

4 Natural Resources Element

4.1 Introduction

This Chapter describes the physical and biological setting of the County, along with soils and agricultural, mineral and water resources. Critical resources-areas (Wetlands, Critical Aquifer Recharge areas, Frequently Flooded Areas, Geologically Hazardous Areas and Fish and Wildlife Habitat Conservation Areas) within the County are identified, including their "functions and values," and the current trends associated with regulatory and voluntary protections for these resources. This Chapter also presents Benton County's approach for the protection of critical resources.

4.2 Natural Setting of Benton County

The natural setting of Benton County typifies that of the larger Columbia Basin area. The County is located in southeastern Washington and encompasses approximately 1,715 square miles. The Columbia River borders the north, east, and south sides of the County and the Yakima River intersects the middle of the County, flowing from Prosser to its confluence with the Columbia River at Richland. The County contains portions of three Water Resource Inventory Areas (WRIAs), including the eastern portion of the Lower Yakima Watershed (WRIA 37), the Rock-Glade Watershed (WRIA 31), and the Alkali-Squilchuck Watershed (WRIA 40).

4.2.1 *Climate*

Benton County is located in the central part of the Columbia Basin, which is surrounded by the Cascade and Rocky mountain ranges to the west and east, respectively. These ranges have a pronounced effect on the region's climate, which is dry and arid. The growing season in the region is approximately 185 days from mid-April to mid-October, with high temperatures exceeding 90 °F during the summer months and as low as 6 °F or colder during the winter months. Mean annual precipitation in the area ranges from 5 to 10 inches, with mean annual precipitation levels ranging from 10 inches or greater in discrete areas in Horse Heaven and Rattlesnake Hills (see Appendix A: Map Folio, Figure 6 – Precipitation Map). Approximately 70 percent of the precipitation in the region occurs between November and April with intermittent thunderstorms and other precipitation events occurring between March and October. Winter season snowfall accumulation ranges between 4 to 21 inches during the winter months, with snow melt and/or river icing during the winter and spring seasons occasionally causing flooding of the Yakima River.

4.2.2 *Topography*

The topography of Benton County is characterized by basin and valley lowlands, separated by the upland plateaus and ridges of the Yakima Folds Belt. The landscape is the product of seismic upheavals, volcanic eruptions, magmatic flows, glacial epochs, and cataclysmic floods. The legacy of

this history is the present geologic landscape that includes the Hanford area, productive soils on the flanks of anticlinal ridges, the Horse Heaven plateau, Rattlesnake Hills, Saddle Mountain, water resources of three major rivers, and the basaltic vertical columns and outcrops.

A thin layer of biology has adapted to the area's geologic base. The layer is relatively sparse and fragile on the dry uplands of shrub-steppe and bunch grasses, but diverse and resilient along reaches of rivers, tributaries, and creeks that flow throughout the County. From north to south, the major topographic features of Benton County are as follows:

Pasco Basin. A basal plane that comprises most of what is now the Hanford Site. Topography is flat to hilly, with elevations ranging from around 300 feet in the east to nearly 1,000 feet at the base of Rattlesnake Mountain.

Rattlesnake Hills. This segment of the Yakima Folds separates the Pasco Basin from the Yakima Valley. The ridge extends in a southeasterly-northwesterly alignment from its beginning in eastern Yakima County to a point where it merges with the Horse Heaven Hills south of Finley. Rattlesnake Ridge is discontinuous through the middle of the County where it has been perforated by the Yakima River (resulting in Red, Candy, and Badger mountains) and contains Rattlesnake Mountain, the highest unforested "peak" in Washington State. At 3,629 feet, Rattlesnake Mountain is also the highest point in Benton County.

Yakima River. The river bisects the County into north and south portions and is responsible for much of the varied topography of central Benton County. The river has been cutting the valley sediments in this syncline that separates Rattlesnake Ridge from the Horse Heaven Hills for tens of thousands of years. The present valley floor ranges from about 300 feet above sea level, at its confluence with the Columbia River at the City of Richland, to around 700 feet at the Yakima County line.

Horse Heaven Hills. This plateau constitutes the southern half of Benton County. The elevations of the Horse Heaven Hills rise from the County's low point of 265 feet near Crow Butte to 1,600 to 2,200 feet along the ridgeline which overlooks the Yakima Valley and the Badger Coulee. The Horse Heaven Hills are unique among the Yakima Folds: it is the southern-most and longest running ridge in the system at some 60 miles; it is the most severely "lop-sided" of the ridges, becoming more of a monocline than an anticline in areas; and it takes a definitive, 90 degree turn to the south at Kiona, which is the geographic center of the County. The ridgeline is highest at Jump Off Joe Butte south of Kennewick, and the plateau slides southward toward the Columbia River.



Horse Heaven Hills

4.3 Soils and Agricultural Resources

Benton County has highly productive agricultural soils with over \$9500 million generated by Benton County crops and livestock per year (~~BERK Consulting 2017~~[BentonFranklinTrends.org 2022](#)). Designated agricultural resource lands make up a majority of the County. (See Appendix A: Map Folio, Figure 4 and 5 for existing and proposed Land Use Designations Maps and Appendix L [Agricultural Resource Land Reclassification Memo](#).) The soils in Benton County are generally suitable for both agriculture and structural development, with localized constraints relating to slope, geohydrology, and pockets of sandy soils and fines. Soils in the region are very susceptible to wind and water erosion once stripped of their natural cover. However, in undisturbed condition, the indigenous shrub-steppe and bunch grass vegetative cover has adapted to hold basin soils in place. When stripped of natural cover, prevention of erosion requires the application of deliberate and aggressive management techniques.

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4.3.1 *Agricultural Soils*

Agricultural lands in Benton County are primarily used for dryland agriculture (487 percent), with the remaining areas used for irrigated agriculture (4037 percent) and rangelands (15 percent; ~~BERK Consulting 2017~~[AC Geo 2025](#)). The primary crop ~~grown by acreage~~ in Benton County is dryland wheat and wheat fallow (~~BERK Consulting 2017~~[AC Geo 2025](#)), which is generally planted higher-quality soils with sufficient natural precipitation. High-value irrigated crops such as vegetables, potatoes, and grapes are often grown on soils that require more management or receive lower rainfall, but have available water supplies. Generally, but with some notable localized exceptions, the addition of water and fertilizer to soils in Benton County will result in productive agriculture. The principal exceptions are on steep erosive slopes, in pockets of very sandy soils, or where near surface basalt formations are accompanied by thin soils and poor hydrologic conditions.

Agricultural lands of long-term commercial significance are located throughout Benton County. These lands are characterized in RCW 36.70A.030(10) as land that “includes the growing capacity, productivity, and soil composition of the land for long-term commercial production, in consideration with the land’s proximity to population areas, and the possibility of more intense uses of the lands.” As described in Appendix L, these lands are determined by assessing a variety of factors including, but not limited to, classification of prime and unique farmland soils, proximity to urban areas, proximity to markets, and other factors. Areas containing soils of long-term commercial significance are described in more detail in Section 3: Land Use Element. Appendix A: Map Folio, Figure 7 – General Soils Map provides a generalized depiction of the soils types and their locations within Benton County. Figure 9 in Appendix L shows lands having a Prime Farmland designation, including farmland of statewide importance, farmland of unique importance, and prime farmland if irrigated.

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Shrub-steppe and agricultural land

4.3.2 Soil Construction Limitations

Development in Benton County is generally not constrained by soil types, with few exceptions. For the purposes of structural development, soil limitations and development in geologically hazardous areas are addressed in the County's CAO (BCC Title 15). The ordinance requires that developments avoid or maintain setbacks from potentially unstable areas or adequately assess the degree of instability and locate, design, and engineer the development to address the level of hazard.

Soil ratings developed by the Natural Resources Conservation Service are used to indicate the potential degree of limitations for different types of development on different soil types. For example, a soil type might be rated as having slight, moderate, or severe limitations for the development of roads or dwellings. A variety of criteria are used in making such determinations, including such factors as depth to bedrock, shrink-swell potential, permeability, and slope.

It should be noted that even a "severe" rating does not preclude construction from occurring. Rather, it means that the potential limitation should be recognized and that the construction techniques employed may have to take the special soil conditions into consideration. In all cases, Natural Resources Conservation Service emphasizes that an on-site inspection or soil survey would be necessary before it can be determined for certain if such soil characteristics are present.

4.3.3 *Current Trends*

Agricultural production is expected to continue to be a major activity and to play a vital role in the Benton County and Washington State economies. Population growth in the region will require proper management of soils and agricultural resources to protect them from development-induced erosion, contamination, and other impacts.

4.3.4 *Future Considerations*

Benton County currently requires a 150-foot setback for residential dwellings from agricultural districts to protect agricultural lands of long-term commercial significance and to avoid future land use conflicts. Because of their importance to the local and state economy, agricultural lands of long-term commercial significance should continue to be protected from future development. Additionally, the implementation of the VSP, a new, non-regulatory, incentive-based approach that balances the protection of critical areas on agricultural lands, while promoting agricultural viability, will encourage conservation practices such as erosion control measures that will protect and enhance agricultural soils.

4.4 Mineral Resources

4.4.1 *Existing Conditions*

In Benton County, mineral resources are aggregates (i.e., sand and gravel deposits and crushed quarry rock). Mineral resource areas in Benton County include lands with commercially viable mineral resource deposits. Most of the mineral resource areas in Benton County are located along the Columbia and Yakima rivers. Mineral resource lands are required to be protected under provisions of GMA. Constraints for the extraction of these resources typically include incompatible land uses (e.g., residential or commercial) on adjacent lands or biologically sensitive areas.

The major use of aggregate resources is for urban and rural residential developments. Construction of both dwellings and road networks consumes substantial amounts of sand and gravel as well as quarried and crushed basalt, which is used in local landscaping. The Mineral Resource lands scattered throughout the County represent an important economic opportunity because sourcing these materials locally is more cost effective than importing them from other regions.

At the Hanford site, active borrow pits provide mineral resources used for remediation, restoration, and closure activities (DOE 2015). State law requires that such mineral resources of long-term commercial significance be protected from having their future exploitation affected by adjacent developments that may be incompatible with the mining and processing activities associated with these resources on the site.

4.4.2 *Current Trends*

Mineral resources in Benton County will continue to be responsibly extracted from commercially viable sites to support local business and development. Mineral resources at the Hanford site will continue to be used to support ongoing remediation, restoration, and closure activities. [Based on DNR data, Benton County has 26 active permits for surface mining of aggregate resources, including rock, stone, sand, and gravel. These resources supply the concrete, asphalt, and construction industries, as well as the public transportation sector, including WSDOT and Benton County Public Works.](#)

4.4.3 Future Considerations

The principal considerations for the future use of these resources are: i) the identification of additional sites; and ii) providing the owners of known commercially viable sites the opportunity to apply the provisions of the County's Mineral Resources Protection Ordinance in BCC Title 15 to the sites. Such protection can prevent the sites from having their future exploitation compromised by the location of incompatible land uses on adjacent lands. Mineral resource extraction on the Hanford Site will follow the U.S. Department of Energy *Draft Hanford Industrial Mineral Resource Management Plan* (2001). [DNR is completing additional mapping of statewide aggregate resources to provide more detailed information on the extent of resources, but the data is not yet available for Benton County. This information will be incorporated into Mineral Resource Lands designations as available.](#)

4.5 Water Resources

4.5.1 *Introduction*

Benton County includes portions of three major WRIs: Rock-Glade Watershed (WRIA 31), Lower Yakima Watershed (WRIA 37), and Alkali-Squillchuck Watershed (WRIA 40). Water resources are a key component to maintaining a vibrant and growing county. As with much of the West, water in Benton County serves competing, and at times, conflicting uses. Securing certainty in the water supply is a major issue for the County for the foreseeable future. See Appendix A: Map Folio, Figure 8 – Water Resources Map.

Water is one of Benton County's most valuable natural resources. Reliable access to surface and ground water is necessary for household uses, irrigated agriculture, recreation, commercial and

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industrial development, and for fish and wildlife. Today, irrigated agriculture is the biggest user of water in the County, with supplies coming from the Columbia and Yakima rivers as well as from groundwater. The County's water resources also provide benefits for the natural environment and aesthetic amenities that contribute to the ambiance and lifestyle of the area. Water is a limited resource under numerous competing and changing demands, but improved management of the water resource system will allow for managed growth.



Irrigated agriculture in Benton County
Source: Washington State Department of Ecology

4.5.2 Existing Conditions

4.5.2.1 Surface Water

Benton County is located where the Snake and Yakima rivers flow into the Columbia River. Vast quantities of water, approximately 191,000 cubic feet per second or over 100 billion gallons each day, flow past Benton County on the way to the Pacific Ocean. This river system serves multiple uses, including power generation, fisheries, endangered species habitat, agriculture, and recreation. The system is culturally relevant for and connected to native and non-native Americans of the Pacific Northwest. The purpose of the following policies, however, is to focus on the needs of Benton County residents specifically.

Within the County, approximately 330 miles of shorelines meet the jurisdiction criteria of the Benton County SMP. The total acreage of upland shoreline area regulated by the SMP is approximately 15 square miles (The Watershed Company and BERK Consulting 2012). Critical areas within shoreline jurisdictions are also protected under the Benton County SMP (Appendix F).

The Columbia and Yakima rivers and their tributaries and creeks are the most prominent water resources within Benton County. Both rivers are classified as Shorelines of Statewide Significance by Washington State. The Columbia and Yakima rivers are directly related to critical area functions

throughout the County as a water source for critical aquifer recharge areas and provide floodplain, wetland, and fish and wildlife habitat. Within the central Columbia Basin's desert environment, it is estimated that up to 75 percent of indigenous wildlife species depend upon these riverine corridors for cover and other sustenance essential to their lifecycles.

A major overriding issue for both the Columbia and Yakima rivers is the survival of salmon and steelhead. The principal impacts to salmonids are:

- Water quality and habitat conditions within watersheds and estuaries
- Passage conditions and predation concerns at diversion dams
- Hydroelectric dams and pools on the Columbia which have an impact on out-migrating smolt mortality
- Fishing pressures in the ocean as well as the local river system

Pressures on salmon and other aquatic species may be further exacerbated as increased variation in both ocean and freshwater hydrologic conditions occurs from changes in climactic conditions.

Several anadromous species within the river system are listed as threatened, endangered, or candidates under the federal Endangered Species Act. Recovery efforts are ongoing to help reverse these trends, with many projects being implemented in both the Yakima and Columbia rivers to help improve passage, flow, and habitat conditions.

4.5.2.1.1 *Columbia River*



Columbia River
Source: Washington State Department of Ecology

The Columbia River bounds the north, east, and south sides of Benton County, flowing through the Alkali-Squilchuck and Rock-Glade watersheds. Besides the Yakima River, tributaries within the County are primarily small, ephemeral streams that flow through confined canyons. In the mid-Columbia region, the Columbia River hydrology is regulated by dams, with the highest flows occurring between April and June. The McNary Dam, located along the County's southern boundary, is operated by the U.S. Army Corps

of Engineers for navigation, hydroelectric power generation, recreation, and irrigation (The Watershed Company and BERK Consulting 2012).

4.5.2.1.2 Yakima River

The Yakima River within the County flows east to west from the City of Prosser to its confluence with the Columbia River located on the southeast side of the City of Richland. Most of the streams within the Yakima River watershed originate at elevations where annual precipitation is higher. Five major reservoirs and one smaller reservoir (Clear Creek) operated by the U.S. Bureau of Reclamation are located upstream of Benton County in the upper Yakima and Naches watersheds. These reservoirs contribute to recent higher summer flows in the Yakima River compared to historical conditions, particularly in the upper Yakima. Lower Yakima flows are often lower in the summer than historical conditions, primarily due to irrigation diversions. Backwater effects from the McNary Dam on the Columbia River limit channel migration on the Yakima River within Benton County (The Watershed Company and BERK Consulting 2012).

The current condition of the Yakima River, especially in its lower reaches in Benton County, is degraded and poor due to high ambient air temperatures, lower summer flows, non-point source pollution, and areas of higher water temperatures, all of which are functionally related. This condition jeopardizes both the native and anadromous fisheries, it threatens the long-term survival of the agricultural economy, reduces recreational opportunities, may lower real estate values of river front property, and limits the utility of the river for municipal and industrial uses.

4.5.2.2 Groundwater

Benton County is located in the central portion of the Columbia River flood basalt area, which includes basalt flow layers such as the Saddle Mountain, Wanapum, and Grande Ronde basalt layers (EA West 2017). The Columbia River basalts of the Columbia Plateau provide a locally important aquifer system, along with the unconfined, alluvial aquifers primarily along rivers and streams in the County, but also in sediments on top of the upper basalt layers. Groundwater production occurs in the sediments and the upper and lower basalt layers, which can often extend several hundred feet below ground.

Today, the reduction in flood frequency and floodplain connectivity resulting from reservoir management and diversion of irrigation water has altered the timing and character of streamflow and groundwater recharge through the Yakima watershed (The Watershed Company and BERK Consulting 2012). Additionally, nitrate groundwater contamination is a documented public health issue in Benton County (EA West 2017). The potential contaminant sources and pathways on the County's groundwater supply have not historically been well characterized nor have their effects been fully understood. As a result, the Benton Conservation District has developed the *Benton County Groundwater Nitrate Monitoring Study* "to help develop an essential foundation for groundwater quality restoration in Benton County with regard to elevated nitrates" (Benton Conservation District 2015). This study was followed up with the 2017 *Groundwater Nitrate Characterization Report* (EA West), which includes a description of geology, hydrogeology, and

elevated nitrate risk areas throughout Benton County, along with potential sources and suggested management and mitigation actions. [Finally, this work led to the development and adoption of a Benton County Groundwater Nitrate Community Action Plan in 2018. This action plan includes the current understanding of the nature of the groundwater nitrate problem and sources that may contribute nitrate to groundwater in Benton County, recommended management strategies, and a process to implement the strategies and monitor their progress. The Action Plan contains specific goals used to guide the implementation of nitrate management strategies \(Benton CD 2018\).](#)

4.5.3 Current Trends

4.5.3.1 Surface Water

Current trends regarding protection of rivers and creeks continue to improve. Regulatory requirements such as the GMA, Shoreline Management Act, and federal and state water quality laws require protection of these resources. Problems are recognized as essentially "watershed-wide," cumulative, and more complex than can be dealt with by the State unilaterally, or by individual jurisdictions, even if they "coordinate" efforts. Efforts continue both for the Columbia and Yakima river basins to address water management to meet in and out of stream needs and manage hydropower operation. The Columbia River Treaty renegotiations may further modify operations on the Columbia River, and this could impact river uses and how flow is managed for fisheries and out of stream water uses. Additionally, climatic variation could affect the levels of snowpack in the upper Columbia River and, in particular, in the lower elevation mountains of the Yakima River, and the associated timing of runoff, further potentially impacting the amount of water available for fish, farms and cities in the spring and summer months, and existing and future drought resiliency.

~~What is r~~Required in the Yakima River Basin is an integrated plan covering all aspects of water and land use that potentially impact water quantity and quality. In 2013, the U.S. Bureau of Reclamation signed a Record of Decision for the Yakima Integrated Plan, a 30-year, \$3.8 billion program to restore the Yakima River System and accommodate agricultural, municipal, and domestic needs (USBR 2013). The Yakima River Basin occupies portions of Benton, Kittitas, Klickitat, and Yakima counties. Since that time, state and federal funding has been obtained to implement several projects to improve conditions within the Yakima River Basin under the Yakima Integrated Plan.

4.5.3.2 Groundwater

Regionally, the trend is one of declining ground water levels in lower aquifers and declining water quality in both the upper and some of the lower aquifers. This regional phenomenon is largely attributed to expansions in the amount of acreage under irrigated agricultural production, along with other anthropogenic factors. Specific areas are identified and evaluated in the 2017 study by EA West on groundwater conditions in Benton County [and the associated Groundwater Nitrate Community Action Plan \(Benton CD 2018\).](#)

4.5.4 Future Considerations and Water Resource Management

The protection and management of water resources is expected to continue under the County's CAO, SMP, and the VSP, along with regional management plans including the Yakima Integrated Plan and ~~various~~ salmon recovery plans. Implementation of watershed-level management programs such as the Yakima Integrated Plan and the Rural Water Supply Proram will help to address water supply issues in the ~~region~~lower Yakima, particularly during drought conditions, and improve flows and habitat conditions for fish.

The purpose of the water resource guiding principles, goals, and policies in this Comprehensive Plan are to guide Benton County as it interacts with the federal government, Washington State, external local government agencies, and residents throughout Benton County. The principles and policies herein will provide a guide for Benton County elected officials and staff in addressing water and water-related responsibilities and issues affecting Benton County.

It is the intent of Benton County to protect the quantity and quality of water resources for the many uses that make Benton County a desirable place to live, now and in the future.

4.5.4.1 Guiding Principles

Following are the guiding principles and beliefs the County will consider in addressing water resource issues:

1. Support and promote sustainable water resource management. Sustainable water resource management will allow for the preservation of current economies, population growth with improved quality of life, and future economic expansion and diversification, all while protecting the quality and quantity of water necessary to support and enhance native fish and wildlife.
2. Use water resources to promote economic and social well-being in concert with reasonable environmental objectives. There must exist a realistic balance among water use benefits and economic costs.
3. Focus on improving water resource management at all jurisdictional levels by supporting the efforts of municipal and special purpose governments within Benton County and a legislative agenda at the federal and state level. Though limited in some geographical areas, water resources physically exist within most areas in Benton County to meet current and future needs. Effective water management and innovative strategies are required to allow beneficial use of these water resources.
4. Intervene in state and federal decision-making processes as required to promote the best interests of the citizens of Benton County. This intervention may include policy, planning, administrative, and legal processes.

5. Support sustainable water resource management in rural and municipal areas and take a leadership role in unincorporated areas. Work with municipalities to develop joint standards in unincorporated UGAs.
6. Maintain policies that support the belief that a water right is a property right.
7. Develop county regulations and policies in full consultation with local governments that support federal and state regulations where they meet the needs of the local population and municipalities.
8. Support securing long-term, sustainable water supplies sufficient to realize the build out of the land uses designated in the Comprehensive Plan as well as the Hanford Comprehensive Land Use Plan.
9. Maintain good working relationships with water users upstream and downstream from Benton County.

4.5.5 *Focus on the Yakima River Basin*

4.5.5.1 Yakima River Basin Water Rights

A large portion of the Benton County irrigated agriculture within the Yakima River Basin, including both the Kennewick (KID) and Roza (Roza) irrigation districts, receives irrigation surface water through the U.S. Bureau of Reclamation's Yakima Project. Roza and KID have 1905 water rights that are junior and subject to pro-rationing in droughts and other low water years. In years of drought these supplies are curtailed to an amount that is based upon total water supply available. Roza only received 47 percent of its supply in the 2015 drought, and KID also had a reduced supply. [Additional droughts have occurred in recent years, also reducing water supplies at various levels.](#) These reduced supplies can have significant impacts on crops and the regional economy.

The Yakima River Basin has been involved in a water rights adjudication process for more than 40 years. The adjudication and other state and federal court decisions have determined that water supply in the Yakima River Basin is over appropriated. Ecology settled with the U.S. Bureau of Reclamation and the Yakama Nation in the late 1990s over proposed groundwater permits in the Blackrock area and Rattlesnake Ridge. In September 2011, the U. S. Geological Survey released the final report of a 12-year, multi-million-dollar study confirming that some groundwater and surface water are directly connected, which means some groundwater withdrawals have the potential to impair senior surface water rights.

Ecology, in cooperation with the U.S. Bureau of Reclamation and the Yakama Nation, has determined that groundwater management in some areas may need to occur in order to protect senior water rights, flows for fish, and economic development. Ecology has stated they will seek solutions that address uncertainty and exposure faced by existing post-1905 groundwater users. In seeking water

management solutions, Ecology will build upon the broad-based support for the Yakima Integrated Plan (Ecology 2017).

4.5.5.2 Yakima River Basin Integrated Water Resource Management Plan

The Yakima Integrated Plan (Ecology and USBR ~~2014~~2013) was developed by a diverse Work Group made up of tribal, federal, state, local, private, and nonprofit entities to address a variety of water resource and ecosystem problems affecting fish passage and habitat and agricultural, municipal, and domestic water supplies. The Yakima Integrated Plan provides a balanced approach to address water shortages through increased water storage, enhanced water conservation, water marketing, and better use of existing infrastructure. The Yakima Integrated Plan also improves the overall ecological integrity of the Yakima River Basin by protecting and enhancing riparian and headwaters habitat, providing fish passage at reservoirs, and making targeted land acquisitions on a willing-seller basis.

The Yakima Integrated Plan includes seven elements: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation. Benton County supports the seven elements of the Yakima Integrated Plan and efforts by Kennewick Irrigation District and Roza Irrigation District to secure water supply during drought conditions to reduce drought impacts. The County supports other efforts in the Yakima River Basin and in the lower Yakima River to improve water supply, flow, and habitat conditions, including improving water quality.

4.5.5.3 Addressing Exempt Wells to Meet Long-term Growth Needs

The County recognizes the need for developing and implementing a long-term strategy for addressing permit exempt wells needed to support rural development consistent with State law (RCW 19.27.097, RCW 58.17.110, and others), meet the goals of the Comprehensive Plan and Yakima Integrated Plan, and ensure future domestic water supplies (see Section 3.7 for Population Projections) are both physically and legally available for water withdrawal.

Demand for water to serve the County's growing urban and rural areas is projected to significantly increase. Since surface waters within the Yakima River Basin are over appropriated, dependence on groundwater for domestic uses is likely to continue. To sustain growth, residents of Benton County must meet the ongoing challenge of protecting and managing our water resources.

It is understood that some surface and ground water in the Yakima River Basin are hydrologically connected. Rural domestic water supply is generally provided from groundwater sources (i.e., private wells). The withdrawal of water from groundwater sources hydrologically connected to surface water may have an adverse impact on senior water rights established before and including 1905.

4.5.5.3.1 Exempt Wells Legal Framework

RCW 90.44.050 provides for the supply of rural domestic water through the use of “exempt wells,” which can pump up to 5,000 gallons per day for residential use. The permit well exemption also allows pumping of 5,000 gallons per day for industrial use, 5,000 gallons per day for irrigation up to half an acre, and an unlimited amount for stock water purposes. Permit exempt groundwater withdrawals do not require a water right permit. However, to the extent the groundwater is beneficially used, the water user withdrawing groundwater under the exemption establishes a water right that enjoys the same privileges as a water right permit or certificate obtained directly from Ecology. Though such withdrawals are “permit exempt,” they are still subject to Washington State law regarding the seniority of water withdrawals. Water use of any sort is subject to the “first in time, first in right” clause, originally established in historical western water law and now part of Washington State law. This means that a senior right cannot be impaired by a junior right. Seniority is established by priority date—the date an application was filed for a permitted or certificated water right or the date that water was first put to beneficial use in the case of claims and exempt groundwater withdrawals. Although exempt groundwater withdrawals don’t require a water right permit, they are subject to state water law.

In some instances, Ecology has had to regulate, stop, or reduce groundwater withdrawals when they interfere with prior or “senior” water rights, including instream flow rules. Recent state court decisions on the requirements of the GMA and County land use plans have resulted in a duty for Benton County to ensure that water for development is legally and physically available.

Closure of the portions of the Yakima River Basin to exempt well construction has already occurred in Kittitas County, which in turn has had effects on the development patterns and a large effect on the value and marketability of legal lots which can now only be developed with the use of a mitigation program for exempt wells operated by Kittitas County. Benton and Yakima counties face similar risks. Benton County is committed to taking the necessary steps to secure future domestic water supply and associated mitigation for projected rural population growth.

4.5.5.4 ~~Developing a Yakima River Basin~~ Rural Water Supply Program

Benton County understands that groundwater withdrawal ~~may have~~has effects on Yakima River Basin senior water rights, including the Yakama Nation Water right for protecting fish. ~~Thus, the potential~~ ~~e~~Effects of future groundwater withdrawals within the Yakima drainage on senior water users and habitat conditions ~~will be~~are being addressed through the County’s Rural Water Supply program effective in 2020~~in the next several years by the County. The County will complete this work~~program was developed in coordination with Ecology, the Yakama Nation, the U.S. Bureau of Reclamation, and stakeholders in the County and Yakima River Basin.

The Benton County Rural Water Supply Program was established to provide mitigation for any new residential use within the Mitigation Area (a portion of the Lower Yakima Watershed known as WRIA 37, as shown on the official Benton County Mitigation Area Map) in the form of acquiring senior water rights in order to offset groundwater use and managing the metering of wells. To date the County has acquired 425 acre-feet of senior water rights for the Benton County Water Bank.

Applicants for a subdivision/short plat or a new- building permit for a new dwelling unit within the mitigation area are required to purchase a mitigation certificate for each proposed lot (of a subdivision/short plat) or building permit. Building permit applicants for a new dwelling unit must also purchase and install a meter for their residential well and report water use.

This work will include identifying mitigation strategies for providing water for rural development in the basin, while avoiding impacts to flows in mainstem reaches and the few Yakima River tributaries that exist in Benton County. The specific next steps planned for Benton County include:

1. ~~Confirming baseline groundwater conditions~~
2. ~~Developing future growth projections and water demands for future groundwater supply~~
3. ~~Developing mitigation strategies~~
4. ~~Formulating the County rural water supply program for areas that will be served through permit-exempt wells, including considering policy options and selecting elements for the establishment of the rural groundwater supply program in Benton County, to ensure water supply risks are mitigated for the next 20 to 50 years, and beyond if possible~~

~~The County will complete this work in coordination with Ecology, the Yakama Nation, the U.S. Bureau of Reclamation, and stakeholders in the County and Yakima River Basin.~~

4.5.6 *Columbia River*

The County will comply with the 2018 law passed by the Washington State Legislature addressing rural exempt well development for the portion of the County that drains to the Columbia River.

4.6 Critical Areas

Critical areas include ecosystems, landforms, or processes that are protected or enhanced under the GMA for the biological or physical functions and values that they provide. Critical areas are located throughout Benton County.

According to RCW 36.70A.030, the five critical areas protected by the GMA include:

- Wetlands
- Critical Aquifer Protection Areas
- Frequently Flooded Areas
- Geologically Hazardous Areas

- Fish and Wildlife Conservation Areas

Many critical areas provide habitat for species listed as threatened, endangered, sensitive, or candidates by the federal or state government. Figures 8 through 13 of Appendix A: Map Folio depict the general location of critical areas in Benton County. The key functions and values provided by the five critical areas in the County can be summarized into the following four major functions: 1) water quality; 2) hydrology; 3) soil; and 4) habitat. Each critical area provides one or more of these key functions and values, which are summarized in Table 4-1.

**Table 4-1
Critical Area Functions**

Critical Areas	Key Functions			
	Water Quality	Hydrology	Soil Health	Habitat
Wetlands	•	•		•
Critical Aquifer Recharge Areas	•	•		
Frequently Flooded Areas	•	•	•	•
Geologically Hazardous Areas (Erosion)	•	•	•	•
Fish and Wildlife Habitat Conservation Areas	•	•	•	•

The following includes a description, current trends, and future considerations for each of the critical areas. Section 4.6.6 includes additional information on the VSP and the intersection of critical areas with agricultural lands.

4.6.1 Wetlands

4.6.1.1 Existing Conditions

Wetlands in Benton County are concentrated within the floodplain of the Yakima and Columbia rivers. Similar to stream flows, irrigation drainage may contribute to wetland conditions in some areas where wetland conditions did not historically occur. Many wetlands have formed adjacent to irrigation conveyance systems and in low-lying areas where irrigation occurs (see Appendix A: Map Folio, Figure 9 – Wetlands, River, and Streams). A wetland is considered artificial, and not subject to state or local regulation as a wetland, only if it meets both of the following characteristics:

- Intentionally created
- Formerly non-wetland (upland) site

In irrigated agricultural areas, wetlands can result from localized conditions (e.g., a leaking irrigation ditch) or from a region-wide rise in groundwater resulting from regional irrigation projects. These types of wetlands are regulated by state wetland law and cannot be filled or drained without

appropriate permits and mitigation (Ecology 2010). However, if the irrigation practices that led to the incidental wetland creation are changed (for example through implementation of water conservation practices), and the wetland dries up and no longer performs wetland functions, then no mitigation is required (Ecology 2010).

4.6.1.2 Current Trends

The current regulatory trend is for the protection of wetlands as a resource vital to sustaining biological productivity and water quality.

Within Benton County, the most noticeable trend is the gradual loss of artificial wetlands resulting from water conservation projects by irrigation districts and more efficient irrigation practices by farmers. Though there is no clear evidence of it to date, if the result of these efforts is to leave more water in the rivers as instream flow, then the natural wetlands along the riverine corridor should benefit.

4.6.1.3 Future Considerations

By both policy and ordinance, the Comprehensive Plan protects natural wetlands from non-agricultural developments. It also protects previously unfarmed wetlands from new agriculture. It is expected that the database for wetlands within the County will be improved over time and that such resources will be protected consistent with the requirements of state law and local interest.

4.6.2 Critical Aquifer Recharge Areas

4.6.2.1 Existing Conditions

The Columbia River basalts of the Columbia Plateau provide a locally important aquifer system. Within the lower Yakima River Basin, from the western County border east to Horn Rapids, the mainstem channel of the river flows through a relatively narrow inner valley of basalt bedrock covered with an unknown thickness of coarse alluvium. Downstream from Horn Rapids, the river flows through the broad alluvial fill of the Columbia River.

Within Benton County, the majority of wells and wellhead protection areas (Appendix A: Map Folio, Figure 10 – Critical Aquifer Recharge Areas) are concentrated along the Yakima River Valley and in the incorporated cities of Richland and Kennewick. Other Group A water system wells are located near irrigated lands in the southern portion of the County near Paterson. Studies have found nitrate concentrations exceeding drinking water quality standards in shallow wells in eastern and southern Benton County (WSIGC 1996; Ecology 2016). Based on the number of wells and the percentage of wells exceeding 10 milligrams per liter of nitrate, Ecology identified eastern Benton County as one of the top ten nitrate priority area candidates for improved water management within Washington. Actions implemented under the VSP, along with other management measures can help to prevent further degradation and potentially improve conditions.

4.6.2.2 Current Trends

Nitrate contaminations occur principally in upper aquifer wells drilled in the lower lying areas of the County. The spatial correlation between elevated concentrations of nitrates in groundwater and irrigated lands indicates that the major source of contamination is applied fertilizers on irrigated lands including crops, lawns, golf courses, and parks.

A complicating factor in the nitrate picture is evidence that suggests currently seepage from irrigation district canals actually serves to dilute what would otherwise be higher nitrate levels within groundwater (USGS 1993). As federal and State sponsored conservation projects reduce or eliminate this seepage, nitrate concentrations in the upper aquifer may actually rise.

4.6.2.3 Future Considerations

The protection and management of critical aquifer recharge areas in and around Benton County should continue to reduce pollution and maintain water storage levels for future use.

Benton Conservation District is also leading efforts to improve groundwater conditions through additional management measures. The Conservation District has been collecting sampling data from approximately 200 groundwater wells throughout the County to identify the influence of potential nitrate sources or nitrate dilution sources, as well as seasonal fluctuations in nitrate levels (Benton Conservation District 2015). These efforts are helping the County to build a more effective and targeted management program, including ~~developing~~ ~~a~~ stakeholder group, ~~supporting~~ a public health campaign and outreach activities, and implementing groundwater quality improvement efforts countywide, as documented in a 2017 report (EA West) and described in Section 4.5: Water Resources.

4.6.3 Frequently Flooded Areas

4.6.3.1 Existing Conditions

There are several types of landforms in Benton County that are subject to flood hazards. Most notably, the low-lying lands along the Yakima River flood significantly under varying winter and spring conditions. However significant flooding and flood damage can occur off the river as well in the Yakima's tributary streams, "dry" canyons, and other natural drainage features throughout the County, which are susceptible to "flash floods" or heavy run-off from snow melt.

The entirety of the Yakima River is mapped as a floodplain and floodway. The floodplain of the Yakima River is widest downstream (east) of Benton City. Floodplains are also mapped along the Columbia River, particularly in the northwest corner of the County, along the southeast near Kennewick and Richland, and along the south side of the County. Designated floodplains are shown in **Appendix A: Map Folio, Figure 11 – Frequently Flooded Areas.**

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Flood areas pose constraints to development because construction within them can put both life and property at risk and require frequent and recurring expenditures of public and/or private funds for the repair of public and private property.

The most damaging floods in Benton County are associated with the Yakima River. This is because Benton County is the most downstream county in the entire Yakima River drainage, which contains 6,155 square miles, or four million acres, and the basin has limited flood control facilities. Annually, the snowpack on the east side of the Cascade Range melts and passes through Benton County within a river channel ("floodway") that is in some places less than 60 feet across. Depending upon the size of the snowpack, the rate and timing of its melt, and the ground conditions within the watershed, the lower Yakima River floodway may or may not be sufficient to carry the flow. When it is insufficient to carry the flow, water leaves the floodway and moves overland onto the floodplain.

If the snowpack melts gradually over the spring months the river channel may be full, but not flood. However, if a warm Chinook wind melts a portion of the snowpack in January, while the river and ground in Benton County are still frozen, the melt water will reach its ice clogged channel and leave the river to spread overland; or if warm temperatures come suddenly in early spring the entire watershed may thaw simultaneously and inundate the lower river valley.

The areas along the lower Yakima in Benton County are especially vulnerable to flooding annually and extend from Benton City downstream through West Richland to the delta where the Yakima empties into the Columbia River. This area is characterized by low-lying river bottom lands and ancient river channels which are historically the river's natural floodway and floodplain.

4.6.3.2 Flood Management

One of the products of the Federal Emergency Management Agency's (FEMA) flood insurance program has been the mapping of flood hazard areas throughout the nation. The primary area of concern in this effort has been the 1% annual chance floodplain (formerly known as the 100-year flood hazard area). The 1% annual chance floodplain has been adopted by FEMA and, by extension, the County as the base flood for purposes of floodplain management measures.

Encroachment on floodplains, such as placing artificial fill, reduces the flood-carrying capacity and increases flood heights, thus expanding the area susceptible to flooding and increasing flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1% annual chance floodplain is divided into a "floodway" and a "floodway fringe." The floodway is

the channel of a river, plus any adjacent floodplain areas that must be kept free of encroachment to carry the 1% annual chance floodplain without substantial increases in flood heights. As a minimum standard, the Federal Insurance Administration limits such increases in flood heights to one foot, provided that hazardous velocities are not produced.

The area between the floodway and the boundary of the 1% annual chance floodplain is termed the "floodway fringe." The floodway fringe thus encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1% annual chance floodplain more than one foot at any point.

4.6.3.3 Current Trends

The maximum known flood of the Yakima River occurred in December of 1933, with a depth of approximately 9.5 feet above the top of the riverbank at Benton City. Its estimated recurrence interval is approximately 170 years. Severe flooding of the Yakima River recently occurred in 1996, resulting in the largest and most devastating floods in recent history. More recently, flooding occurred in 2015 and 2017 in parts of Benton County. The likely trend is for the frequency and magnitude of floods within the lower reaches of the Yakima River to stabilize or even reduce as the upper watershed restores natural storage capacity through levee setbacks, watershed restoration, and other measures.

4.6.3.4 Future Considerations

Any new development located within the floodway will be reviewed by Benton County to meet current FEMA and BCC [Titles 3.26 \(Flood Damage Prevention\) and Title-15 \(Critical Areas Protection\) development standards/codes](#).

4.6.4 Geologically Hazardous Areas

4.6.4.1 Existing Conditions

Geologically hazardous areas encompass channel migration zones, steep slopes with moderate to severe erosion potential, landslide hazard areas, and seismic hazard areas. Channel migration in the Lower Yakima watershed is limited by a low gradient (average one percent gradient in the lower 47 miles of the river; BERK Consulting 2017) and geologic and structural controls in the eastern portion of Benton County. Similarly, the geology and topography of the Columbia River in Benton County, combined with dam regulations and shoreline stabilization measures, substantially limit channel migration.

Although the Department of Natural Resources identifies few landslide hazard areas within Benton County, steep slopes with erodible soils intersect agricultural areas along the northern face of the Horse Heaven Hills and eastern drainages within the Rock-Glade watershed, including along the Columbia River shoreline at Wallula Gap. Steep slopes with erodible soils are also mapped as

intersecting rangelands in the northwestern (Blackrock) portion of the County. See Appendix A: Map Folio, Figure 12 – Geologically Hazardous Areas for steep slopes and erosion hazard areas mapped within Benton County.

Steep sloped areas have the potential for mass movement and slope erosion hazards. Mass movement is the movement of rock or soil material down slope in response to gravity. Slope erosion is the removal of soil or weathered bedrock that occurs as a result of sheet wash (no conspicuous channels), rill erosion (numerous small rivulets), or gully erosion (larger, more nearly permanent channels).

Steeply sloped and unstable geologic structures pose a constraint to development because associated developments require more expensive design and engineering work. Additionally, a much greater land area per structure is necessary on steep slopes. Left in their undeveloped condition, the opportunities provided by these resources range from aesthetic (visual), to open space (for recreation), and, for basalt outcroppings and steep canyons, important habitats (nesting areas for birds of prey).

Slopes of fifty percent can be found in both the Rattlesnake and Horse Heaven Hills. Due to the unique problems inherent in developing steeply sloping areas, special care must be exercised in the planning and development of such areas.

4.6.4.2 Current Trends

As land use intensifies over the landscape with agriculture and residential developments competing for ground, and as higher income households target view lots on slopes and ridges, new residential developments will increasingly occupy the more geologically difficult terrain. These are the areas which present problems associated with geologic hazards.

4.6.4.3 Future Considerations

Future development should be consistent with the Benton County CAO in BCC Title 15.

4.6.5 Fish and Wildlife Conservation Areas

4.6.5.1 Existing Conditions

Due to the arid nature of Benton County, many streams classified by mapping as streams are dry washes that follow topographic lows and only transport water during large runoff events and therefore are not conducive to aquatic species habitat. Outside of irrigated areas, only streams modeled as greater than 7th order are likely to carry stream flow (even on an intermittent or ephemeral basis) and, in irrigated areas, streams that are greater



Shrub-steppe and riparian habitat

than 3rd order are likely to carry at least ephemeral flows (BERK Consulting 2017). Often the source of water for flow in streams in the County is from irrigation as many otherwise dry washes are used for irrigation water conveyance as part of an irrigation district system. Per RCW 36.70A.030(5), fish and wildlife habitat conservation areas do not include artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of and are maintained by a port district or an irrigation district or company. Field evaluation would still be necessary to verify stream occurrence at the site scale. Additionally, anadromous fish in Benton County use the Yakima and Columbia rivers to migrate, spawn, and rear. Anadromous salmon spawning is documented in some tributaries to the Yakima and Columbia rivers. See Appendix A: Map Folio, Figure 9 for a map of streams and rivers within the County.

Benton County contains protected habitats that are prioritized in various guidance and plans. WDFW's Priority Habitats and Species (PHS) Program provides key fish, wildlife, and habitat information to inform land use decisions. In addition to protecting individual habitat types, maintaining connectivity between habitats is important to sustaining ecological function. Habitat connectivity refers to the degree to which wildlife can move across the landscape to access food and shelter, migrate seasonally, establish new territories, and maintain healthy populations over time. Open space corridors that serve as biodiversity corridors and core habitat areas are mapped as PHS and play a critical role in maintaining ecological connectivity across the landscape. WDFW's Washington Habitat Connectivity Action Plan (WAHCAP) is a statewide strategy (currently in draft status) that guides habitat connectivity planning by mapping key wildlife corridors and identifying priority areas to reconnect important landscapes, including shrub-steppe habitats.

Shrub-steppe habitat is identified as a state priority and locally important habitat in the County, and consists of sagebrush, bunch grasses and forbs (broadleaf flowering plants). Shrub-steppe habitat was historically present throughout the County but agriculture and urban development has reduced much of this habitat. Large blocks remain on the Hanford Reservation and it is still extensive

Commented [GW62]: I think the CAO also calls it out a locally important species...

Commented [AC63]: Scott suggested using WDFW PHS definition in the shrubsteppe doc (although I like yours better): "A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs."
<https://wdfw.wa.gov/sites/default/files/publications/00165/wdfw00165.pdf>

throughout the County but each year additional development impacts this habitat. WDFW's Washington Habitat Connectivity Action Plan (WAHCAP) is a statewide strategy (currently in draft status) that guides habitat connectivity planning by mapping key wildlife corridors and identifying priority areas to reconnect important landscapes, including shrub-steppe habitats. The WDFW Washington Shrubsteppe Restoration and Resiliency Initiative (WSRRI) identifies core and corridor areas for shrubsteppe and other habitats. Shrub-steppe habitat and related WSSRI spatial priorities in the County are documented in Map Folio figure X and in an Open Space Corridors memorandum developed to support the 2026 Comprehensive Plan update (AC Geo 2025). The Blackrock area, which consists of a patchwork of private and publicly owned lands used predominantly for rangeland agricultural activities, is of significance for shrub-steppe habitat conservation. Additionally, State threatened ferruginous hawk is of importance on agricultural lands. See Appendix A: Map Folio, Figure 13 for mapped priority habitats within the County.

Several managed and protected fish and wildlife habitat areas are located in the County as described below:

Umatilla National Wildlife Refuge. The Umatilla National Wildlife Refuge is intensively managed to provide habitat for migratory birds and resident wildlife. Management practices include restoration of wetlands, manipulation of seasonal wetlands to encourage native food supplies, farming, prescribed burning, native planting in riparian areas, removal of exotic weed species, and planting native grasses in upland areas. Approximately 1,400 acres of refuge lands are irrigated croplands which provide food and cover for wildlife. Local farmers grow corn, wheat, alfalfa, and other crops under a cooperative agreement whereby the refuge's share of the crop is left in the field for wildlife.

McNary National Wildlife Refuge. Established in 1956, the McNary National Wildlife Refuge was created to replace wildlife habitat lost to construction of the McNary Dam downstream. The 15,000 acres of sloughs, ponds, streams, and islands include islands north of the City of Richland. Seasonal wetlands are managed to promote diverse wetland plant growth. Upland areas are managed with prescribed burning, removal of exotic weed species, and planting of native grasses. Native willows and cottonwoods are planted in riparian areas. Approximately 700 acres of refuge lands managed in agriculture specifically provide waterfowl with winter forage opportunities.

Barker Ranch. Barker Ranch is approximately 2,400 acres of alluvial and glacial floodway and floodplain with extensive riparian shoreline and wetlands that are a product of variously applied water, upwelling from subsurface hydrology, and seasonal river flooding. The ranch is located within the Yakima River migration zone primarily on the north side of the river extending up and down river from the Twin Bridges and the intersection of Snively and Twin Bridges roads. The north boundary is the Horn Rapids Ditch, the south boundary is the ordinary high-water line at the north side of the Yakima River. Today under the federal Wetland Reserve Program easement, approximately 1,865 acres of the ranch is under permanent conservation easement, with waterfowl and habitat

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Commented [GW64]: Should we mention shrub steppe mitigation program in this section?

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production the primary management objectives. Limited grazing continues under a grazing management plan that is wildlife and habitat driven rather than cattle driven.

Hanford Reach National Monument. In 2000, the Hanford Reach National Monument was established by Presidential Proclamation to protect, preserve, and expand critical shrub-steppe habitat and other cultural and biological resources. [The National Monument and the Hanford Reservation provide the largest intact and connected shrub-steppe habitat area in the County.](#)

4.6.5.2 Current Trends

The current trends relative to sustainability of fish and wildlife resources in Benton County is a mix of ~~success and failure~~ conditions. ~~On the successful side,~~ the Hanford site, occupying five percent of the County's land area is a large and functional habitat area of indigenous biological resources. Under federal ownership for the past 50 years, it has been left untouched by the far-reaching developments that have converted the off-site landscape. The shrub-steppe and wetlands complex of the Wahluke Slope to the north of the Columbia River and the U.S. Army's Yakima Training Facility to the west add hundreds of additional square miles of indigenous habitat, potentially "connectable" as a single unit.

Within the lower, flood prone reaches of the Yakima River, where private development is relatively sparse and large acreages are within local or federal ownership, a rich riverine environment of islands, wetlands, braided channels, and back water provide lush habitat and breeding and nursery areas for aquatic species.

Additionally, shore lands owned by the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service in the south of the County along the Columbia river's hydroelectric pools provide significant fish and wildlife resources.

In contrast, biological resources generally found outside of the Hanford Site experience pressure from development, farming, recreation, and other activities, ~~specifically, including~~ native shrub-steppe habitat ~~as discussed above that is being eliminated by the expansion of urban and agricultural developments.~~ [The County Voluntary Stewardship Program has measures to address preservation of shrubsteppe habitat and the County is also taking steps to develop a mitigation program for ongoing development, as discussed further below.](#)

Additionally, the Yakima River's anadromous and resident fisheries are threatened by ~~poor water quality due in large part to non-point source pollution combined with~~ low summer flows ~~and river habitat that is being increasingly dominated by aquatic vegetation such as stargrass.~~ Overall, outside of publicly held lands, the current regional and local trend further threatens biological resources and wet environments as habitat through development and land conversion, ~~including on Department of Natural Resources lands in eastern Washington.~~

The continuing loss of biological resources is evidenced by fragmentation of natural habitat, declining water quality, and the growing number of terrestrial and aquatic species listed as candidate, threatened, and endangered by the federal and state governments.

Within the larger watershed, there are also sub-trends. For example, there are projects that continue to be implemented each year for the conservation of surface water resources by irrigation districts under federal and state sponsored water conservation projects. The typical project is the lining or piping of antiquated irrigation water delivery infrastructure to reduce leakage loss. Additional programs seek to reduce the total of "applied" water. The impact of these These programs have is likely to be improved flow and water quality in river mainstems and tributaries, while eliminating some of the significant acreage of wetlands created by conveyed or applied water run-off. Other areas have seen new wetland and riparian habitat emerge from additional irrigated agricultural development in the County (often converted from prior grazed land), particularly in the southern portion of the County.

4.6.5.3 Future Considerations

As the trend to convert raw land continues, fragmentation of natural habitats will further reduce biological productivity and diversity. Remaining productive terrestrial and aquatic habitats will be confined largely to floodways and floodplains, canyons, undevelopable terrain, undeveloped areas designated "Rural" on the Land Use Plan Map, and on lands in government ownership (other than Washington Department of Natural Resources).

Maintaining public holdings and encouraging conservation easements on larger private land holdings, because of their size and uncomplicated ownerships, holds promise for successfully protecting eastern Washington's Benton County's remaining natural wildlife heritage. The acreage of these holdings may be augmented by additional private lands protected and enhanced through the VSP and other programs.

Actions for protecting habitats on public lands should be pursued under a federal, state, and local partnership, with non-impactive recreational uses a goal secondary to wildlife protection:

- Conserve suitable acreages of existing public lands for habitat purposes, augmented where needed by additional purchases, exchanges, conservation easements to "connect" large tracts of habitat into functional systems. Additionally, the County is using the 2026 update to develop and establish a shrub-steppe mitigation program (see Appendix X?) that seeks to preserve high quality habitat areas within the County that can help offset impacts to shrub-steppe habitat being lost through development through a common framework that all the cities and County can utilize. Benton CD is an important partner to the County and cities in implementing this program. WDFW has provided technical information and guidance during program development.

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- Apply and monitor for effectiveness regulatory provisions to protect and enhance near-shore riverine and wetland environments.
- Apply water conservation standards to non-farm developments.
- Increase upper watershed storage capacity to provide additional low season flows and reduce the competition between in- and out-of-stream uses for available water supplies.
- Encourage 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.

4.6.6 Voluntary Stewardship Program

In 2011, the Legislature amended the GMA with the intent to protect and/or voluntarily enhance critical areas in places where agricultural activities are conducted, while maintaining and improving the long-term viability of agriculture. This amendment established the VSP, a new, non-regulatory, and incentive-based approach that balances the protection of critical areas on agricultural lands, while promoting agricultural viability, as an alternative to managing agricultural activities in the County under the Critical Areas and Resources Protection Ordinance.



- Cattle grazing below shrub-steppe and cliffs and bluff habitat

Agricultural lands mostly have small intersections with critical areas in Benton County. Frequently flooded areas, geologically hazardous areas, and wetlands all have less than a 2 percent intersection with agricultural lands. Most critical aquifer recharge areas have small intersects with agricultural areas (less than 2.5 percent of agricultural lands); only areas with alluvial parent material or hydrologic soil group A have a moderate intersect (12.7 percent of agricultural lands). Fish and wildlife habitat conservation areas have the largest intersect (22.1 percent of agricultural lands). The Benton County VSP Work Plan (draft) provides additional information regarding the intersect of agricultural lands with critical areas (BERK Consulting 2017).

4.6.6.1 Future Considerations for Critical Areas Under the Voluntary Stewardship Program

Critical areas goals and protection benchmarks are included in the VSP Work Plan as measures that may be taken by agricultural producers to protect and/or enhance critical areas functions and values through voluntary, incentive-based measures. The plan is currently under development and the draft

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<https://www.vsp.wa.gov/county/benton>

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goals and protection benchmarks are provided as future considerations for each of the critical areas below. These goals and protection benchmarks may be updated as the Work Plan is finalized with the Work Group in coordination with Benton County.

- Wetlands
 - Manage runoff and erosion associated with agricultural activities through voluntary maintenance of conservation practices.
 - Maintain riparian vegetation to support biofiltration and bank stability in areas of agricultural intersect through voluntary practices, including managing livestock access to streams and wetlands.
 - Manage invasive species in and around wetlands, and maintain native species diversity.
 - Encourage voluntary enhancement of surface water quality in streams, wetlands, and agricultural drains in hydrologic study areas.
- Critical Aquifer Recharge Areas
 - Protect groundwater recharge in areas of declining water tables or where recharge can help maintain base flows for rivers and streams.
 - Maintain practices that limit leaching of nitrogen and other contaminants into groundwater.
 - Encourage implementation of groundwater recharge by passive infiltration or direct injection.
 - Promote voluntary on-farm water conservation practices, such as irrigation water management and efficient irrigation systems in areas with agricultural wells.
 - Promote voluntary conservation practices that minimize leaching of nitrogen and other contaminants into groundwater.
- Frequently Flooded Areas
 - Maintain floodplain connectivity in areas of agricultural intersect.
 - Maintain or reduce hazards to physical safety associated with flooding. New agriculture in floodplains should not require alterations that diminish floodplain functions or increase safety risks.
- Geologically Hazardous Areas
 - Maintain integrity of steep slopes in areas of agricultural intersect through the following:
 - Avoid increases in erosion
 - Avoid steep slopes or help to stabilize steep slopes where practical
 - Avoid irrigating unstable slopes
- Fish and Wildlife Conservation Areas
 - Maintain shrub-steppe habitat through voluntary management and protection measures, examples include, but are not limited to the following:
 - Timed/less intense grazing at appropriate times

- Native vegetation propagation
- Advanced fire protection strategies, including managed grazing and maintaining firebreaks
- Voluntary protection of set-asides (e.g., easements, acquisition, federal conservation programs, and other strategies)
 - [Supporting the County's shrub-steppe mitigation program](#)
- Manage invasive species on agricultural lands and maintain native species diversity.
- Promote voluntary measures to enhance shrub-steppe habitat and shrub-steppe corridors with the first priority being basins where the benchmark of shrub-steppe protection of functions and values is at risk of degrading compared to baseline. Within basins, enhancement opportunities should first include current blocks and currently utilized corridors and then historical or likely suitable corridors that could be established or renewed.
- Encourage diversity of native grasses in place of cheatgrass to promote resiliency.