparation of these management plans with WDNR staff.	Noxious Weed Management Plans



Measure	Implementation
Commit to coordinating with WDNR regarding the 1989 WDNR Agricultural and Grazing lands Policy Plan and related Resource Management Plans for individual parcels during construction and maintenance of the line and access roads over WDNR trust lands. Provide WDNR with notice of potential impacts to affected lands enrolled in the Conservation Reserve Program. Request permission to disturb ground cover as needed to complete the project and agree to restore impacted lands outside of lands developed for tower pads and access roads to the same type of cover at no expense to any applicable WDNR lessee or to WDNR as landowner.	Washington Statewide Rights-of-Way MOA
Implement the Appraisal MOU with WDNR to pay fair market value for impacts any easement conveyances granted to BPA to on trust lands.	Appraisal MOU
Utilize the Appraisal MOU with WDNR to assess the value for any reduction in CRP acreage due to construction of access roads or towers.	Appraisal MOU
Work with WDNR concerning a possible cooperative agreement for the control of unauthorized public access and use on state lands that could result from the proposed project. The agreement could address various provisions related to unauthorized access, such as additional measures to be taken to discourage unauthorized use of the project corridor and associated access roads, periodic inspection for unauthorized access and any resulting damage, and repair of any damage from unauthorized access. BPA will strive to design the corridor to prevent trespass and provide signs that discourage unauthorized use of the corridor.	Washington Statewide Rights-of-Way MOA/WDNR Easement Document
Mark the easement corridor in strategic locations on WDNR land so that BPA, contractors, adjacent landowners and the public can clearly recognize when they are within the corridor to prevent uncompensated corridor expansion, vegetation management conflicts, and to reduce trespass.	Washington Statewide Rights-of-Way MOA/WDNR Easement Document
Develop a mutually agreeable fire prevention and suppression plan with WDNR that addresses managing and controlling the risks associated with wildland fire due to construction, operation, and maintenance of the transmission line.	Washington Statewide Rights-of-Way MOA/WDNR Easement Document

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