

CHAPTER 13

NATURAL SETTING

ELEMENT

INTRODUCTION

The Natural Setting Element describes the physical and biological setting of the City. Critical areas and cultural resources within the City are identified, including their "functions and values," and the current trends associated with regulatory protections for those resources. This element also presents Electric City's approach for the protection of critical resources. Critical area designations "overlay" other land use designations. That is, if two or more land use designations apply to a given parcel or portion of a parcel, both or all designations apply.

PURPOSE OF ELEMENT

The Natural Setting element emphasizes the conservation and protection of our natural environment while preserving people's lifestyles and property. Electric City and the communities within it can and will continue to grow, but this growth must occur in a way that balances nature's needs with our own. By embracing a philosophy of sustainable land use management, the City can help prevent many environmental problems and avoid the unforeseen costs associated with correcting them.

The Natural Setting Element serves two purposes. The first is to clarify the relationship between the natural environment and our built environment. The second is to provide the basis for Chapter 16.10 of the Electric City Municipal Code (ECMC) (as it now exists or hereinafter amended). The ordinance provides guidelines for the designation and classification of natural resource and critical area lands and establishes regulations for their protection.

This element further discusses classification and identification of such areas. By providing criteria that can be considered during the review of a development proposal, this element assures there is a tool not only to meet the requirements of the GMA, but also to maintain these valuable resources that help define the quality of life in Electric City. It is not the Intent, however, to require existing uses to be subjected to these criteria unless a change in land use is proposed in the form of a development application.

Environmental degradation or depletion of our natural resources negates some of the many reasons people wish to live here. Sensitive areas such as wetlands, open spaces, and fish and wildlife habitat contain much of the natural wealth valued by City

residents. Other sensitive areas, such as land located outside fire districts or those prone to flooding are important because of the risk to lives and property posed by developing in them.

EXISTING CONDITIONS

Climate

The climate is a consideration in land use planning. For example, the condition of roadways, public transit, and pedestrian/bicycle pathways is affected by the climate. Temperature variations are significant factors in the level of energy usage, and annual precipitation provides a source of water. The climate also influences economic activity, most notably agricultural production.

The Electric City Area is classified as an arid-desert region where summers are warm and dry. Precipitation falls mostly as snow in the winter months. Marine air masses originating in the west move eastward toward the Cascade mountain range where they lose their moisture before reaching the Columbia Basin. The Pacific high weather systems over Washington move northward in the summer, causing increasingly predominant northerly winds and bringing clear skies and warm temperatures. From June to September the general flow of air over the State becomes weaker resulting in storm systems caused by the southward movement of these air masses. Prevailing surface wind direction in the winter is out of the southwest and frequency of higher velocities is increased.

Regional temperature data collected recorded an eleven-year average monthly temperature for the years 1982 to 1992 of 50 degrees Fahrenheit (10 degrees Celsius). Extreme temperatures over 100 degrees Fahrenheit (37 degrees Celsius) typically occur in July and August. Minimum temperatures below -10 degrees Fahrenheit (-23 degrees Celsius) were recorded in the winter months. Precipitation is also greatest during the winter months of November through January. The eleven-year average precipitation was 11.575 inches (294cm) per year. Snowfall occurs between November and March with the highest percentage occurring in December.

The difference between daily high and low temperatures varies from as little as 15° F in January to as much as 40° in July. According to U.S. National Oceanic and Atmospheric Administration records, the dry air results in a rapid temperature fall in the evening, particularly noticeable in the early fall and late spring. The frost-free season is 140 to 160 days in length from late April to late September.

Soils

The load-bearing capacity of soil, the hydric properties, erosion potential, and

characteristics with respect to shrink-swell all play a significant role in development of land. In particular, the hydric properties determine the potential for septic tank usage, indicate the existence of wetlands, and signal the potential for other environmental concerns. In addition, soils are the primary determinant in designation of "unique" or "prime" agricultural land.

The Natural Resource Conservation Service has generally characterized the surficial soils in Electric City as very shallow to very deep and well drained to excessively drained. These soils are formed in glacial outwash, loess, lake deposits, and alluvial and colluvial deposits from rivers, streams, and surface water runoff. Soils on the outwash range from sandy loams to silty loams and generally are gravelly in profile. The glacial outwash and the alluvium along existing streams such as Crab Creek yield large quantities of water. Soils on lakebeds are compacted, stratified silts. The loess and other windblown deposits range from sandy to silty. These soils erode easily.

The Soil Survey conducted by the U.S. Soil Conservation Service includes detailed soil maps that can be used for site selection and planning. The survey explains in great detail each soil's suitability for agricultural, residential, sanitary facility, recreational, woodland wildlife habitat and other land uses. The primary soils in the coulee are nearly level, well drained, and coarse textured. These soils extend from 0 to 30 feet over a deep but variable amount of gravel and rock.

Twelve different types of soils are found in Electric City and the immediately adjacent area. Generally, these soils are not conducive to agricultural pursuits. For the most part soils are permeable and erosion is low to moderate. A soils map may be found at the end of this chapter.

Geology

The geology of the Grand Coulee Dam Area is quite complex due to its location on the boundary between the Columbia River Plateau and the Okanogan Highlands. Although there is some overlap between these two geographic provinces, generally the east and north sides of the Columbia River are dominated by granite and metamorphic rocks of the Colville batholith, which make up the bedrock complex underlying this part of the Okanogan Highlands. The areas west and south of the river are dominated by the basalt, clays and shales of the Columbia River Group.

Topography

About one million years ago, the Columbia River flowed along nearly the same

route it follows today. Then, the Okanogan Ice Lobe came down from the north and blocked the river near the present site of the Grand Coulee Dam. As the water rose, it started carving out the basalt cliffs on its southeast side and soon began flowing through what is now the Grand Coulee (Coulee means: bed of a stream). It carved a stream bed 4 miles wide and 800' deep through the basaltic lava of the Columbia Plateau. Differential erosion occurred due to the presence of resistant rock material. After the ice melted, the river returned to the previous channel and the Grand Coulee left dry. The Grand Coulee remained in this state until it was dammed on either end, filled with water from behind Grand Coulee Dam and christened Banks Lake in the 1952.

The elevation in the City of Electric City varies from approximately 1570' on the northeast side along the shoreline of Banks Lake up to 1869' in the south-central portion of the City and its Urban Growth Area, near the gravel pits. Many basalt out-croppings are present throughout the community and natural changes in elevation create many areas where development is not possible without significant alteration in the landscape.

Hydrology

The hydrology of the Grand Coulee Dam Area consists of both surface and ground water elements. The principal surface waters in the area are Franklin D. Roosevelt Lake upstream of Grand Coulee Dam, the Columbia River below the Dam and Banks Lake in the Grand Coulee southwest of the Dam. Banks Lake is filled and the level maintained by a system of large pumps which lift water from the Dam up to the Lake. The surface elevation of the lakes and River is controlled by operation at the Dam depending upon power and irrigation requirements.

Groundwater drainage in the area is dependent on the underlying bedrock. The granite in the area is hard, dense and impermeable, but numerous joints and fractures produce possible passages for the flow of water. This is also true of the basalt which is fractured and porous due to rapid cooling. The basalt gravel and glacial-fluvial deposits are highly permeable and free-draining; the later being prone to rapid erosion on steepened slopes. The clay and shale deposits of the Latah Formation are relatively impermeable and non-water bearing. The permeability of the Nespelem silts varies throughout the area, but it is generally very low.

Air

One of mankind's most basic needs is the air we breathe. Polluted air contributes to a variety of health problems and consumes millions of dollars in medical costs each year. Polluted air also obscures visibility, creates unpleasant odors, and adversely affects animal and plant life. The attractiveness and livability of Electric City is

directly related to the quality of our air. Air quality In the City is generally good, because of the lack of industrial development and the low population density.

The Washington State Department of Ecology and the U. S. Environmental Protection Agency (EPA), who monitor air quality, have designated Electric City as an area currently in attainment for all standards. However, Electric City does not have permanent or mobile monitoring stations.

The one pollutant of concern in Grant County is Total Suspended Particulates. Particulate sources include industrial point sources, such as manufacturing plants, and area sources, such as dirt roads and plowed fields. Because of the general lack of industrial sources, area sources are of greater importance due to the prevalence of wind erosion. Wind erosion is greatest during the spring and fall, when high winds and dry soil conditions create dust storms of varying severity. The severity of dust storms is exacerbated by dryland agricultural practices, which expose the soil during spring cultivation and fall harvesting periods.

Another source of particulate matter is from the agricultural practice of burning field residue following harvest, particularly for commercial grasses. These open burning procedures produce large amounts of smoke that contains high levels of particulate matter and gases that are harmful to human health. The burning season is about a month in duration in late August and September. Although considerable smoke management technique is used to direct smoke from population centers, emissions are not reduced.

In response to Legislative action, Ecology adopted a rule in March 1996 to reduce grass seed field burning. The intent of the rule is to replace burning with mechanical residue management.

In recent years smoke from wildland fires both near and far have blanketed the community with smoke for days and sometimes weeks at a time. Little can be done about smoke that can blow in from fires burning within hundreds of miles.

Water Supply

As with much of the West, water in Electric City serves competing, and often conflicting, uses. Securing certainty in our water supply will be a major issue over the 20-year planning period. Reliable access to water is necessary for direct human uses like household, agricultural, commercial, and industrial operations, and for indirect human needs such as recreation.

If we are to sustain growth, every resident within Electric City must meet the ongoing challenge of protecting and managing our water resources, and resisting proposals for elimination of the public investment we have made in reclamation and

flood control projects and in economic, environmentally benign electrical power production.

Water Quality

The water quality of our streams, hikes, and ground water influences the domestic, economic, recreational, natural and manmade environments of Electric City. We all need clean water for daily use in our homes. Residents and tourists alike use our lakes and streams extensively for recreational activities such as boating, fishing, and swimming. Many industries require clean water for manufacturing processes.

In many areas of Washington State, clean water has been taken for granted. As growth and development have increased, so have the problems associated with maintaining water quality. From industry to the individual, and commercial business to agriculture, each of us contributes in some way to reduced water quality. From this perspective, each of us must work towards its protection.

In Electric City, the Impact to water quality is predominantly influenced by the Columbia Basin Project. Those impacts have been largely beneficial ones. Prior to implementation of the Project, many water bodies in the City were seasonally fed, becoming stagnant pools during dry summer months. Development of the Project enhanced such water bodies, created significant amounts of fish and wildlife habitat, and enhanced water quality.

Vegetation and Wildlife

The majority of Electric City is developed land that contains deciduous and coniferous trees such as elm, maple, oak, locust, native pine, and native fir, as well as native shrubs and grasses. Areas on the fringes of the community are native rangeland characterized by shrub/steppe vegetation comprised mainly of grasses, forbs, and shrubs contain habitat for eagles, coyote and deer. The more developed areas are also frequented by wildlife including raccoons, deer, rodents and a variety of birds. In addition, there is a narrow zone of riparian vegetation along the shoreline of Banks Lake. Banks Lake also supports a variety of fish and invertebrate species.

The State Department of Fish and Wildlife has developed Priority Habitat and Species lists and maps for the entire state. The City lies within Region 2. While many priority species and habitats exist within the region, very few, if any are found in Electric City and it's UGA. In addition, the Department of Fish and Wildlife Priority Habitat and Species program is constantly revising the data to reflect new information. Because of this the City has chosen to approach required protection of critical areas on a case- by-case

basis with a focus on those areas that are presently undeveloped. A map containing Priority Habitat and Species areas is included at the end of this Chapter.

Wetlands

Wetlands are fragile ecosystems that assist in the reduction of erosion, flooding, and ground and surface water pollution. Wetlands also provide important habitat for wildlife, plants and fisheries. Wetlands within the City and UGA are part of a regional network of wetlands serving a variety of ecological and human functions. Because of this connection it is important that the functions and values of existing wetlands be protected, and where possible restored, as the community continues to develop. A wetlands map for the City based on the NWI map is included at the end of this Chapter.

Frequently Flooded Areas

The Federal Emergency Management Agency has defined areas showing the extent of the floodway and 100-year flood boundaries in order to establish actuarial flood insurance rates and assist communities in efforts to promote sound floodplain management. Development on floodplains retards their ability to absorb water, restricts the flow of water from land areas, and can create downstream hazards.

Currently, best available science¹ that indicates the location or existence of frequently flooded areas within the City limits or its UGA is provided by the Federal Emergency Management Agency. There are no mapped flood hazard areas with the City or its UGA.

GROWTH MANAGEMENT

Growth management, natural resource land conservation, and critical areas protection share problems related to governmental costs and efficiency. Sprawl and the unwise development of areas susceptible to natural hazards may lead to inefficient use of limited public resources, jeopardize environmental resource functions and values, subject persons and property to unsafe conditions, and affect the perceived quality of life. It is more costly to remedy the loss of critical areas than to conserve and protect them from loss or degradation. The inherent economic, social, and cultural values of critical areas should be considered in the development of strategies designed to conserve and protect lands.

In recognition of these common concerns, classification and designation of

¹ - The City considers the Federal Emergency Management Agency's flood hazard maps as the best available science for the location and typing of frequently flooded areas. At present, the City is unmapped with the surrounding UGA covered by FIRM Map 530049 0025 BDI. The only areas indicated as subject to 100-year floods are below the regulated high-water line of Banks Lake.

critical areas is intended to preclude land uses and development that are incompatible with critical areas. There are qualitative differences between critical areas: some are critical because of the hazard they represent to public health and safety; others because of the values they represent to the public welfare. In some cases, the risk posed to the public by use or development of a critical area can be mitigated or reduced through design; in other cases that risk cannot be effectively reduced except by avoidance of the critical area. Therefore, classification and designation of critical areas is intended to recognize the differences among these areas, and to develop appropriate regulatory and non-regulatory actions to respond to the differences.

Implementing development regulations that preclude uses and development that are incompatible with critical areas does not mean a prohibition of all uses or development. Rather, it means governing changes in land uses, new activities, or development that could adversely affect critical areas. Thus, for each critical area, classification schemes should be defined and development regulations prepared that govern changes in land uses and new activities by prohibiting clearly inappropriate actions and restricting, allowing, or conditioning other activities as appropriate.

Critical area designations "overlay" other land use designations. That is if two or more land use designations apply to a given parcel or portion of a parcel, both or all designations shall be made.

REQUIREMENTS OF OTHER PLANS

GMA Goals

The Washington State Growth Management Act (GMA) does not require a Natural Setting Element, but it does require that it address the following related goals:

1. **Natural Resource Industries** - Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands and discourage incompatible uses.
2. **Open Space and Recreation** - Encourage the retention of open space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands, and discourage incompatible uses.
3. **Environment** - Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
4. **Historic Preservation** - Identify and encourage the preservation of lands,

sites, and structures that have historical or archeological significance.

Critical Areas

Critical Areas and Cultural Resources Critical areas are ecosystems, landforms, or processes that are protected under the Washington State GMA for the biological or physical functions and values that they provide. Critical areas are categorized by Electric City as follows:

- Wetlands;
- Frequently;
- Flooded Areas;
- Critical Aquifer Recharge Areas;
- Geologically Hazardous Areas;
- Fish and Wildlife Habitat Conservation Areas; and,
- Cultural Resource Areas

Critical areas such as wetlands, open spaces, and fish and wildlife habitat contain much of the fish and wildlife, their habitats and other natural resources valued by City residents. Other sensitive areas, such as land located outside fire districts or those prone to flooding are important because of the risk to lives and property posed by developing in them. Critical areas in Electric City also include cultural and historic resources which include those areas or structures that have historic or archaeological significance. Cultural and historic resources protections help the City comply with state and federal laws and regulations as they protect these sensitive resources. Critical Areas and Cultural Resources (ECC Chapter 16.10) is being updated in 2019 to include the latest information and standards for designating and protecting natural resources and critical area lands. The key functions and values provided by the five critical areas in Electric City can be summarized into four major functions, which include: 1) water quality, 2) hydrology, 3) soil, and 4) habitat. These functions and values are summarized in Table 13-1. The following sections include descriptions, current trends, and future considerations for each of the critical areas.

Table 13-1 Critical Area Functions Critical Areas	Key Functions			
	Water Quality	Hydrology	Soil	Habitat
Wetlands	✓	✓		✓
Frequently Flooded Areas	✓	✓	✓	✓
Critical Aquifer Recharge Areas	✓	✓		
Geologically Hazardous Areas (Erosion)	✓	✓	✓	✓
Fish and Wildlife Habitat Conservation Areas	✓	✓	✓	✓

Note: Cultural resource areas are included as critical areas in the CAO but are addressed separately in Section 11.3.4.

Maps and References:

Electric City maintains a series of data maps containing the best available graphic depiction of critical areas in the City for the purpose of administering Chapter 16.10 ECMC. These maps are for information and illustrative purposes only and are not regulatory in nature.

The maps are intended to alert the development community, appraisers, and current or prospective owners of a potential encounter with a use or development limiting factor based on the natural systems present.

The indication of the presence of a critical area on the maps is sufficient cause for the City to request a site-specific analysis for the critical areas identified prior to acceptance of a development application as being complete and ready for processing. The maps are to be used as a general guide to the location and extent of critical areas. Critical areas indicated on the maps are presumed to exist in the locations shown. The exact location and extent of critical areas shall be determined by the applicant as a result of field investigations performed by qualified professionals using the definitions found Section 18.05.010 and Chapter 16.10 ECMC. Also see **Maps 13-1 through 13-__** in the Map Appendix for the general location of critical areas in Electric City.

Wetlands:

Wetlands are transitional areas between water and land, where the water table is at or near the surface of the soil. Wetlands are characterized by certain plant types, wet soils, and water (the presence of which may change with the seasons or even from day to day). Some wetlands are easy to identify bogs, marshes, estuaries, and swamps are good

examples of these. Others are less obvious, and may actually be dry during the summer months.

Washington uses the same definition for wetlands as the federal government. Under that definition, wetlands are:

...areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes bogs and similar areas. [RCW 36.70A.030(20)]

Some wetlands, such as swamps or marshes, are easy to identify, while others are less obvious and may actually be dry during the summer months. In general, wetlands are areas where the soil is wet for a long enough period of time that:

- soils become depleted of oxygen, and
- wetland vegetation is more prevalent than upland vegetation.

All three of these characteristics must be present for an area to be considered a wetland (hydrology, soil type, and vegetation).

Wetlands are important ecosystems that serve many beneficial functions. Wetlands can help reduce erosion and siltation; provide filtration and produce cleaner water; retain water to reduce flooding and support base flows; and provide wildlife, plant, and fisheries habitats. Vegetative growth along Banks Lake in Electric City improves food, cover, and nesting habitats for many wildlife species, which also provide recreational opportunities.

In Electric City, the wetland environment is predominantly associated with Banks Lake. Map 13-1 in the Map Appendix contains the National Wetlands Inventory data for the Electric City Area.

In Electric City, wetlands are protected under the CAO as a resource vital to sustaining biological productivity and water quality. Wetland habitat is commonly affected by development, resulting in habitat fragmentation and/or losses. Other activities affecting wetlands include agricultural practices and changes in irrigation efficiencies. Wetland destruction or impairment may result in increased public and private costs or property loss. Updates to the CAO have been made to improve protection of wetlands from these activities using best available science, and consistent with the Electric City SMP (Chapter 16.20 ECMC). Currently available resources for determining the approximate location of wetlands in Electric City:

- U.S. Fish and Wildlife Service National Wetlands Inventory (<https://www.fws.gov/wetlands/>);
- WDFW Priority Habitats and Species Maps (<http://wdfw.wa.gov/mapping/phs/>);
- Grant County Geographic Information System Maps (<http://www.grantcountywa.gov/GIS/>).

To confirm if wetlands are present, a wetland delineation is conducted by a professional using methods approved by the U.S. Army Corps of Engineers and verified using local rating systems. The Ecology Wetland Rating System is used to rate wetland soils in Washington State. Wetland delineation and verification resources are available here:

- Ecology Wetlands Page (<http://www.ecy.wa.gov/programs/sea/wetlands/ratingsystems/index.html>)

1. Classification

Wetlands shall be identified and delineated by a qualified wetland professional in accordance with the Washington State Wetlands Identification and Delineation Manual (Ecology Publication #96-94, or as revised and approved by Ecology). Wetland delineations are valid for five years and performed using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1987, as amended); and the US Army Corps of Engineers. (2006) Regional Supplement to the 1987 Delineation Manual: Arid West Region. The City may use the following information sources as guidance in identifying the presence of wetlands and the subsequent need for a wetland delineation study;

- Hydric soils, soils with significant soil inclusions, and "wet spots" identified within the local soil survey;
- National Wetlands Inventory;
- Previous wetland rating evaluation; and,
- On-site inspection

Wetlands shall be rated according to the Washington Department of Ecology wetland rating system, as set forth in the Washington State Wetland Rating System for Eastern Washington (Ecology Publication #04-06-015, or as revised and approved by

Ecology). Wetlands in Electric City shall be classified into the following categories according to the manual referenced above:

Category I - Category I wetlands are:

- a. alkali wetlands;
- b. wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as high-quality wetlands;
- c. bogs;
- d. mature and old-growth forested wetlands over ¼ acre with slow-growing trees;
- e. forests with stands of aspen; wetlands that perform many functions very well (scores of 70 points or more)

Category I wetlands are those that:

- a. represent a unique or rare wetland type; or
- b. are more sensitive to disturbance than most wetlands; or
- c. are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or
- d. provide a high level of function.

We do not wish to risk any degradation to these wetlands. Generally, these wetlands are not common and make up a small percentage of the wetlands in Eastern Washington. Category I wetlands include alkali wetlands, bogs, Natural Heritage wetlands, mature and old-growth forested wetlands with slow growing trees, and wetlands that perform many functions well, as measured by the rating system.

Category II - Category II wetlands are:

- a. Forested wetlands in the floodplains of rivers;
- b. Mature and old-growth forested wetlands over ¼ acre with fast growing trees;
- c. Vernal pools; or
- d. Wetlands that perform functions well (scores between 51-69 points).

These wetlands are difficult, though not impossible, to replace. They provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a high level of protection.

Category III - Category III wetlands are:

- a. Vernal pools that are isolated; or

- b. Wetlands with a moderate level of functions (scores between 30-50 points).

Wetlands scoring between 30 and 50 points generally have been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.

Category IV - Category IV wetlands have the lowest levels of functions (scores fewer than 30 points) and are often heavily disturbed. These are wetlands that we should be able to replace, and in some cases improve. These wetlands may provide some important functions and also need to be protected.

2. Designation

To date there has been no wetlands specific mapping done specifically for Electric City other than the U.S. Fish and Wildlife Services National Wetlands Inventory (NWI) maps. To remedy this, the City should pursue an accurate accounting of all wetlands in its planning area based on the Washington State Wetlands Rating System for Eastern Washington. However, until funding is obtained to conduct a comprehensive inventory of wetlands, the National Wetlands Inventory (NWI) maps shall be used as a base designation. Map 13-1 Wetlands in the Map Appendix, along with other supportive documentation, shall be used to review development proposals, but because the National Wetlands Inventory was done at such a broad scale, local verification according to the classification criteria shall be part of the standard process for identifying and designating wetlands.

Frequently Flooded Areas:

Frequently flooded areas are defined as floodplains or other areas designated as being within a 100-year or greater floodplain by FEMA's Federal Insurance Rate Maps (FIRM). FEMA has defined the extent of the 100-year floodplain to establish actuarial flood insurance rates and to assist communities in efforts to promote sound floodplain management. According to FIRM Map 53025C0050C, effective on 2/18/2009, Electric City is an area of "minimal flood hazard" with no frequently flooded areas identified.

Critical Aquifer Recharge Areas:

Aquifer recharge areas are defined as follows:

Aquifer Recharge Areas - Areas which, due to the presence of certain soils, geology, and surface water, act to recharge ground water by percolation.

Critical Aquifer Recharge Areas - A Critical Aquifer Recharge Area (CARA) is defined by the GMA as areas with a critical recharging effect on aquifers used for potable water².

Critical aquifer recharge areas are groundwater aquifers that provide protections to public drinking water supplies and are typically located near cities and towns. Electric City's potable water comes from groundwater sources. Once a potable water source is contaminated, it is difficult, costly, and sometimes impossible to clean up. Therefore, preventing contamination of these water sources is necessary to avoid public costs, hardships, and potential physical harm to people.

As precipitation reaches the earth it typically forms into snow pack, enters lakes, streams, rivers, oceans, or wetlands, seeps into the soil and plant roots, or filters into the ground into groundwater basins. The land surface where this filtering process takes place is called an aquifer recharge zone. Aquifer recharge zones warrant special protection from surface pollution to protect the quality of the groundwater in the area. Groundwater often moves through the ground, eventually discharging to surface water features, such as lakes, streams, or rivers, which in turn recharges the groundwater. The water remaining in the ground makes up the aquifer.

Electric City is located within the Columbia Basin GWMA, an area designated for protecting groundwater and addressing groundwater issues. Of the 3 public water supply system wells recorded within Electric City, more than half of them are shallow wells that could be considered domestic supply wells with the highest potential susceptibility to contamination. The remaining public water supply wells are deeper wells, which likely receive their recharge outside of the wellhead protection areas. Consequently, the deeper wells would be considered to have lower susceptibility to contamination from surface activities occurring within Electric City, as recharge occurs outside of the City. Continued protection and management of critical aquifer recharge areas in and around Electric City is imperative to reducing pollution and maintaining water storage levels for future use. The Grant County Conservation District provides resources to landowners to educate them on the impact of land management practices on groundwater and groundwater quality. Programs include irrigation water management, lawn care, livestock management, and water quality and quantity programs. Other groundwater-related information is available at the following resources:

² - WSDOE Critical Aquifer Recharge Areas Guidance Document January 2005
Publication Number 05-10-028 p. 2

- U.S. Geological Survey Groundwater Information Pages (<https://water.usgs.gov/ogw/>)
- Ecology Groundwater Quality Webpage (<http://www.ecy.wa.gov/programs/wq/grndwtr/index.html>)
- Columbia Basin GWMA Subsurface Mapping and Aquifer Assessment Project (Columbia Basin GWMA 2009)
- Grant County Conservation District webpage (<http://www.columbiabasincds.org/>)

1. Classification

In _____ of _____ the City adopted an updated Comprehensive Water Plan as required by the Washington State Department of Health to comply with the federal Safe Drinking Water Act. The purpose of such a plan is to provide an organized approach to effectively protect drinking water supplies from contamination and includes a Wellhead Protection Plan (WHP).

An Aquifer Susceptibility Assessment is a key component of a WHP. Susceptibility is a qualitative measure of how quickly and how far groundwater must travel to reach a water source (well or spring). Such information is useful in determining the existence of Aquifer Recharge Areas, and the extent of regulation necessary to protect local aquifers. A map of the Wellhead Protection Areas for Electric City is included as Map 13-2 in the Map Appendix.

In addition to the Wellhead Protection Areas, it is generally acknowledged that the following areas have the potential to allow contaminants to enter the aquifer: rivers and creeks especially at their headwaters, wetlands, lakes and ponds, alluvial fans, and areas within the 100-year flood plain. These areas are usually lower in elevation than their surrounding landscape. Therefore, coupled with certain porous soil types as identified by the Natural Resources Conservation Service (NRCS) Web Soil Survey³, these areas are considered to have the potential for allowing contaminants to enter the aquifer and should be afforded a higher degree of protection than other areas. The following three-level classification scheme is used to determine the level of protection necessary for land areas:

- Critical Potential - Rivers, creeks, wetlands, lakes and ponds; and lands that have been specifically identified as critical recharge areas based on reliable scientific data. This classification also includes the following soils:

193 – Miscellaneous water

3 - Data obtained from Web Soil Survey site June 2019.

194 - Water

- **High Potential** - Lands adjacent to rivers, creeks, wetlands, lakes and ponds, including areas of the 100-year floodplain and soils that are shown to be excessively well drained and/or somewhat excessively well drained with Ksat values above 10^4 according to the 2009 Soil Survey. This classification includes the following soils:
 - 97 - Quincy fine sand, 2 to 15 percent slopes
 - 98 - Quincy loamy fine sand, 0 to 15 percent slopes
 - 99 - Quincy loamy fine sand, 15 to 35 percent slopes
 - 120 - Rubble land-Rock outcrop complex
- **Moderate Potential** - Lands with soils that are moderately well drained or well drained⁵ with a Ksat value above 10^6 in the 2009 soil survey. This classification includes the following soils:
 - 39 - Rock outcrop complex, 25 to 65 percent slopes
 - 146 - Strat gravelly loam, 0 to 15 percent slopes
 - 147 - Strat cobbly loam, 0 to 15 percent slopes
 - 148 - Strat stony loam, 0 to 25 percent slopes

2. Designation

No aquifer recharge areas are known to have been mapped within the City or surrounding planning area. Therefore, aquifer recharge areas in City shall be designated as “potential” in accordance with the classification provisions. Because the classification focuses on areas where soil types provide the potential for recharge or for contaminants to enter the aquifer, protections shall be broad enough to preserve essential aquifer recharge functions and values.

Map 13-3 in the Map Appendix provides soil data that enables designation of potential aquifer recharge areas using the preceding classification system. It is important to note that the map is only general in nature and is based on the soil characteristics from the 2009 Soil Survey. Map 13-3 is intended to identify those areas, based on soil

4 - Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

5 - based on drainage class per soil type 2009 Soil survey

6 - Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

characteristics, where contaminants may enter the aquifer and/or surface waters more readily than other areas. Specific projects will require more detailed site analysis prior to development.

Geologically Hazardous Areas:

Geologically hazardous areas are defined per RCW 36.70A.030 (10) as “areas that, because of their susceptibility to erosion, sliding, earthquake or other geologic events, are not suited to the siting of commercial, residential or industrial development consistent with public health or safety concerns.” According to the Electric City CAO, geologically hazardous areas include:

- Erosion Hazards: Areas identified by the USDA NRCS as having high or very high-water erosion hazard
- Landslide Hazards: Areas potentially subject to landslides based on a combination of related geologic, topographic, and hydrologic conditions (e.g., steep slopes, alluvial fans, high velocity stream banks)
- Mine Hazards: Areas within or within 100 horizontal feet of a mine opening at the surface or those areas designated by DNR as a mine hazard area
- Seismic Hazards: Areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, soil liquefaction, or surface faulting

Development within geologically hazardous areas can result in a potential risk to health and safety. In some cases, the risk can be reduced or mitigated to acceptable levels by engineering design or modified construction practices. However, when the risks cannot be sufficiently mitigated, development should be prohibited. Future development within or near geologically hazardous areas should be carried out consistent with the City’s CAO. The Electric City CAO includes a list of references for identifying geologically hazardous areas. Additionally, site assessment protocols, protection requirements, and mitigation measures are provided for development within each geologically hazardous area type.

The following references are available for determining the general location and extent of geologically hazardous areas:

- U.S. Geologic Survey Geologic Hazards Science Center (<https://www.usgs.gov/centers/geohazards>)
- DNR Geologic Information Portal (<https://www.dnr.wa.gov/geologyportal>) •

- Grant County Geographic Information System Maps (<http://www.grantcountywa.gov/GIS/>)

1. Classification

Erosion Hazards: Erosion can be a common occurrence due to hydrologic and geologic characteristics, vegetative conditions, wind and human land use. Electric City's soils are generally characterized by loamy and sandy soils, which are very deep, fertile, and highly erodible soils deposited through lake settling or by wind from the post-glacial outwash. Erosion hazard areas are classified as those areas where soils with an NRSC "K" rating⁷ of .20 or higher and slopes of 25% or greater are found. Minimizing or mitigating for development in these areas can help to reduce the damage to natural and built environments. The following soils meet both classification criteria and are shown in on Map 13-3 in the Map Appendix:

- 39 - Rock outcrop complex, 25 to 65 percent slopes
- 99 - Quincy loamy fine sand, 15 to 35 percent slopes
- 148 - Strat stony loam, 0 to 25 percent slopes

Landslide Hazards: Landslide hazard areas are those areas within Electric City that are subject to potential slope failure. Steep slopes (25% or greater) in the City are generally located near rock outcrops and along the shore of Banks Lake. Regulations should continue to be followed to protect public health and safety from development located on, or adjacent to, steep slope or landslide areas, preserve the scenic quality and natural character of Electric City's hillsides, and to protect water quality. The following soils meet both classification criteria and are shown in on Map 13-3 in the Map Appendix:

- 39 - Rock outcrop complex, 25 to 65 percent slopes
- 99 - Quincy loamy fine sand, 15 to 35 percent slopes
- 148 - Strat stony loam, 0 to 25 percent slopes

Seismic Hazards: Seismic hazard areas are generally associated with active fault areas and earthquakes. While earthquakes cannot be eliminated, there

7 - Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

are no areas in Electric City that have been identified that pose significant, predictable hazards to life and property resulting from the associated ground shaking, differential settlement, and/or soil liquefaction.

Mine Hazards: Mine hazard areas are defined as "areas directly underlain by, adjacent to, or affected by mine workings such as adits, tunnels, drifts, or air shafts." Mine hazards may also include steep and unstable slopes created by open mines. There has been minimal, if any, historical subsurface mining in Electric City due to the geology in the area.

2. Designation:

Erosion Hazards: Erosion hazard areas are designated on Map 13-3 in the Map Appendix.

Landslide Hazards: Landslide hazard areas are designated on Map 13-3 in the Map Appendix.

Seismic Hazards: No Seismic hazard areas have been designated in Electric City or its UGA.

Mine Hazards: No Mine hazard areas have been designated in Electric City.

Fish and Wildlife Habitat Conservation Areas:

Fish and wildlife habitat conservation areas include streams, riparian vegetation, and upland habitats that provide habitat to support fish and wildlife species throughout their life stages. These include ranges and habitat elements where endangered, threatened, and sensitive species may be found, and areas that serve a critical role in sustaining needed habitats and species for the functional integrity of the ecosystem, and which, if altered, may reduce the likelihood that the species will persist over the long term. These areas provide key ecological functions for water quality, hydrology, soil health, and habitat.

Electric City provides limited habitat for a variety of birds and large mammals, particularly around the Banks Lake area. Bird species and habitat identified by the WDFW in these areas include sage grouse, Ferruginous hawk, American white pelican, bald eagle, sandhill crane, western grebe, and a variety of shorebird and waterfowl concentrations. Mule deer is the most common large mammal, with portions of the City and its UGA providing habitat.

Priority habitats in and near Electric City include cliffs and bluffs, riparian areas, shrub-steppe habitat, and wetlands. These habitats serve a variety of

functions in and near Electric City for locally protected species. These habitats are largely affected by various anthropogenic activities including agricultural practices and development. A decline in these locally important habitats can also affect the species that rely on them.

Most of the habitat conservation areas in and near Electric City are associated with Banks Lake. Banks Lake is a 27-mile manmade irrigation impoundment that receives water directly from Lake Roosevelt via pumping and serves as the irrigation equalizing reservoir for the Columbia Basin Project. Banks Lake supports nongame, warmwater, and coldwater game fish and a valuable, year-round sport fishery for kokanee, smallmouth bass, walleye, and other species. The WDFW supplements the kokanee population with hatchery fry plants, and also plants rainbow trout through a cooperative agreement with the local community. The area surrounding Banks Lake also provides habitat for birds and large mammals.

As the conversion of untouched land to agriculture and development continues, habitat fragmentation will further reduce biological productivity and diversity. Conservation areas, such as public holdings, hold promise for successfully protecting eastern Washington's natural wildlife heritage. Outside of the City limits, the acreage and benefits of these conservation areas may be improved by lands protected and enhanced through programs carried out by Grant County and the Grant County Conservation District. Future considerations for Electric City include:

- Conserving existing public or private lands, as appropriate, for habitat purposes, augmented where needed by additional purchases, exchanges, conservation easements to "connect" large tracts of habitat (e.g., wetlands, shrub-steppe) into functional systems
- Applying and monitoring for effectiveness of regulatory provisions to protect and enhance near-shore riverine and wetland environments
- Applying water conservation standards
- Encouraging land use practices that eliminate or significantly reduce non-point source pollution
- In concert with state resources agencies, undertake local educational outreach programs including grant monies for demonstration projects on private lands associated with sensitive resource issues

The following references are available for determining the general location and extent of fish and wildlife habitat conservation areas:

- National Oceanographic and Atmospheric Administration Fisheries Service Critical Habitat (<http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm>)
- U.S. Fish and Wildlife Service Environmental Conservation Online System (<https://ecos.fws.gov/ecp/report/table/critical-habitat.html>)
- U.S. Fish and Wildlife Service National Wetlands Inventory (<https://www.fws.gov/wetlands/>)
- WDFW Priority Habitats and Species Interactive Mapping (<http://wdfw.wa.gov/mapping/phs/>)
- WDFW SalmonScape (<http://apps.wdfw.wa.gov/salmonscape/>)
- DNR Natural Heritage Program (<https://www.dnr.wa.gov/natural-heritage-program>)
- Grant County Conservation District webpage (<http://www.columbiabasin cds.org/>)
- Grant County Geographic Information System Maps (<http://www.grantcountywa.gov/GIS/>)

1. Classification

Electric City is generally considered an area where urban development is expected and planned to occur. Much of the urban growth area and substantial portions of the city remain undeveloped as a result of public ownership and lack of demand to support extension of utilities into unserved areas. While these natural areas include important habitat for animal and bird species, there are vast contiguous properties in the rural areas of Grant County. Therefore, it is not intended that the City limit development within the community or urban growth area. However, Banks Lake and associated riparian areas in the City and adjacent Urban Growth Area warrant protection. Following are descriptions of the City's classifications for fish and wildlife conservation areas:

Riparian Habitat Conservation Areas:

With this classification, the City recognizes that riparian habitat within Electric City and its urban growth area is likely to coincide with shoreline areas, wetlands and aquifer recharge areas. Riparian areas typically offer relatively contiguous habitat that is

essential to a diverse array of fish and wildlife species. Best Available Science seems to indicate that these areas are especially sensitive to pressures from urban development, and that they provide important habitat functions and values for anadromous fish.

Riparian Habitat Conservation Areas are defined as public or privately-owned lands adjacent to Banks Lake that presently contain riparian vegetation.

Upland Habitat Conservation Areas:

With this classification, the City recognizes that those upland areas within the defined City limits and urban growth boundary, which are not otherwise designated as aquifer recharge areas, wetlands, or geologically hazardous areas, are frequently the most suited for human development. This classification is intended to take into account that upland habitats that support federal or state identified endangered, threatened or sensitive species, or any habitats which are identified as providing a high level of functions and values must be protected to the extent possible. However, in considering Best Available Science, this classification also is intended to ensure that development is not subject to burdensome regulation in those areas most suited to support it. Such areas shall include all portions of the City and urban growth area where a development pattern is already established such that connectivity of native habitat has already been broken and protection of identified habitat areas is unlikely to provide particular benefit to any of the priority species identified by WDFW.

2. Designation:

Fish and wildlife conservation areas are designated under the Washington Department of Fish and Wildlife Priority Habitat and Species Program. Priority habitats are considered to be priorities for conservation and management. Priority species require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority Habitat and Species maps based on WDFW data depict habitat conservation areas (see CA IV Fish & Wildlife Habitat in the Map Appendix). However, it must be noted that populations and habitat systems are dynamic in nature. Therefore, site review should be used to verify the presence of a given habitat or species. Map 13-4 in the Map Appendix provides the location of areas designated as Fish & Wildlife Habitat.

Cultural Resource Areas:

Cultural resources are identified in the Electric City CAO as those areas that have been identified as having lands, sites, and structures that have historical or archaeological significance. Native Americans, like the many bands of the Colville Confederated Tribes, Columbia and Wanapum people, have traveled over the

landscape that is now Electric City harvesting the roots and plants for food and medicine, taking shelter where the land suited them. Cultural resources include archaeological sites and objects, traditional cultural lands, food gathering areas, and burial grounds. Preservation of Electric City's cultural resources through records and other means of preservation is important to the City's past, current, and future residents.

Future development should be consistent with the local, state, and federal regulations for protection of cultural resources and archaeological sites. The Electric City CAO provides maps and references for identifying archaeological sites and potential cultural resources areas. Additionally, site assessment requirements and protection standards are provided for future development. Where archaeological sites or cultural resources are identified, development should be coordinated with the tribes to avoid, minimize, or mitigate for potential impacts.

In addition to the Electric City CAO (16.10 ECMC), the following resources are available for determining the potential for encountering archaeological sites or cultural resources:

- Washington State Department of Archaeology and Historic Preservation Washington Information System for Architectural and Archaeological Records Data (<https://dahp.wa.gov/project-review/wisaard-system>)
- Grant County PUD Artifact Protection webpage (<http://www.gcpud.org/environment/artifactprotection>)

Shoreline Management Act

Enactment of the Shoreline Management Act in 1971 (RCW 90.58) reflected a growing concern among the residents of Washington State with the adverse effects of unplanned and uncoordinated development on the state's shorelines. The Shoreline Management Act establishes a cooperative program of shoreline management between local government and the state. Local government has the primary responsibility for initiating and administering the regulatory program for shoreline development. The state Department of Ecology acts primarily in a supportive and review capacity with primary emphasis on ensuring consistency between local policy and provisions of the Act.

In Electric City, Banks Lake is designated a "shoreline of statewide significance", and thus, the City is required to give priority to statewide objectives and goals enumerated in RCW 90.58.020. Electric City regulates its shorelines through a Shoreline Master Program (SMP) adopted in 2014. The main purpose in including a reference to the shorelines in this

section of the land use element is to provide a link between the comprehensive land use plan and shoreline master programs.