3.10 Recreation Resources

This section describes recreation activities within one mile of the line segments. The activities described occur both under and near the existing and proposed transmission lines. In many cases, these activities have not been formalized, permitted, or sanctioned by the landowner or easement holder. Recreational activities within the study area are dispersed and include hunting, off-road vehicle use, fishing, hiking, rock hounding, horseback riding, primitive camping, snowshoeing, and snowmobiling. Recreationists are predominantly full-time residents (Neil White, 2001).

For Your Information

Dispersed Recreation *refers to recreation activities that are not limited to a finite location. These types of activities do not require improvements that commit resources to a particular type of recreation.*

Dedicated Recreation *refers to activities that are limited to a finite geographic location and are supported by improvements that commit the resource to a specific recreational activity.*

Table 3.10-1, *Recreation Resources*, lists recreation sites and categorizes activities as either ***dispersed*** or ***dedicated*** recreation. Map 7, *Land Ownership*, illustrates the proximity of recreation sites to the segments.

3.10.1 Yakima Training Center

Recreation activities on the YTC depend on the season and geographic location. To the north of the site is a 17-mile segment of the John Wayne Trail; an abandoned railroad ROW that has been converted to a multi-use trail extending 110 miles from North Bend, Washington to the Columbia River. Hiking, mountain biking, and horseback riding is permitted along the trail within the YTC.

Other dispersed recreation allowed on the YTC includes hunting, falconry, horseback riding, and mountain biking as well as organized activities such as field dog training and trials, horse endurance rides, and wildlife viewing. Hunting continues throughout the year and is the most popular recreation activity. Falconry also continues throughout the year and is a permitted use throughout most of the YTC. Horseback riding is limited to existing roads and trails, and may be restricted seasonally according to wildlife needs. Mountain biking is allowed on designated roads and in the John Wayne Trail corridor. Field dog training and trials are permitted September through January. Horse endurance rides typically occur during the late spring and early fall. Wildlife viewing of the Western Sage grouse occurs only once a year.

3.10.2 Columbia River near Vantage

Dispersed recreation activities near the Columbia River include sightseeing, wildlife viewing, off-road vehicle use, fishing, hiking, boating, and water sports. Interpretive facilities are provided at the Wanapum Dam, as part of the Native American Heritage Center and the Dam Powerhouse, and are considered dedicated recreation activities.

Table 3.10-1
Recreation Resources

Line Segment	Resource	Dispersed Recreation Activities	Dedicated Recreation Activities
A	Open Range	Hunting, off-road vehicles, fishing, hiking, rock hounding, horseback riding, primitive camping, snowshoeing, snowmobiling	
A	Charlton Canyon Schnebly Canyon and Creek Cooke Canyon Creek Burnt Canyon Cave Canyon Trail Gulch Parke Creek Trail Creek	Hunting, off-road vehicles, fishing, hiking, rock hounding, horseback riding, primitive camping, snowshoeing, snowmobiling	
B, C	YTC ***All activities on the site area subject to geographic and seasonal restrictions.***	Hunting, falconry, horseback riding, wildlife viewing, field dog training, mountain biking	John Wayne Trail (hiking, horseback riding, mountain biking)
B, D, E, F	Columbia River	Sightseeing, wildlife viewing, off-road vehicle, fishing, hiking, boating, water sports	
D	Wanapum Dam		Heritage Center tours and activities, Power house tours
D, E, F	Crab Creek Wildlife Area	Hunting, fishing, wildlife viewing	
D, E, F	Milwaukee Road Corridor	Hiking, mountain biking, horseback riding, primitive camping	
D, E, F	Saddle Mountains (includes BLM managed areas)	Hunting, off-road vehicles, rock hounding, hand gliding, paragliding, horseback riding, hiking, camping, falconry, mountain biking, bird watching	
D, E, F	Hanford Reach of the Columbia River	Boating, fishing	***No landing on Hanford Site allowed***
D, E, F	Hanford Reach National Monument	Wildlife observation, photography, fishing hunting, environmental education, sightseeing	

Source: Neil White, per comm.
Billie Sumrall, per comm.
Wanapum Dam Heritage Center website
James Munrone, per comm.
BLM, 1997
CH2M HILL, 1998
U.S. Department of the Army, 1996

On the east side of the Columbia River near Vantage, the John Wayne Trail is called the Milwaukee Road Corridor. The trail follows the Chicago Milwaukee St. Paul and Pacific railroad line for the majority of its length. At a few locations, the trail departs from the abandoned railroad corridor because of private ownership. Recreational use of the trail requires a permit from the DNR. Along the trail, recreation is dispersed and includes hiking, mountain biking, horseback riding, and primitive camping. Within the Crab Creek Wildlife Area, dispersed recreation focuses on the pristine natural environment and includes fishing, hunting, and wildlife viewing.

3.10.3 Saddle Mountains

The portion of the Saddle Mountains Management Area that is managed by the BLM is remote and far from major transportation corridors, so sightseeing is limited. However, other dispersed recreation activities occur in the area. Hang gliders come to this area from all over the state for the updrafts along the north slope of the range. This area has an even greater geographical pull for rock hounding, with visitors from as far north as British Columbia, the Oregon Coast and other areas within the U.S. Because there are over 80 miles of roads and trails on public lands (most were constructed to access power transmission lines), mountain biking opportunities are also available. Overall, recreational opportunities within this area draw a wide range of both local and regional recreation user groups (BLM 1997).

3.10.4 Hanford Reach National Monument

The Hanford Reach boasts some of the best salmon fishing in the entire Columbia River watershed. Anglers travel great distances to fish these waters during the peak of the fishing season. The Hanford Reach also offers dispersed water-related recreation including boating and fishing. However, no landing on the Hanford Site is allowed.

The Saddle Mountains Unit is on the north side of the Hanford Reach National Monument and within this area, recreational activities are prohibited.

Recreation in the Hanford Reach National Monument is dispersed and includes sightseeing from major transportation corridors, hunting hiking, wildlife observation, photography, fishing, and environmental education. This area lacks interpretive and service facilities typical of a national monument.

3.11 Cultural Resources

For Your Information

Cultural resources *are those historic and archaeological properties, properties of traditional and cultural significance, sacred sites, Native American human remains and associated objects, and cultural landscapes which are entitled to special consideration under federal statute, regulations, and/or executive orders.*

Lithic *relates to stone tools.*

Cultural resources located in the proposed study area include prehistoric camps, ***lithic*** scatters, prehistoric stone tool quarries, historic homesteads, historic railroad sites, and traditional root-gathering areas. There are no sacred sites recorded at this time in the study area.

The Columbia, Kittitas, Wanapam, Wenatchee, and Yakama peoples lived in the vicinity of the study area at the time of the Lewis and Clark expedition of the Snake and Columbia rivers in 1805 en route to the Pacific (Ray 1936). These people were Sahaptan and Salish speakers, part of what would later be described as the Plateau culture. Their life was focused on an annual round anchored by specific times for gathering, hunting, fishing, and trading, but also for religious activities, visiting, courting, storytelling, dancing, and other such activities. Additional ethnographic descriptions of Plateau groups are available in Mooney (1896), Ray (1936, 1939), Relander (1956) and Spier (1935).

A period of exploration and trapping followed, with early travelers such as Wilson P. Hunt of the Astor Company, David Thompson of the Northwest Company, Alexander Ross, Ross Cox, and many others arriving in this area between 1805 and 1815. The Hudson's Bay Company opened Fort Nez Perces in the 1820's, which was later called Old Fort Walla Walla in the 1830's. Many interesting and informative historical accounts of this period are available, such as Franchere (1969), Glover (1962), Thwaites (1959), and Symons (1882).

Gold mining brought many Europeans, Euroamericans, and Chinese through the study area beginning around 1850, but it was ranching that kept them there. The area's grass provided sustenance for cattle and their owners alike (Splawn 1917). Transportation – particularly river crossings – provided the means for expansion. The Columbia River, the Caribou Trail, wagon roads, and later the railroads, all served to bring travelers and supplies to this area, providing residents with the opportunity to serve as merchants. Camels were even used for several years to bring gold mining supplies from this area to Idaho and Montana (Lewis 1928).

Horse ranching and fruit farming increased in the latter half of the last century, but it was not until more efficient irrigation systems were organized about the turn of the century that fruit farming really became a major activity in this region.

The world's first dual-purpose nuclear reactor (the N-Reactor) was built on the Hanford Site in 1963-1969 (Rice 1983). Some of the

Hanford Site structures are now old enough to be considered historic sites.

A search of recorded sites was conducted in the study area. Cultural resources are categorized as historic and archaeological properties, properties of traditional and cultural significance, sacred sites, and cultural landscapes, which are all recognized and protected under federal mandates.

For Your Information

Debitage *is the flaking by-products that result from working rough stone into tools.*

Archaeological lithic scatters produced during stone tool manufacture or modification are the most common archaeological site type in the project area. Flaked tools and ***debitage*** are the overwhelmingly the most common cultural material present at these sites, although ground, pecked, and battered stone tools also are found. Campsites, which include a number of material types and features and which represent longer-term use and multiple activities, make up the second most common site type. Other common archaeological site types include resource procurement and processing activities, such as quarries, butchering sites and root gathering areas. A cultural resource survey, which will be done before construction, will likely locate additional prehistoric sites of these kinds.

Historic sites recorded in this area include historic homesteads, dumps, trails, railroad-related features and earthen structures. These sites include both historic structures and artifact scatters.

Map 11, *Cultural Areas*, shows the areas of known cultural areas. For further detail see Appendix H, *Phase I Cultural Resource Assessment*.

3.12 Public Health and Safety

Transmission facilities provide electricity for heating, lighting, and other services essential for public health and safety. These same facilities can potentially harm humans. Contact with transmission lines can injure people and damage aircraft. This section describes public health and safety concerns, such as shocks and noise, related to transmission facilities. More detailed information can be found in Appendix I, *Electrical Effects*.

3.12.1 Electric and Magnetic Fields

Transmission lines, like all electrical devices and equipment, produce ***electric and magnetic fields*** (EMF). The voltage, or force that drives the ***current***, is the source of the electric field. Electric fields are expressed in units of volts per meter (V/m) or kilovolts per meter (kV/m). The current, or movement of electrons in a wire, produces the magnetic field. The strength of magnetic field depends on the current, design of the line, and the distance from the line. Field strength decreases rapidly with distance. Electric fields can be reduced significantly by the presence of conducting objects. Thus, inside houses and automobiles, electric fields are lower than outside because of shielding.

For Your Information

Electric and magnetic fields *(EMF) are the two kinds of fields produced around the electric wire or conductor when an electric transmission line or any electric wiring is in operation.*

Current *is the amount of electrical charge flowing through a conductor.*

Electric and magnetic fields are found around any electrical wiring, including household wiring and electrical appliances and equipment. Throughout a home, the electric field strength from wiring and appliances is typically less than 0.01-kV/m. However, fields of 0.1-kV/m and higher can be found very close to some electrical appliances.

Average magnetic field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 ***milligauss (mG)***. Very close to appliances carrying high current, fields of tens of hundreds of milligauss can be present. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. Because of this, transmission lines can be a major source of magnetic field exposure throughout a home located close to the line. Typical electric and magnetic field strengths for some BPA transmission lines are given in Table 3.12-1, *Typical Electric and Magnetic Field Strengths*.

*A **milligauss** is one thousandth of a gauss.*

*A **gauss** is a unit of magnetic induction.*

kV/m = kilovolt per meter
mG = milligauss

Table 3.12-1
Typical Electric and Magnetic Field Strengths

Transmission Lines	Electric Fields (kV/m)	Magnetic Fields (mG)	
		Maximum[1]	Average[2]
115-kV			
Maximum on ROW	1	62	30
Edge of ROW	0.5	14	7
200 feet from center	0.01	1	0.4
230-kV			
Maximum on ROW	2	118	58
Edge of ROW	1.5	40	20
200 feet from center	0.05	4	2
500-kV			
Maximum on ROW	7	183	87
Edge of ROW	3	62	30
200 feet from center	0.3	7	3

[1] Under annual peak load conditions (occurs less than 1 percent of the time)

[2] Under annual average loading conditions

Note: The information above was obtained from a BPA study to characterize nearly 400 transmission lines located in the Pacific Northwest. Based on 1992 data (Sterns. et. al.).

There are currently no national standards in the United States for electric and magnetic fields from transmission lines. Some states have established electric and/or magnetic field standards for 60-Hz electric and magnetic fields. The state of Washington does not have limits for either electric or magnetic fields from transmission lines. The BPA has maximum allowable electric fields of 9-kV/m on the ROW and 5-kV/m at the edge of the ROW. The BPA also has maximum allowable electric field strengths of 5-kV/m, 3.5-kV/m, and 2.5-kV/m for road crossings, shopping center parking lots, and commercial/industrial parking lots, respectively.

Both electric and magnetic fields induce currents in conducting objects, including people and animals. The magnitude of the induced current in objects under lines depends on the electric- or magnetic-field strength and the size and shape of the object. The currents induced in people, even from the largest transmission lines are generally too weak to be felt. However, under certain circumstances, contact to a grounded object by a well-insulated person in a high electric field can result in a perceived nuisance shock or spark discharge. Similarly, contact of a grounded person with an ungrounded large conducting object, such as a truck or tractor, in an electric field can result in a perceived nuisance shock due to the induced currents in the object. Transmission lines are designed and built so that such shocks occur infrequently and if they do, are no higher than the nuisance level and that they occur infrequently. Stationary conducting objects, such as metal buildings and fences,

near transmission lines are grounded to prevent them being a source of shocks.

The possibility of health effects from long-term exposure to 60-Hz electric or magnetic fields has been researched for several decades. The consensus of scientific panels reviewing this research is that the evidence does not support a causal relationship between electric or magnetic fields and any adverse health outcomes, including childhood cancer, adult cancer, reproductive outcome, or other diseases. However, investigation of a statistical association between magnetic field exposure and childhood leukemia continues. It has not yet been possible to exclude a role for magnetic fields above 4 mG given the small number of persons studied with exposures at these levels and the problems of selecting appropriate control groups. Although uncertainty about possible effects of EMF on health has been considerably reduced in the past few years, concerned individuals can take low or no cost actions to reduce long-term exposures.

The research literature published to date has shown little evidence that exposure to EMF leads to adverse effects on domestic animals, wildlife and plants. (See Appendix J, *Assessment of Research Regarding EMF and Health and Environmental Effects*.)

3.12.2 Noise

3.12.2.1 Transmission Line Noise

Audible noise can be produced by transmission line ***corona***. In a small volume near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound that under certain conditions is accompanied by a 120-Hz hum.

Corona-generated audible noise is of concern primarily for contemporary lines operating at voltages of 345-kV and higher during foul weather. The conductors of high-voltage transmission lines are designed to be corona-free under ideal conditions. However, a protrusion on the conductor surface – particularly water droplets on or dripping off the conductors – cause electric fields near the conductor surface to exceed corona onset levels, and corona occurs. Therefore, audible noise from transmission lines is generally a foul-weather (wet-conductor) phenomenon. However, during fair weather, insects and dust on the conductors can also serve as sources of corona.

For Your Information

Corona *is an electrical discharge, at the surface of a conductor. A technical definition is included in Chapter 9, (Glossary and Acronyms).*

3.12.2.2 Substation Noise

The Schultz Substation is surrounded by rangeland, with some agricultural land to the south and one rural residence approximately 0.25 to 0.5 mile to the southeast. The site is relatively quiet, and due to the distance from the nearest residence, does not affect the surrounding area.

The Vantage Substation is located east of the Columbia River and is surrounded by open shrub-steppe habitat land and rangeland. As with the Schultz Substation, this site is relatively quiet.

The Midway Substation is located along the northern base of Umtanum Ridge, a short distance south of the Columbia River. The area to the west, east, and north between the substation and the river is open shrub-steppe habitat land. Like the Schultz and Vantage Substations, this site is also relatively quiet.

The Hanford Substation is located along the southeast side of the Columbia River. Except for facilities associated with the retired N-Reactor adjacent to the substation site to the north/northeast, the area surrounding the site is open shrub-steppe habitat land. The retired N-Reactor is not operating. The only noise produced is from workers who perform surveillance and maintenance at the site.

Sound varies at the substation sites, as a result of weather and other factors such as background noise and the kind of equipment operating, and could be higher or lower on any given day or at any given time at these substations.

The site of the new Wautoma Substation is currently an open field. Noise at this site is primarily background noise from wind and weather, with the sound of an occasional truck or automobile on the dirt road or distant Highway 24.

3.12.3 Radio and TV Interference

➡ For Your Information

Electromagnetic interference (EMI) *is high-frequency electrical noise that can cause radio and television interference.*

Corona on transmission line conductors can generate electromagnetic noise in the frequency bands used for radio and television signals. In rare circumstances, corona-generated ***electromagnetic interference*** (***EMI***) can also affect communication systems and sensitive receivers. Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345-kV or higher. This is especially true of interference with television signals.

Radio reception in the AM broadcast band (535 to 1,604 kilohertz (kHz)) is most often affected by corona-generated EMI. FM radio reception is rarely affected. Generally, only residences very near transmission lines can be affected by radio interference.

Corona-caused television interference occurs during foul weather and is generally of concern only for conventional receivers within about 600 feet of a line. Cable and satellite television receivers are not affected.

Spark gaps on distribution lines and on low-voltage transmission lines are a more common source of radio and television interference than is corona from high-voltage transmission lines. This gap-type interference is primarily a fair-weather phenomenon caused by loose hardware and wires.

3.12.4 Toxic and Hazardous Materials

Minimal amounts of hazardous waste result from routine maintenance procedures performed on substation equipment and transmission lines. The type and volume of waste such as oily rags, minor leaks from vehicles, etc., depend on maintenance procedures.

The areas with the most human activities, specifically the YTC, the Wahluke Slope, and the Hanford Site are most likely to have hazardous materials issues.

The military conducts live-fire training and maneuvers at the YTC. Hazardous materials that might be encountered along the proposed routes through the YTC include live and spent ammunition, unexploded ordinance, petroleum products, and other military chemicals or explosives.

The Wahluke Slope, excluding the Hanford Reach National Monument, supports an intensive agricultural area. Hazardous materials that may be encountered in this area are related to agricultural operations, and include pesticides, fertilizers, and petroleum products. Pesticides and fertilizers may be encountered in their bulk form in storage or illegal disposal sites, in the form of spills, or after they have been applied to crops.

The Hanford Site includes retired radioactive material production facilities and active research and radioactive waste management facilities. These areas are well characterized because of the locations within the Hanford Site that are being considered for this proposal; therefore, radioactive materials should not be unexpectedly encountered.

Hazardous materials could be encountered anywhere along the proposed route and could include such things as illegally dumped waste, drug lab chemicals, spilled petroleum products, pesticides, and other wastes.

The 500-kV Schultz Substation has no transformers on site. A small amount of oil is in the power circuit breaker compressors and in the series capacitor cans. Contaminated oil, or polychlorinated biphenyl (PCB), may be present in the power circuit breakers and capacitor cans. There is no oil spill containment system for this substation, but BPA does have a Spill Prevention Control and Countermeasure Plan that puts in place protocols and procedures for response in case a spill or leak occurs.

The 500-kV Hanford Substation also has no transformers on site. Similar to the Schultz Substation, a small amount of oil is in the power circuit breaker compressors and in the shunt capacitor cans. PCBs may be in the compressors, but no PCBs are present in the shunt capacitor. This substation site also has a diesel tank that runs an engine generator. There is no oil spill containment system at this substation, but like Schultz Substation, BPA has a Spill Prevention Control and Countermeasure Plan in case a spill or leak occurs.

The 230/500-kV Vantage Substation includes a number of transformers on site that may contain PCBs. There are also two oil tanks on site. Unlike the Schultz and Hanford Substations, this substation does have an oil spill containment system in place for the two 500-kV transformer banks on site. It also has a Spill Prevention Control and Countermeasure Plan.

3.12.5 Fire

Numerous wildfires have occurred on private and public land in and around the proposed routes over the past several years. They may have been caused by human actions such as vehicle ignitions from roads, unattended campfires, burning of adjacent agricultural lands and arson, or by natural causes such as lightning.

Between 1980 and 1997, there were six different wildfires that either started on or threatened public land in the Saddle Mountains Management Area. The cause of these fires ranged from lightning strikes to equipment use and railroad operations (BLM 1997). Fires have also affected the Saddle Mountains Unit of the Hanford Reach National Monument from similar causes.

Due to the nature and intensity of the training that occurs at the YTC, the incidence of fire is higher on YTC land than on adjacent lands. The risk of fires at the YTC is largely dependent on the intensity, duration, and season of training activities taking place. The use of tracers and pyrotechnic devices as well as live-firing activities increases the fire risk (U.S. Army 1996). Fire management is addressed in the management plan for the YTC (U.S. Army 1996).

The Hanford Reach National Monument was established in June 2000. A Fire Management Plan has been completed that will provide for the perpetuation of natural conditions and processes within the monument/refuge, while managing wildlife fire to protect life, property, and cultural resources. This plan will help reduce hazards associated with unplanned fire events (U.S. DOI/USFWS 2001).

Farmers throughout the state, including those in central Washington near the line segments, burn agricultural fields to remove the remaining plant material after harvest and prepare for planting the next crop. In order to meet the requirements of the Washington State Clean Air act of 1991, a statewide agricultural burning permit program has been implemented. This program includes permit conditions on when burns may occur and what materials may be burned (WAC 173-430). BPA does not expect to conduct any outdoor burning.

For Your Information

There are no air quality monitoring sites within the study area. The nearest monitoring sites are located around the City of Yakima to the west/southwest, in the Wenatchee Valley to the north/northeast, and in the City of Ellensburg to the west. The sites in the Wenatchee Valley and Ellensburg were installed as a result of special monitoring studies that showed the potential for violations in several new areas across the State, including Wenatchee, Ellensburg, and parts of the Columbia plateau (DOE Overview 1997-1999).

3.13 Air Quality

In Washington, local clean air authorities have the primary responsibility for improving air quality. In areas with no local clean air authorities, the Washington Department of Ecology (WDOE) assumes responsibility. In the four counties where the study area is located, two local clean air authorities and two regional WDOE offices work together to control, monitor, and prevent air pollution:

- Benton Clean Air Authority: Benton County
- Yakima Regional Clean Air Authority: Yakima County
- USDOE Central Regional Office: Kittitas County
- USDOE Eastern Regional Office: Grant County

In 2000, the sources of air pollution in Eastern Washington were motor vehicles (53 percent), industry emissions (12 percent), agricultural (11 percent), outdoor burning (11 percent), wood stoves (7 percent), and other (6 percent) (WDOE, *Washington Environmental Health 2000* website).

Data from air quality monitoring sites has shown that air quality is improving across the State of Washington. However, there are still a few ***nonattainment areas*** scattered throughout the State. These nonattainment areas are not located within the study area.

*A **nonattainment area** is a geographic region designated by EPA in which federal air quality standards are not or were not met by a certain date. There are six air pollutants that are monitored; particular matter (PM), carbon monoxide (CO), ozone (O3), nitrogen dioxide (NO2), sulfur dioxide (SO2), and lead (Pb).*

Statewide trends for particulate matter show decreasing levels of PM-10. Some eastern Washington areas showed increased levels in 1999, although the overall trend tended to decrease or remain constant (WDOE *1999 Air Quality Trends*). The majority of the times when the PM-10 air quality standards are exceeded, it is a result of natural events (dust storms).

Air quality has a direct effect on visibility. The Federal Clean Air Act (Section 160) and its amendments require that air quality be preserved, protected, and enhanced in specific areas of national or regional natural, recreational, scenic, or historic value.

*Section 160 of the federal Clean Air Act requires the preservation, protection, and enhancement of the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic or historic value. The 1977 Clean Air Act amendments called for a list of existing areas to be protected under section 160. These are called **Class 1 areas**.*

These areas are designated as ***Class 1***. There are eight mandatory Class 1 areas in the State of Washington where the protection of visibility is required. In these areas, there are restrictions on the use of land and resources in order to avoid damaging visibility, plants, and other resources. There are no Class 1 areas in the study area.