Grant County
Voluntary Stewardship Program

Work Plan (Approved)

June 2017

Funded by Washington State Conservation Commission

June 2017
Grant County Voluntary Stewardship Program

Work Plan (Approved)

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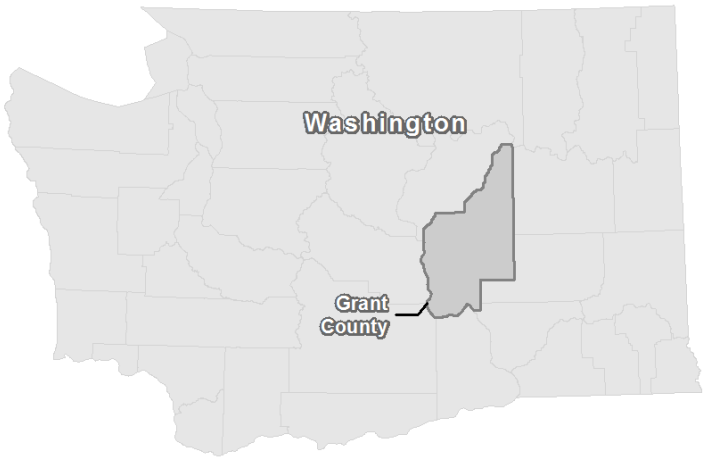
ABBREVIATIONS

AWEP	Agricultural Water Enhancement Program
CAO	Critical Areas Ordinance
CARA	critical aquifer recharge area
CBP	Columbia Basin Project
County	Grant County
CPPE	Conservation Practice Physical Effect
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
Ecology	Washington State Department of Ecology
EQIP	Environmental Quality Improvement Program
FEMA	Federal Emergency Management Agency
FFA	frequently flooded area
FSA	Farm Service Agency
GCC	Grant County Code
GCCD	Grant County Conservation District
GHA	geologically hazardous area
GMA	Growth Management Act
HCA	fish and wildlife habitat conservation area
HEL	highly erodible land
NRCS	Natural Resources Conservation Service
NRI	Natural Resources Inventory
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
TMDL	total maximum daily load
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VSP	Voluntary Stewardship Program
WDFW	Washington Department of Fish and Wildlife
WHIP	Wildlife Habitat Improvement Program
Work Group	Grant County VSP Work Group
Work Plan	Grant County VSP Work Plan
WRIA	Water Resource Inventory Area
WSCC	Washington State Conservation Commission
WSDA	Washington State Department of Agriculture



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Acknowledgements:
Harold Crose with the Grant County Conservation District, supported by Anchor QEA, led much of the technical development of the Work Plan under direction from the Work Group.

Funded by:
Washington State Conservation Commission

1 Introduction

1.1 Voluntary Stewardship Program Overview

The Washington State Growth Management Act (GMA) was adopted by the Washington State Legislature in 1990. The GMA provides for citizens, communities, local governments, and the private sector to cooperate and coordinate in comprehensive land-use planning. The GMA requires county and local governments to adopt development regulations that protect critical areas.

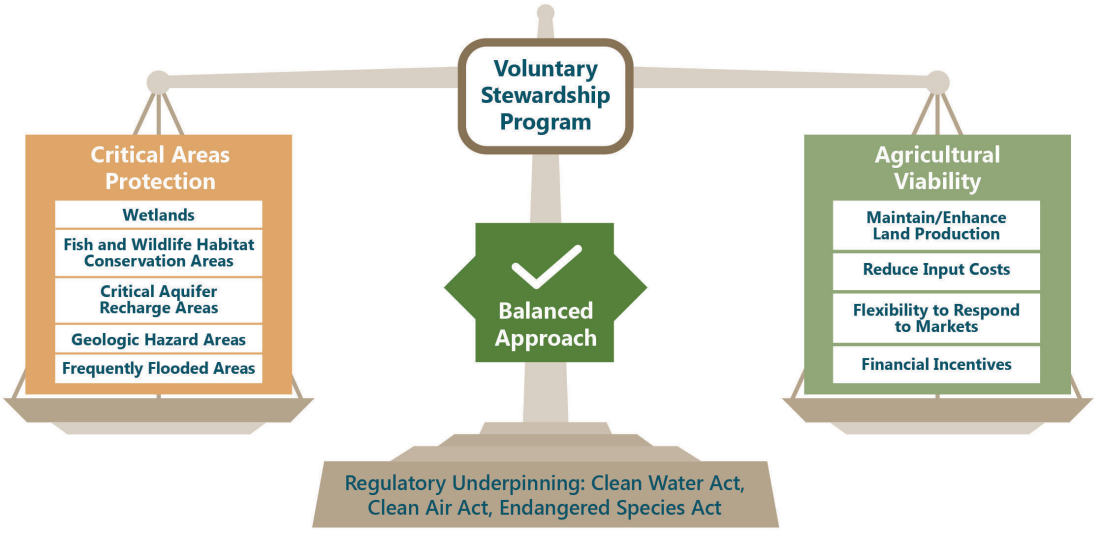
In 2011, the Legislature amended the GMA with the intent to protect and voluntarily enhance critical areas in places where agricultural activities are conducted, while maintaining and enhancing the long-term viability of agriculture. This amendment established the Voluntary Stewardship Program (VSP), 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 Ordinance (CAO). VSP is not a replacement for compliance with other local, state, or federal laws and regulations, but participation in VSP will help to show how much effort the County's agricultural producers are investing in meeting these requirements and to document the benefits of these efforts in protecting and enhancing critical area functions and values (Figure 1-1).

Critical Areas per RCW 36.70A.020(5) include:

- Wetlands
- Fish and wildlife habitat conservation areas
- Critical aquifer recharge areas
- Geologically hazardous areas
- Frequently flooded areas

Under VSP, critical areas on lands where agricultural activities are conducted are managed under this voluntary program. Lands used for non-agricultural purposes are regulated under Grant County's Critical Areas Ordinance (CAO).

Figure 1-1
Balanced Approach of Critical Areas Protection and Agricultural Viability



VSP presents a unique opportunity to address an important environmental topic that has been a source of controversy in recent decades—how to protect critical areas on agricultural lands while keeping agriculture economically viable (Schultz and Vancil 2016).

Opting into VSP

In 2012, the Board of County Commissioners of Grant County passed a resolution to "opt-into" the VSP as an alternative to the traditional regulatory approaches to protecting critical areas on lands where agricultural activities are conducted.

What are considered "agricultural activities" under VSP?

VSP applies to lands where agricultural activities are conducted, as defined in RCW 90.58.065.

Agricultural activities mean agricultural uses and practices including, but not limited to:

- Producing, breeding, or increasing agricultural products, including livestock
- Rotating and changing agricultural crops
- Allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded
- Allowing land used for agricultural activities to lie dormant as a result of adverse agricultural market conditions
- Allowing land used for agricultural activities to lie dormant because the land is enrolled in a local, state, or federal conservation program, or the land is subject to a conservation easement
- Conducting agricultural operations
- Maintaining, repairing, and replacing agricultural equipment; maintaining, repairing, and replacing agricultural facilities, provided the replacement facility is no closer to the shoreline than the original facility
- Maintaining agricultural lands under production or cultivation.

1.2 Work Plan Elements

The guiding document for the VSP is this Grant County VSP Work Plan (Work Plan), the goal of which is to protect critical areas while maintaining the viability of agriculture. The Work Plan was developed by the Grant County VSP Work Group (Work Group), convened by the County and comprised of agricultural producers, local government elected officials and staff, agency representatives, and interest groups.

1.2.1 Work Plan Goals

One of the main goals of the Work Plan is to identify stewardship practices that are implemented under existing programs or voluntarily implemented through producer-funded practices and identify goals and benchmarks for continued protection and enhancement of the County's critical area functions and values.

Producer participation is a key component of Work Plan implementation and program success. **Failure of the Work Plan in meeting protection goals will trigger a regulatory approach to protecting critical areas under the GMA,** such as applying buffers and setbacks along streams or wetlands. Additionally, the regulatory approach for protecting critical areas on agricultural lands would not have the equally important VSP goal of maintaining and enhancing agricultural viability. Neither would it necessarily encourage outreach or technical assistance for agricultural operators. Therefore, producer participation will be encouraged as a central component of the Work Plan, through new and continued implementation of stewardship strategies and practices, to help ensure the success of VSP and protect agricultural viability.

Stewardship Practices:
Examples of practices that protect critical area functions and values and promoting agricultural viability include:

- Water management
- Direct seed/No Till
- Cover crops
- Prescribed grazing

See the **VSP Checklist** for additional examples of voluntary stewardship practices, and resources for additional information and potential incentive funding.

No Till Corn in Wheat Stubble

The Work Group developed a *Grant County VSP Overview and Checklist* to provide a summary overview of VSP and the Work Plan, including frequently asked questions and a VSP Checklist, as an outreach and implementation tool to help assess how the VSP could apply to individual agricultural producer's lands. The VSP Checklist includes additional examples of stewardship practices that protect and enhance critical areas and promote agricultural viability.

1.2.2 Work Plan Organization

This Work Plan, including its appendices, includes detailed information intended to fulfill the state requirements outlined under the Revised Code of Washington (RCW) 36.70A.720(1)(a through l), which requires Work Plans to include critical area protection and enhancement goals with measurable benchmarks, and an implementation, reporting, and tracking framework.

Grant VSP Work Plan Organization

- **Section 1 – Introduction:** Background on VSP regulation and how it applies to the County
- **Section 2 – Grant County Regional Setting:** Overview of County conditions, including description of critical areas
- **Section 3 – Baseline and Existing Conditions:** Description of county-wide critical areas presence and functions and values as of 2011
- **Section 4 – Protection and Enhancement Strategies:** Description of currently implemented conservation practices that protect and enhance critical areas functions and values
- **Section 5 – Goals, Benchmarks, and Adaptive Management:** Description of VSP goals for critical area protection and enhancements, measurable benchmarks, and indicators and methods for adaptive management
- **Section 6 – Implementation:** Detailed plan outlining implementation of VSP actions by the VSP Lead
- **Appendices:** Additional detailed information referenced by the above sections

Producer participation is a key component of Work Plan implementation and success of the program. The Work Group developed a Grant *County VSP Overview and Checklist* to provide a summary overview of VSP, including frequently asked questions, and a VSP Checklist as an outreach and implementation tool to help assess how the VSP could apply to individual agricultural producer's lands. The VSP Checklist includes additional examples of stewardship practices that protect and enhance critical areas and promote agricultural viability.

1.3 Work Plan Development – Roles and Responsibilities

RCW 36.70A.705 identifies roles and responsibilities for state agencies, counties, and VSP work groups. Table 1-1 provides a summary of these roles and responsibilities, adapted to the Work Plan development process. Administrative, technical, and collaborative roles and responsibilities are included in the Work Plan development process spanning state, county, and local levels. Grant County designated the Grant County Conservation District (GCCD) to manage and facilitate the VSP process. The GCCD, under direction of the Work Group and supported by Anchor QEA, led the development the Work Plan for Grant County. The Work Plan was developed through a series of nine Work Group meetings, beginning on April 26, 2016 through May 22, 2017. Meetings were typically held on the fourth Monday of the month. Meeting agenda and materials were also emailed to the VSP interested parties/contact list including tribes for all Work Group meetings (see Appendix E for contact list). Additional outreach was conducted to seek input from agencies and stakeholders through community meetings, newsletters, individual meetings, and other methods as described the Grant County VSP Outreach Plan (Appendix E).

Implementation roles and responsibilities for the Work Plan are further described in Section 6.

Table 1-1
VSP Roles and Responsibilities for Plan Development

State – Approval and Administration	
WSCC	Administers VSP statewide; approves/rejects locally developed work plans
VSP Technical Panel [1]	Provides technical guidance and assistance, reviews draft work plans, makes recommendations on whether to approve or reject the work plan
VSP Statewide Advisory Committee [2]	Works with the WSCC to revise rejected draft work plans
Local – Administration and Work Plan Development	
Grant County	Administers VSP funding and grant for work plan development
Grant County VSP Work Group	Develops and proposes a work plan for approval by WSCC
Grant County Conservation District	Provides technical information to support work plan development and manages and facilitates the VSP process
Other Technical Providers	Provides technical input during work plan development
Agricultural Producers – Outreach Focus	
Landowners/Operators/Others	Provide input to the draft work plan

Notes:

1. The VSP Technical Panel members include representatives from Washington State Department of Ecology, Washington Department of Fish and Wildlife, Washington State Department of Agriculture, and the WSCC.
2. The Committee includes two representatives each from environmental interests, agriculture, and counties; two tribal representatives are also invited to participate.

WSCC: Washington State Conservation Commission
VSP: Voluntary Stewardship Program

2 Grant County Regional Setting

2.1 Grant County Profile

Grant County is located in central Washington and bound by the Columbia River to the west and southwest. Agriculture, land use, hydrology, and habitat in the County are heavily influenced by the Columbia Basin Project (CBP), which delivers water from the Grand Coulee Dam for agricultural and municipal uses. The CBP also brought about major changes to the hydrology and land use in the region through the diversion of water to the historically semi-arid region.

This section provides a County profile description for the following items (Appendix A: VSP Map Folio for associated maps):

- Water resources and precipitation
- Soils and terrain
- Land use and landcover

Columbia Basin Project

The Columbia Basin Project (CBP) is a network of dams, pumping plants, and irrigation canals and reservoirs that provide irrigation water over 670,000 acres. The water for these facilities is supplied by Grand Coulee Dam and Franklin D. Roosevelt Lake. Once water enters the irrigation system, it is used multiple times, through runoff, collection in reservoirs, and reuse, before returning to the Columbia River. In total irrigators use approximately 2.5 million acre feet (annually) of water though the CBP. In addition to providing irrigation water to Grant county the CBP also generates power, provides recreation opportunities, controls floods, and aids navigation (Reclamation 2016).

2.1.1 Water Resources and Precipitation

The County includes portions of six watersheds, which are known as Water Resource Inventory Areas (WRIAs). Most of the County is in the Lower Crab (WRIA 41). The southern portion of the County is in the Esquatzel Coulee (WRIA 36). The northern portion of the County is largely in the Grand Coulee (WRIA 42), with portions in the Upper Crab-Wilson (WRIA 43), Moses Coulee (WRIA 44), and Lower Lake Roosevelt (WRIA 53) (Appendix A, Figure 1).

Precipitation ranges from less than 8 inches of annual precipitation in the central and southern portion of the County (near Mattawa and the Royal Slope) to greater than 12 inches in the northeast portion of the County (Appendix A, Figure 2).

Lower Crab Creek

2.1.2 Soils and Terrain

The northern portion of the County is characterized by hilly topography and soils that formed in wind-blown sediments, known as loess, dissected by channeled scablands largely stripped of soils by glacial floodwaters (Appendix A, Figure 3). Soils in this region are primarily used for dryland farming, livestock, and wildlife habitat near the Columbia River. The southern portion of the County consists of smooth plains (southward-sloping) periodically broken up by Frenchman Hills and the Saddle Mountains (USDA 1984).

2.1.3 Land Use and Landcover

The County is predominantly rural and dominated by agricultural and larger land tracts outside of cities and towns. The three largest cities in the County are Moses Lake, Ephrata, and Quincy, where the majority of housing, commercial, and industrial activities are centered.

Agriculture on privately owned lands comprises approximately 68% of the County's landcover, which is generally associated with one of these three categories: 1) irrigated crops; 2) dryland crops; and 3) rangelands (Table 2-1 and Appendix A, Figure 4,).

Table 2-1
Agricultural Landcover Summary

Landcover	Acres	Percent of County
Total Area in County	**1,758,594**	**NA**
Agricultural Landcover[1]	**1,195,519**	**68%**
Irrigated	477,783	27%
Dryland	317,005	18%
Rangelands	400,731	23%

Notes:
1. Privately-owned agricultural lands
NA: Not applicable

Major Resource Concern

Wind-induced soil erosion is a major management concern within the County, where 92% of the County is classified under moderate to high wind-erosion susceptibility (NRCS 2015), which includes 38% of privately owned agricultural lands. The central areas, southwest of Moses Lake, which include soils largely comprising fine sands or sandy loams in areas with high winds, are the most susceptible to soil loss from wind erosion.

Section 3 includes further discussion on where these areas intersect with agricultural lands.

Range Planting

2.2 Agricultural Activities

Agriculture is the major land use in the County. The Work Plan's goals and measurable benchmarks for voluntary landowner participation apply to agricultural producers on privately owned land in unincorporated areas of the County, which comprise approximately 68% of the County's lands.

Grant County has highly productive irrigated agricultural lands due to the consistent water supply from the CBP, favorable climate, and highly productive soils. Irrigated and dryland crops comprise 27% and 18% of County lands respectively. Grant County crop lands produce approximately 76% of the value of products sold in the County (USDA 2012). Rangelands account for 23% of County, land

and County-wide livestock sales account for approximately 24% of the value of products sold (USDA 2012). See Appendix A, Figure 4 for the County agricultural landcover map.

Irrigated Agricultural Practices

In recent years, conversion from rill irrigation to sprinkler irrigation has brought about significant reduction in irrigation-induced erosion. Irrigation management systems have improved to the point of eliminating much of the irrigation-related erosion that has been a historical concern on irrigated agricultural lands in the County.

See Section 4 for additional protection and enhancement strategies.

Orchard Drip Irrigation

Statewide, according to the U.S. Department of Agriculture's (USDA) Census of Agriculture (2012), Grant County:

- Is the top producer of vegetables (sales value) in Washington.
- Is the second highest producer of fruit (sales value) in Washington.
- Is the top producer (sales value) for cattle and calves in Washington.
- Has the highest acreages of vegetables, hay, and corn (for grain) in Washington.
- Has a market value from agricultural products of approximately $1.7 billion.

See Table 2-2 for summary of agricultural landcover and major agricultural products within the County.

Table 2-2
Agricultural Activity and Products (Private Lands)

Agricultural Type	% of County	Primary Crops/Livestock
Irrigated	27%	• Vegetables • Tree fruit (e.g., apples and cherries) • Vineyards • Dairy • Potatoes • Wheat • Legumes • Corn • Hay • Seed Crops
Dryland	18%	• Wheat • Canola
Rangeland	23%	• Cattle • Horses
Total	**68%**	

Sources:
WSDA Agricultural Landcover Data 2011
USDA 2012

The 1,552 farms in the county vary in size ranging from relatively small, with agricultural product sales of less than $10,000, to large, with agricultural product sales of greater than $500,000 (Table 2-3).

Table 2-3
Size of Farms in Grant County Based on Agricultural Product Sales

Farm Agricultural Product Sales (Dollars)	% of Farms
Less than 10,000	37%
10,000 to 100,000	16%
100,000 to 250,000	10%
250,000 to 500,000	9%
Greater than 500,000	28%

2.3 Critical Areas

2.3.1 Critical Areas Definitions

The five critical areas that are specifically defined under the GMA (RCW 36.70A.030) include: 1) wetlands; 2) fish and wildlife habitat conservation areas (HCAs); 3) critical aquifer recharge areas (CARAs); 4) geologically hazardous areas (GHAs); and 5) frequently flooded areas (FFAs). Critical areas perform key environmental functions (e.g., water quality and fish and wildlife habitat) and provide protections from hazards (e.g., flood, erosion, or landslide hazards).

The County has identified five critical areas that will be managed under the Work Plan: wetlands, HCAs, CARAs, GHAs for erosion hazards, and FFAs for all agricultural activities. Any structures (as defined in Grant County Code [GCC] 25.02.030) that are proposed within agricultural lands for any of the five critical areas, whether they support agricultural activities or not, will continue to be regulated through the County's CAO (GCC Chapter 24.08), as applicable. Additionally, other critical area provisions that are incorporated into this work plan and that will continue to be reviewed under the County's CAO include:

- **GHAs for landslide, mine, and seismic hazards:** Structures in agricultural lands will continue to be permitted and regulated through the County's CAO, notably for landslide, mine, and seismic hazard areas. Geologically hazardous areas for erosion hazards have primary applicability in the VSP context.
- **Cultural resource areas:** The County's CAO identifies Cultural Resource Areas as a County critical area. Cultural Resource Areas will continue to be reviewed and regulated through the County's CAO as the intent of VSP is to protect environmentally critical areas through ecosystem stewardship activities, and other state and federal regulations provide protections for cultural resource areas.

The County's CAO includes identification and designation criteria for these five critical areas, which are summarized in Appendix B-3.

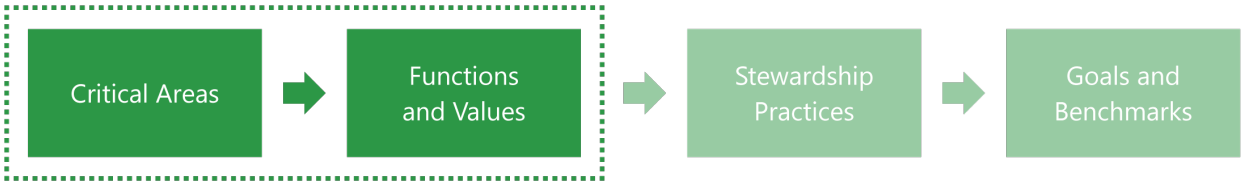
Wetlands 	Wetlands are areas inundated or saturated by surface water or groundwater for at least part of the growing season and support vegetation adapted for life in saturated soil conditions. Some irrigation-influenced artificial wetlands may be exempt from this designation (see Washington State Department of Ecology guidance[1]). **Functions:** Water quality, hydrology, and habitat
Fish and Wildlife Habitat Conservation Areas (HCAs) 	Fish and Wildlife HCAs are lands and waters 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 **Functions:** Water quality, hydrology, soil, and habitat
Critical Aquifer Recharge Areas (CARAs) 	CARAs are areas that have a critical recharging effect on aquifers used for drinking water, including aquifers vulnerable to contamination or that could reduce supply by reducing recharge rates and water availability. **Functions:** Water quality and hydrology
Geologically Hazardous Areas (GHAs) 	GHAs are areas susceptible to erosion, sliding, and other geological events. In Grant County, designated GHAs related to agricultural activities are primarily associated with erosion hazard areas, which include high to very-high water erosion hazard. Wind is the major source of erosion in Grant County. Although wind erosion potential areas are not specifically designated as critical areas, they are discussed under GHA in this VSP. **Functions:** Water quality, hydrology, soil, and habitat
Frequently Flooded Areas (FFAs) 	FFAs includes 100-year floodplains and floodways, and often include the low-lying areas adjacent to rivers and lakes that are prone to inundation during heavy rains and snowmelt. These can include streams, rivers, lakes, wetlands, and areas where high groundwater forms ponds. **Functions:** Water quality, hydrology, soil, and habitat

[1] Ecology guidance on irrigation influenced wetlands available at https://fortress.wa.gov/ecy/publications/documents/1006015.pdf.

2.3.2 *Critical Areas Functions and Values*

VSP legislation requires that work plans develop goals and benchmarks to protect and enhance critical area **functions and values** (RCW 36.70A.720(1)(e)). The key functions and values provided by the five critical areas in the County can be summarized into four major functions, which include: 1) water quality, 2) hydrology, 3) soil, and 4) habitat (Figure 2-1). The goals and benchmarks developed for this Work Plan, included in Section 5, are based on protection and enhancement for these four key functions.

Figure 2-1
VSP Crosswalk – Critical Areas Connection with Functions and Values



Each critical area provides one or more of these key functions and values, which are summarized in Table 2-4. The relationship between each critical area with key functions and values are discussed further in the following sections. See Section 3.1 for further discussion on the baseline conditions of critical areas within the County's agricultural lands. See Section 4 for key stewardship practices that provide functional benefits to these key functions.

Table 2-4
Critical Areas Functions

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

Water Quality Function

Critical areas, such as stream channels, riparian areas, and wetlands, are a part of the aquatic ecosystem that filters and retains excess fine sediments and cycles out excessive nutrients (such as phosphorus and nitrogen) and other pollutants. These functions provide cleaner water, which is essential for supporting habitat for fish and other aquatic species. Critical areas also help moderate

water temperatures by providing vegetative shade and cooler water from recharged groundwater, which helps maintain cooler in-water temperatures and dissolved oxygen levels needed to support aquatic species.

In Grant County, some water bodies (including the Columbia River, Potholes Reservoir, and Lower Crab Creek) exceed state standards for pollutants such as pH, dissolved oxygen, and temperature (Ecology 2016a). Agriculture can affect surface and groundwater water quality through excess nutrients from fertilizers, bacteria from livestock (e.g., fecal coliform), toxins from chemical inputs, and sediment from soil erosion. However, fertilizer, sediment, and toxin inputs are also associated with paved or turfed landscapes, and septic systems also contribute to fecal coliform issues. Agriculture preserves lands from more intensive development.

All five of the County's critical areas provide water quality functions, as summarized Table 2-5.

Table 2-5
Critical Areas Providing Water Quality Functions

Critical Area	Water Quality Functions
Wetland	• Reduces siltation and erosion • Provides water filtration • Moderates water temperature by providing shade
HCA	• Reduces siltation by stabilization of streambanks from riparian vegetation • Provides water filtration • Moderates water temperature by providing shade
CARA	• Infiltration through soil column and underlying geology improves groundwater quality and protects public drinking water supplies
GHA	• Effects rate of soil erosion and associated movement of sediment deposited in surface waterbodies
FFA	• Vegetation in FFAs holds underlying soil in place and also provides area for new sediment depositions to settle out • Moderates water temperature by shallow groundwater infiltration and releases from unconfined aquifers of cooler groundwater back to streams, and by vegetation that can provide shade

Hydrology

Hydrology is the process of water delivery, movement, and storage. In an ecosystem, hydrology is affected by landform, geology, soil characteristics and moisture content, and climate (including precipitation). Water is delivered to streams primarily from surface and shallow subsurface runoff and, in some cases, from groundwater. Stream channels, riparian areas, and wetlands are also a part of the aquatic ecosystem that stores and transports water and sediment, maintains base flows, and can support vegetation and microorganism communities.

In Grant County, hydrology is heavily influenced by the CBP, which delivers water from the Grand Coulee Dam on the Columbia River to the County for agricultural uses. The Columbia River along the County west and southwest boundary is mainly regulated by a series of dams. Lake Roosevelt, behind the Grand Coulee Dam, provides water for the CBP and facilitates conveyance of irrigation water to a large portion of Grant County bringing water into a historically semi-arid region. The CBP includes a series of canals and wasteways that deliver irrigation and municipal water from the Columbia River throughout the County. CBP water management has affected natural streams and created wetlands in Grant County by raising the water table. This has caused Lower Crab Creek to change from an intermittent creek to a perennial creek (KWA Ecological Services 2004).

All five of the County's critical areas provide hydrology functions, as summarized in Table 2-6.

Table 2-6
Critical Areas Providing Hydrology Functions

Critical Area	Hydrology Functions
Wetland	• Stores water to reduce flooding and contributes to base flows
HCA	• Stores and retains water to reduce flooding and support base flows in streams
CARA	• Recharges groundwater resources
GHA	• Rate of groundwater infiltration and rate of surface water runoff
FFA	• Stores and retains surface water in floodplain, reducing velocities and modifying discharge rates • Recharges groundwater that can later be returned to the stream to help maintain base flow

Ancient Lakes Wetlands

Soil Function

Soil provides an underground living ecosystem, which is essential for preserving plants, animals, and human life. Soil conservation is essential in the County to support healthy soils that have the following characteristics:

- Reduce susceptibility to erosion
- Hold and slowly release water (see hydrology function section for more detail)
- Filter pollutants and, in many cases, detoxify them
- Store, transform, and cycle nutrients
- Physically support plants

In Grant County, agriculture preserves lands from more intensive development, and farmers can be the County's most effective soil managers by effectively managing tillage, pesticide, and fertilizer applications to the lowest effective level. Intensive tillage reduces surface residue, can lead to increased erosion and soil loss, and intensifies loss of soil organic matter. High concentrations of fertilizers can inhibit nitrogen fixation and stimulate nitrification, and improperly applied pesticides (crop protectants) can impact beneficial soil organisms. Wind-induced soil erosion is a major concern on agricultural lands in the County in areas with high wind energy and sandy soils.

Three of County's critical areas provide soil functions, as summarized in Table 2-7.

Table 2-7
Critical Areas Providing Soil Functions

Critical Area	Soil Functions
HCA	• Reduces rate of erosion by providing vegetative cover
GHA	• Improves structure of soil to minimize some types of erosion
FFA	• Supports moisture content in soils, reduces rate of erosion, and supports plant growth that can increase organic inputs to soil

Fish and Wildlife Habitat

Habitats are the natural environment in which a particular species or population can live. The habitat requirements are unique for different species and can be unique for different life stages of a species. Habitat loss is the primary threat to the survival of native species.

In Grant County, agriculture practices and the CBP has impacted historical habitats by replacing a landscape historically comprising sagebrush-bunchgrass ecosystems with an intensely-managed agricultural landscape. Although agriculture lands can provide vast tracts of semi-natural habitat, species biodiversity is typically higher in the remnant natural areas in the County, including shrub-steppe habitat, and within the wildlife refuges set aside in the County by federal authorities to

compensate for the loss of wildlife habitat due to the construction of the CBP dams. Farmers who provide greater landscape variability, and high perimeter-to-area habitats on their land, can provide meaningful benefit to many different species (Weibull et al 2002).

There is a great deal of high-quality deer and bird habitat on rangelands and land that is actively farmed. Farming practices provide a variety of habitat functions, including providing cover. Crops provide a food source for herbivores, such as deer, and birds help control insect and rodent populations. Fish species use wetlands and streams in the County. See Appendix A, Figure 6, and Appendix B-4, Tables 5 and 6 for a summary of priority habitats and species data mapped or documented in the County.

Quail within pivot irrigation corner habitat

Four of County's critical areas provide habitat functions, as summarized in Table 2-8.

Table 2-8
Critical Areas Providing Habitat Functions

Critical Area	Habitat Functions
Wetland	• Provides aquatic and woody vegetated habitat for fish and wildlife
HCA	• Provides in-stream spawning, rearing and migratory habitat for fish • Provides upland and riparian migration corridors, refuge, forage, nesting, and rearing areas for wildlife, such as sage grouse • Provides aquatic habitat by supplying organic inputs (e.g., leaf fall, insects, and large wood) • Supports sensitive species lifecycles
GHA	• Rate of erosion as it relates to sediment inputs to stream and wetland aquatic habitat
FFA	• Provides aquatic and riparian habitats for wildlife, plants, and fish

3 Baseline and Existing Conditions

The effective date of the VSP legislation is July 22, 2011. This is also the date chosen by the legislature as the applicable baseline for accomplishing the following items (RCW 36.70A.703):

- Protecting critical areas functions and values,
- Providing incentive based voluntary enhancements to critical areas functions and values,
- Maintaining and enhancing the viability of agriculture in the County.

The 2011 baseline sets the conditions from which the County will measure progress in implementing the Work Plan and meeting measurable benchmarks (see Section 5). Stewardship strategies and practices have been implemented since 2011 to improve agricultural productivity, reduce erosion, and improve water and soil quality.

It's important to note that changes to baseline conditions outside of VSP are likely to occur due to effects from climate change, natural events (e.g., wild fires), changes in hydrology from the CBP, or other changes outside of the scope of VSP. These changes would be documented through the reporting and adaptive management process discussed in Sections 5 and 6.

Historic Conditions and the Columbia Basin Project

Human activities have affected natural resources within the County since the late 1800s when large-scale conversion of shrub-steppe habitats to cropland began (KWA Ecological Sciences 2004). Changes to the landscape expanded when irrigation became widespread after the construction of the Grand Coulee Dam and establishment of the Columbia Basin Project in the mid-1900s. The delivery of irrigation water from the Columbia Basin Project dramatically changed the appearance and ecology of Grant County from mostly semi-arid shrub steppe to a huge system of reservoirs, canals, wasteways, and irrigated farmland (KWA Ecological Sciences 2004).

Columbia National Wildlife Refuge (USFWS)

Grant County now supports diverse populations of fish and wildlife within the new habitats created by the diversion of water to the semi-arid region. It is not the intent of VSP to restore natural resources to pre-development conditions, but to protect critical areas functions and values that existed in 2011.

3.1 Baseline (2011) Intersection of Critical Areas and Agricultural Land Uses

This section provides a baseline conditions summary of the intersections of critical areas on agricultural lands. The following appendices provide additional information and methods relied upon for the baseline conditions summary:

- Appendix A: VSP Map Folio
- Appendix B: Baseline Conditions Summary (includes methods, data sources, and critical areas data summary tables)

The overlap between agricultural land use and critical areas generally accounts for only a small percentage of the total agricultural land in the County (Table 3-1). Most agricultural lands do not contain critical areas other than soil erosion hazard areas. However, most of the CARAs and HCAs in the County are on agricultural lands. Although the fraction of agricultural lands that intersect with these critical areas is a relatively small fraction of the County's agricultural land base, these lands include many areas of high-functioning habitats, which provide important ecological functions. The CBP has also directly and indirectly created significant habitat types, such as wetland, lake and riparian habitats.

Tables 3-1 and 3-2 summarize the potential presence of critical areas within the County that intersect with agricultural activities on private lands.

Table 3-1
Critical Areas Within Grant County Agricultural Lands

Critical Area Type		Acres Within Agricultural Lands[1]	% of Total Agricultural Lands[1]
Wetlands (all types)		7,043	<1%
Fish and Wildlife Habitat Conservation Areas[2] *(Also includes about 2,627 stream miles)*		123,254	10%
Critical Aquifer Recharge Area		23,204	2%
Geologically Hazardous Areas	Water Erosion	258,401	22%
	Wind Erosion	459,093	38%
Frequently Flooded Areas		21,798	2%

Notes:

1. Agricultural areas included in this summary are limited to privately owned lands. Publicly owned land is not managed under VSPs.
2. These areas include sensitive, candidate, and threatened species and habitats mapped in WDFW's Priority Habitat and Species (PHS) data and maps, consistent with the County's CAO definition of Fish and Wildlife Habitat Conservation Areas. See Appendix A, Figure 6, and Appendix B-4 for additional details on PHS species, including recreation and game species. Area numbers in this table, except where they overlap with other PHS that are the primary focus for protection under VSP.

Game species in Priority Habitat and Species (PHS):

PHS data and mapping are maintained by Washington Department of Fish and Wildlife (WDFW) in part to provide a reference to the potential existence of HCAs. Game species habitat are mapped in PHS within approximately 165,000 acres of the County's private agricultural lands, comprising primarily of mule deer, pheasant, and chukar habitat. These habitats almost entirely overlap existing dryland agriculture and range lands. Agriculture is expected to continue providing a suitable habitat for these game species.

- **Protection goals:** Protection efforts under VSP are focused on the rare and undisturbed natural habitats that exist in the County, such as wetlands, cliffs and bluffs, riparian areas and shrub steppe. Game species areas that overlap with existing agricultural lands are not the primary protection focus of this Work Plan, except where there is overlap with other habitat types as referenced above. The protection goals included in the Work Plan (Section 5.1) for these habitats is also expected to benefit game species.
- **Enhancement goals:** Enhancement efforts under this Work Plan includes conservation efforts that focus on improving habitat conditions for game (along with other species) on existing agricultural lands (e.g., Conservation Reserve Program, pivot irrigation corner, or field fringe habitat). These enhancement efforts will be accounted towards meeting the Work Plan's enhancements goals and benchmarks.

See Appendix A, Figure 6, and Appendix B-4 for additional details on PHS species, including recreation and gaming species.

Grant County has a wide variety of soils that vary in texture, drainage, and other characteristics (USDA 1984). The area southwest of Moses Lake largely comprises sandy soils that are mapped in the wind erodibility group as the most susceptible to wind erosion. Wind erosion is a major concern in terms of soil loss from agricultural activities, crop damage, airborne sediments impacting streams and lakes, and public health and safety. Wetlands are generally associated with the 3,525 miles of streams and water management measures associated with reservoirs, irrigation canals, wasteways, and irrigation.

Table 3-2
Critical Area Streams Within Grant County Agricultural Lands

Stream Type	Miles in County	Miles Within Agricultural Lands	% Within Agricultural Lands
Streams Total[1]	3,525	2,170	62%
Shorelines of the State	369	48	
Potential Fish Use	44	9	
No Fish Use	7	4	
Unknown	3,106	2,109	

Note:

1. Many streams mapped within the Washington Department of Natural Resources' "Unknown" stream types within the County that were identified as irrigation canals and drainages through the County's Shoreline Master Program update effort (Grant County 2014) were excluded from this summary. HCAs do not include 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. RCW 36.70a.030(5). Other "Unknown" stream types would need to be verified on the ground as part of farm stewardship planning to identify appropriate protections for potential stream and riparian functions and associated fish life or habitat use, as applicable.

3.1.1 Wetlands

Characteristics and functions overview: 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.

Intersections on agricultural lands: Per mapped resources, wetlands are found within 0.6% of the County's total agricultural lands (Appendix A, Figure 5), which represents approximately 10% of the wetlands found within the County. The development of the CBP has directly and indirectly facilitated the formation of many of the wetlands within the County. The extent of wetlands within the County are subject to ongoing water management practices, including water efficiency and stewardship practices for the delivery and use of water for irrigation, which will affect the volume and timing of surface water available to support some wetlands. Improving water management practices, which is happening through projects and practices implemented in Grant County each year, affects the size and number of wetlands and associated habitats within the County. When wetlands dry up in the County from improved water management practices, then they are no longer considered part of VSP baseline conditions.

Wetlands on Agricultural Lands	
General locations/ distribution	Mostly present along: • Reservoirs, streams, and creeks receiving return flows from the Columbia Basin Project (CBP), or other water sources. These are found primarily along Crab Creek, Lower Crab Creek, Rocky Ford Creek, and Lind Coulee • CBP main canals, laterals, and wasteways including the Winchester and Frenchman Hills wasteways • Reservoirs (Potholes and Banks Lake) and other lakes, many of which were formed as a result of the CBP
Intersections with agricultural lands	• Most are within rangelands, with some on dryland and irrigated agricultural lands
Characteristics	• Most are freshwater emergent seasonal wetlands

Irrigation-influenced Wetlands

Many wetlands within Grant County are considered unintentional wetlands, resulting from localized conditions such as unlined irrigation ditches and tailwater from surface irrigated fields. These types of wetlands are considered jurisdictional wetlands regulated by state wetland law. However, if the irrigation practices and infrastructure upgrades are changed (such as implementation of water conservation practices and lining and piping ditches), and the wetland dries up and no longer performs wetland functions, then no mitigation is required (Ecology 2010).

Cattails along wasteway near Potholes Reservoir

Columbia Basin Project: Expanding Wetlands and Habitat

The first irrigation water began flowing through the CBP system in 1951. Almost immediately, this introduction of large amounts of water to the land, along with seepage from canals and laterals, and return flows from rill-irrigated fields, impacted the underlying groundwater levels, requiring extensive surface and subsurface drainage systems in order to farm much of the land. In this process, many lakes, ponds, and marshes also appeared in low-lying areas.

By 1980, when the last stage of the CBP was completed, the acreage of wetlands in the Columbia Basin was at least 20 times larger than it had been earlier. Migrating waterfowl were drawn to the region both by the water and by greatly increased food supplies provided by the irrigated crops and bugs, grubs, and invertebrates in the soil.

Anticipating this effect, and compensating for loss of wildlife habitat due to construction of the dams, federal authorities set aside several wildlife refuges in the Columbia Basin in the 1930s and 1940s. Among these was the Columbia National Wildlife Refuge south of Potholes Reservoir, established in portions of Adams and Grant counties in 1944, and managed by the U.S. Fish and Wildlife Service since 1955 (Tate 2016).

3.1.2 Fish and Wildlife Habitat Conservation Areas – Streams and Riparian Vegetation

Characteristics and functions overview: HCAs include streams, riparian vegetation, and upland habitats that provide water quality, hydrology, soil health, and habitat functions. HCAs provide migratory migration corridors; breeding/reproduction area; forage, cover and refugia space; and wintering habitat for wildlife species. Streams provide a key habitat and streamside vegetation functions as a source of organic materials, habitat structures and cover, streambank stabilization, and shade to help regulate water temperatures. Large HCAs provide for species that require large spaces or range for migration, forage, and cover. Habitats of local importance may support sensitive species throughout their lifecycle, or are areas that are of limited availability, or high vulnerability to alteration. HCAs (riparian areas and wetlands) help improve water quality, affect hydrology, contribute to soil health, and provide a variety of habitats

Intersections on agricultural lands: Of the total stream miles mapped within the County, 62% are within agricultural lands (Appendix A, Figure 5). Approximately 50% of the County's streams with riparian vegetation are within agricultural lands[2]. The extent of streams and riparian vegetation within the County are significantly influenced by return flows from the Columbia Basin.

HCAs do not include irrigation delivery systems, RCW 36.70a.030(5). Identified irrigation features were excluded from the County's stream analysis within this Work Plan, including streams mapped within the Washington Department of Natural Resources' "Unknown" stream type within the County that were identified as irrigation canals and drainages through the County's Shoreline Master Program update effort (Grant County 2014). Although HCA streams do not include ponds deliberately created from dry sites, including canals and detention facilities (Grant County Code 24.08.300[a][4]), it is recognized that these canals and ditches provide, directly and indirectly, significant fish and wildlife habitat benefits.

Riparian Vegetation
Riparian vegetation includes the vegetated areas along water sources (wetlands and streams) characterized by plants accustomed to moist soil and high water table conditions than adjacent areas. In Grant County, riparian vegetation typically consists of grasses, shrub lands, and some trees. Riparian vegetation provides habitat for fish and wildlife, reduces siltation by trapping sediments, and helps moderate in-water temperatures by providing vegetative shade. Approximately 50% of the County's streams with riparian vegetation are adjacent to agricultural lands.

[2] The estimates of riparian vegetation cover were determined using the DNR stream mapping (Appendix A, Figure 5) and National Landcover Data Set (NLCD; USGS 2011. The comparison is coarse (30 meters) in resolution but accurately distinguishes the low woody riparian vegetation type from the herbaceous crops and sparse, dry, shrub-steppe land covers.

Streams and Riparian Areas on Agricultural Lands[1]	
General locations/ distribution	**Streams:** See Section 2.1 for discussion of water resources within the County **Riparian vegetation:** Located along water resources and mostly within a 20-foot "ribbon of green" from ordinary high water and within irrigation seepages
Intersections with agricultural lands	**Streams:** Primarily within rangelands and dryland agricultural lands adjacent to rangelands **Riparian vegetation**: Primarily within rangelands
Characteristics	**Streams:** • The Columbia River supports more than 40 fish species, including individuals from 14 families of freshwater fishes, and six anadromous species (Chinook salmon, sockeye salmon, Coho salmon, steelhead, and pacific and river lamprey [Anchor QEA 2013]) • Fall Chinook salmon are known to spawn within the Grant County reach of the Columbia River, while other anadromous species rely on the river as a migration corridor • Lower Crab, Sand Hollow, and Trinidad Creeks support anadromous fish, including fall Chinook salmon (Lower Crab) and summer steelhead (all three streams) (Anchor QEA 2013) **Riparian Vegetation:** • Primarily herbaceous shrub lands comprising sedge and rush species • Can include willows, rose, water birch, black cottonwood, aspen, hawthorn, and service berry (KWA Ecological Sciences 2004)

Note:

1. Although irrigation canals, laterals, and ditches created as a part of the CBP provide fish and wildlife habitat, they are not considered HCAs (RCW 36.70a.030(5)).

3.1.3 Fish and Wildlife Habitat Conservation Areas – Priority Habitats and Species

Characteristics and functions overview: See Section 3.1.2.

Intersections on agricultural lands: Priority Habitats and Species (PHS) mapped areas are the largest critical area found within the County and are found within 10% of agricultural lands when habitat associated with game species such as mule deer, Northwest whitetail deer, or chukar are excluded. Priority game species are mapped in 16% of the County's agricultural lands and these areas largely overlap with other mapped PHS areas (Appendix A, Figure 6). These game species are highly prevalent throughout the County, particularly on and around agricultural lands and adjacent riparian and upland habitats. See Appendix B-4 for a comprehensive list of PHS Washington Department of Fish and Wildlife (WDFW) has identified in the County.

Priority Habitats and Species on Agricultural Lands	
General locations/ distribution	• Consists of mostly mammal habitat (largely game species such as mule deer) and game birds such as chukar along the Columbia River, the Grand Coulee, and near the Potholes Reservoir • Bird habitat, including bald eagles and waterfowl, are concentrated around the Potholes Reservoir • Sage-grouse habitat can be found along the Grand and Moses Coulees
Intersections with agricultural lands	• Primarily occurs within rangelands and dryland agricultural lands, except for the sandhill crane, whose habitat occurs largely within irrigated lands
Characteristics	• Incudes ponds, riparian habitats, and upland habitats, including large amounts of shrub-steppe habitat surrounding the Potholes Reservoir, along Lower Crab Creek, and the Columbia River • Excluding game species habitats that cover large areas of the County, the most prevalent HCA is bird habitat, including approximately 80,000 acres of sage-grouse habitat

Sage-grouse Conservation Efforts

Washington is one of 11 western states with populations of greater sage-grouse, all of which have declined due to habitat loss in recent decades. Once common throughout the shrub-steppe areas of Grant County and eastern Washington, the species now occupies about 8 percent of its historical range. The sage-grouse was state-listed as a threatened species in 1998. WDFW completed a recovery plan in 2004 and has since worked with landowners to enroll thousands of acres in federal conservation programs, tailored to address the needs of the specific property in order to keep working lands working while also providing conservation actions compatible with the federal Sage-grouse Initiative and related conservation programs (WDFW 2015).

3.1.4 Critical Aquifer Recharge Areas

Characteristics and functions overview: CARAs provide protections to public drinking water supplies. CARAs affect groundwater quality and hydrology through groundwater infiltration.

Intersections on agricultural lands: CARAs are found within 2% of the County's total agricultural lands, and these are primarily associated with wellhead protection areas mapped for the public drinking water supply (Appendix A, Figure 7). Other CARAs in the County consist of Group B wells with a wellhead protection plan filed with the Grant County Health District, and areas with high potential for aquifer recharge.

Grant County is within the Columbia Basin Ground Water Management Area whose main goal is to protect groundwater and address groundwater issues. In developing this Work Plan, existing wells used for domestic drinking water were evaluated. Of the 176 public water supply system wells recorded within the County, more than half of them are shallow wells that could be considered domestic supply wells with the highest potential susceptibility to contamination in their CARAs from rural lands addressed in VSP. The remaining public water supply wells in the County are deeper wells, which likely receive their recharge outside of the wellhead protection areas. Consequently, the deeper wells would be considered to have very low susceptibility to contamination from surface activities occurring within Grant County, as recharge occurs outside of the County (EA 2017). As new information becomes available on CARAs in the County, this part of the Work Plan can be updated through the adaptive management activities described in Section 6.

Critical Aquifer Recharge Areas on Agricultural Lands	
General locations/ distribution	• Most are within irrigated agricultural lands close to municipal water supplies; these are concentrated around cities and towns
Intersections with agricultural lands	• Those within incorporated cities and towns are not generally subject to VSP, but any portions extending into agricultural lands of unincorporated Grant County are included
Risks associated with agriculture	• Most are located in areas where potential contaminants on the land surface, such as fuel, pesticide or fertilizer, could potentially infiltrate into public drinking water supplies

3.1.5 Geologically Hazardous Areas (Erosion)

Characteristics and functions overview: This Work Plan addresses only a narrow focus for geologic hazards, related to potential wind and water erosion areas, for maintaining agricultural viability by keeping productive soils in fields used to produce crops, improving water quality, and maintaining habitat. This is different from protecting inherent functions and values of other types of critical areas. Rill and inter-rill erosion potential areas are designated within the County's critical areas code (severe to very severe water erosion potential areas). These erosion potential areas, along with wind erosion hazards, are considered in this Work Plan for soil conservation and to reduce the risk of erosion effects on other functions such as surface water quality, water infiltration into soil to improve groundwater conditions, and soil health. In the developed areas (outside of VSP), GHAs can affect areas where constructing structures may not be suitable due to landslide, earthquake, or other geologic risks.

Intersections on agricultural lands: Severe to very severe water erosion potential areas are designated as erosion hazard areas within the County and are found within 22% of the County's total agricultural lands (Appendix A, Figure 8). In recent years, loss of soils due to water- or irrigation-induced erosion has declined as the result of upgrades in irrigation systems (sprinklers) and overall improvement in irrigation water management. High wind erosion potential areas are found within 38% of the County's agricultural lands (Appendix A, Figure 9). Although wind erosion potential areas are not officially designated as erosion hazard areas within the County's critical areas code, they are still considered within this Work Plan because they pertain to agricultural viability. Soil conservation is a key contributor to agricultural viability in the County.

Erosion Hazard Areas on Agricultural Lands	
General locations/ distribution	• Severe water erosion potential areas are predominantly located along the Columbia River and Lower Crab Creek, as well as near the Grand Coulee. • They are found mostly within dryland and rangeland areas, and on irrigated lands, primarily on rill-irrigated areas. Water erosion can also occur from sprinkler-irrigated lands where water use is not efficiently managed. • Wind erosion areas are mainly found in the central and southern portion of the County and are associated with sandy soils.
Intersections with agricultural lands	• Most severe water erosion potential areas are within dryland and rangelands. • Most wind erosion potential areas are within irrigated and range lands.
Characteristics	• County soils are generally characterized by loess, which are very deep, fertile and highly erodible soils deposited through lake settling or by wind from the post-glacial outwash.

3.1.6 Frequently Flooded Areas

Characteristics and functions overview: FFAs protect public health and safety by providing temporary flood water storage and conveyance. They also provide riparian habitat and other wildlife benefits, and can improve water quality and recharge groundwater. FFAs can affect surface and groundwater quality and hydrology (timing and magnitude of flows, and alluvial aquifer recharge), improve or degrade soil health based on vegetative conditions, and contribute to riparian habitat diversity.

Intersections on agricultural lands: FFAs are found within only 2% of the County's total agricultural lands. FFAs typically overlap or are adjacent to wetlands and some HCAs. The Federal Emergency Management Agency (FEMA) occasionally works with the County to update floodplain mapping. No updates to the mapping are currently underway; any changes to the FEMA maps in the future would be reflected in this Work Plan through the adaptive management process.

Frequently Flooded Areas on Agricultural Lands	
General locations/ distribution	• FFAs occur along waterways and drainages mainly on the Crab Creek, Lower Crab Creek, Dry Creek, and Potholes Reservoir
Intersections with agricultural lands	• The majority occur within rangelands and dryland agricultural lands
Characteristics	• Flooding throughout the County is mainly caused by either heavy snowfall followed by warm temperatures or by high-intensity, short-duration rainfall during winter months (December to February; Grant County 2013) • Flash floods are sometimes seen in the County and can be particularly damaging due to the short warning time (Grant County 2013)

3.2 Community Planning Areas

For the purposes of the Work Plan, the Work Group identified eight community planning areas within the County to help develop a more localized planning approach during implementation of the Work Plan. The community planning areas include: Black Sands, Ephrata, Hartline, Mattawa, Moses Lake, Quincy, Royal Slope, and Warden (Figure 3-1).

A general summary of unique distribution of agricultural activities and habitats within each community are further provided in this section. Appendix B-2 includes more detailed and localized baseline conditions analysis, goals, and objectives for each of the community planning areas. Although the Work Plan and the goals and benchmarks discussed in Section 5 apply County-wide, the County's planning areas will help in applying more localized watershed goals and objectives during implementation. The GCCD will tailor implementation approaches to address priorities within each community planning area.

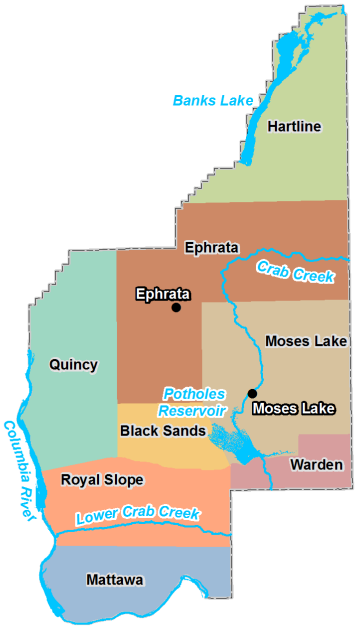


Figure 3-1
Community Planning Areas

Black Sands

Ag Type	Acres
Irrigated	27,004
Dryland	1,559
Rangeland	10,843

The Black Sands Community is unique. The area derives its name from the dark, sandy soils that dominate this area. Local farmers take advantage of shallow wells to feed sprinkler irrigation systems. This makes irrigating the sandy soils possible.

High levels of management yield abundant and quality crops. Close proximity to processing and transportation make this a highly productive area of the Columbia Basin. Two major water wasteways pass through this area and deliver return flows to the Potholes Reservoir for reuse in southern portions of the project. Maintaining surface water and groundwater quality is a high priority.

Most of the Black Sands region provides ideal mule deer habitat, including the area inside the Desert Wildlife Area and large patches of uncultivated land to the west of Pothole Reservoir. Additionally, shorebirds, waterfowl, bald eagles, and great blue heron use the portion of the Pothole Reservoir. The Black Sands region also has a high concentration of shrub-steppe habitat associated with the Desert Wildlife Area and large patches of uncultivated land within the region.

Ephrata

Ag Type	Acres
Irrigated	79,249
Dryland	87,774
Rangeland	4,158,771

The Ephrata Community has three towns within its boundaries—Ephrata (the county seat), Soap Lake, and Wilson Creek. There are numerous orchards in this area, and primary crops grown here are hay, and small grains, which mostly use water delivered by the CBP west canal.

Upper Crab Creek is one of the few naturally occurring perennial streams in Central Washington. Crab Creek runs southwest through the County and has been significantly influenced by the delivery system for the CBP. Prior to implementation of the CBP, Upper Crab Creek was often dry by mid-summer. It remains an intermittent stream under current conditions.

The Ephrata Community has a diverse range of species and habitats. Mule deer can be found here year-round, utilizing shrub-steep habitat, as well as grain and alfalfa fields. Eagles, waterfowl, and shorebirds use a variety of lakes and upland areas throughout the region for breeding and rearing.

Hartline

Ag Type	Acres
Irrigated	8,978
Dryland	113,116
Rangeland	55,187

The Hartline Community has several local communities within its boundaries—Coulee City, Coulee Dam, Electric City, Krupp, and Wilson Creek. Due to low precipitation, the primary agricultural crop is dryland winter wheat. The nature of dryland farming makes it susceptible to erosion, especially from wind erosion. Because healthy topsoil is critical to sustainable dryland agriculture, its preservation is generally considered the most important long-term goal of a dryland farming operation.

The Hartline region is home to a variety of wildlife and native plants. The primary bird species using the area are eagles, shorebirds, songbirds, upland birds, and waterfowl. Mule deer are the primary mammal found in this region and are concentrated along the western border. Additionally, patches of shrub-steppe habitat can be found throughout the Hartline region.

Mattawa

Ag Type	Acres
Irrigated	42,410
Dryland	3,919
Rangeland	10,565

The Mattawa Community includes local communities of Mattawa and Desert Aire. The CBP delivers water to hay, orchards, fruit trees, and potatoes. Mattawa is one of the first areas in the Columbia Basin to see the beginning of large corporate farms. Saddle Mountain lies to the north and is home to large rangeland ranches.

The Hanford Reach National Monument/Saddle Mountain Refuge runs 18 miles along the Columbia river on the west and south boundary of the Community.

The Mattawa Community is home to a variety of wildlife species and habitats, many of which are located along the Columbia River, including bald eagle, great blue heron, red-necked pheasant, sandhill crane, and others. In the upland environment, waterfowl concentrations can be found around small lakes and canals. Shrub-steppe habitat is located mainly along the Columbia River, with some small patches scattered throughout the region.

Moses Lake

Ag Type	Acres
Irrigated	101,431
Dryland	47,104
Rangeland	69,622

The Moses Lake Community has one town within its boundaries—Moses Lake. CBP water is used to assist in the growing of agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of inadequate rainfall. A variety of irrigated crops are grown, with hay being one of the top production crops.

Moses Lake is known for recreation and fishing. Four miles south of Moses Lake is more than 3,000 acres of rolling sand dunes. Manufacturing is prominent in the Moses Lake economy, most notably durable goods manufacturing.

The Moses Lake Community is home to a variety of wildlife and native plants, many of which utilize the areas surrounding the Potholes Reservoir and Moses Lake. Many of the smaller lakes in the region support pheasant and waterfowl concentrations. Shrub-steppe habitat is located throughout the region, with a large patch located to the north of Pothole Reservoir.

Quincy

Ag Type	Acres
Irrigated	100,846
Dryland	37,881
Rangeland	51,052

The Quincy Community has one town within its boundary—Quincy. The soil and climatic conditions in this unit are favorable to the growth of more than 60 different crops annually, including alfalfa, wheat, soybeans, mint, potatoes, sweet corn, grain corn, apples, cherries, peaches, apricots, oats, barley, wine grapes, beans, sugar beets, carrots, squash, watermelon, and other specialty crops. Dairy farming and beef production are also significant in the area. Quincy is also home to large agricultural processing facilities, which process many types of food such as french fries.

Wetlands within the project area are used by numerous migratory bird species. Much habitat in the Quincy unit is concentrated along the Columbia River, including mule deer, chukar, common loon, sage-grouse, and waterfowl. Shrub-steppe habitat is concentrated along the Columbia River in the southwest corner of the unit. Additionally, Quincy supports excellent hunting with pheasant, a favorite upland game bird, stocked throughout the Quincy Wildlife Area.

Royal Slope

Ag Type	Acres
Irrigated	92,039
Dryland	14,155
Rangeland	35,289

The Royal Slope Community has one town within its boundary—Royal City. This community is well known for producing a wide variety of crops, including apples, cherries, peaches, timothy and alfalfa hay, melons, potatoes, onions, wine grapes, pears, mint, and corn. The CBP west canal delivers water for irrigation.

The Royal City Community is home to many bird species and is an excellent example of how agriculture and wildlife can co-exist. The area is renowned for viewing migratory sandhill cranes, which feed on aftermath from harvested fields before they migrate in the fall. Most species habitat in the Royal City Community are concentrated around Lower Crab Creek, which provides cliff and bluff habitat.

There is also a diverse range of species that use habitat along the Columbia River, including waterfowl, shorebirds, common loon, mule deer, amphibians, and reptiles. Shrub-steppe habitat is found along Lower Crab Creek and the Columbia River.

Warden

Ag Type	Acres
Irrigated	25,824
Dryland	11,448
Rangeland	9,402

The Warden Community has one town within its boundaries—Warden. Crops grown in the Warden area include potatoes, grapes, feed corn, wheat, peas, alfalfa, seed crops, and beans.

A major water drainage way in the Warden Community is the Lind Coulee. In the past, irrigation-induced erosion on rill-irrigated row-crop fields was a source of significant sedimentation entering the Lind Coulee, which discharges into the Potholes Reservoir. In recent years, the development and implementation of stewardship practices have made significant improvements in water quality in Lind Coulee.

Much of the western part of the Warden Community is covered by the Columbia National Wildlife Refuge and is home to many species including, mule deer, waterfowl, and upland birds. Additionally, patches of shrub-steppe habitat can be found throughout the Warden region.

3.3 Agricultural Viability Baseline Conditions

Agriculture is widely recognized as a pillar of Washington State's and Grant County's economies. The VSP law is explicit that critical areas are to be protected while, "maintaining and improving the long-term viability of agriculture" (RCW 36.70A.700). Both objectives, critical areas protection, and maintaining agricultural viability have to be met in this Work Plan.

Agricultural viability in the County includes regional and individual farm elements. These are defined, respectively, as the region's ability to sustain agricultural production over time and an individual farm's ability to meet financial obligations and make a profit. Tables 3-3 and 3-4 identify agricultural viability concepts for the regional and individual farm perspectives within the County.

At the regional level, agricultural viability is the support system that helps individual farms to succeed. This system also helps to mitigate potential threats and supports local producers in their operations and ability to take advantage of business opportunities.

Table 3-3
Agricultural Viability – Regional Elements

Regional Elements	
Concept	**Detail**
Stable and secure agricultural land base	Land conversion
	Stable water rights
Infrastructure and services	Utilities/irrigation
	Market access/transportation
Support for best farm management practices	Economically viable solutions
	Balanced approach
Education, training, and succession planning	Apprenticeships/training
	Interconnectivity with end users
Welcoming business environment	Stable regulatory environment
	Partnership-based environmental protection
Market trends/viability	Changing livestock and commodity prices can affect the number of producers that support economy
	Value added measures to make products more marketable

At the farm level, agricultural viability rests mostly on the productivity of the land and the ability of the operator to balance input costs with sales and market pressures (Table 3-4). Due to the presence of irrigation water, Grant County has a large variety of agricultural products and practices. Therefore, there is not one universal agricultural viability concern. In this Work Plan, emphasis is placed on implementing stewardship and conservation measures through a systematic approach that maximizes dual benefits of protecting and enhancing critical areas while enhancing agricultural viability. These systems are a suite of farming practices, applied by crop type, that target multiple agricultural viability concerns, including water, nutrient, pest, and residue management. In combination, practices that maximize benefits and synergies through a systematic approach are expected to have the most benefit for critical areas and agricultural viability.

Another important aspect of agricultural viability is the importance of operating and maintaining existing stewardship practices/systems to achieve long-term benefits and minimize recidivism, or practices that are discontinued over time. The continued operation of existing stewardship practices and systems will be a key component of VSP implementation. New technology is another area that can be explored by agricultural producers to improve the operation of existing stewardship practices and systems or establish new ones. As described in this Work Plan, stewardship practices have the potential to benefit multiple resources, including agricultural practices and critical areas.

Table 3-4
Agricultural Viability – Farm Elements

Farm Elements	
Concept	**Detail**
Reduce inputs	Energy (power, fuels)
	Chemicals
	Labor
Maintain/enhance land production capacity	Soil health
	Water systems and moisture management
	Nutrient management
	New technologies
Flexibility to respond to market conditions	Changing land in production
	Individual schedule for implementing farming practices
	Cropping choices
Incentives	Payment for measures
	Tax breaks
Managed farmland conversion	Urban development
	Maintaining resource lands
"No surprises" regulatory environment	CWA, CAA, ESA, and others
	County permitting (drainage and other requirements)
Protect private property rights	Recognizing and respecting rights
Environmental variation	Rainfall, temperature, and other environmental factors can affect agricultural production and activities

Notes:
CAA: Clean Air Act
CWA: Clean Water Act
ESA: Endangered Species Act

Grant County is unique in location, growing climate, and agricultural diversity enabled through irrigation supply from the CBP. These are all important factors in considering agricultural viability. To obtain a firsthand agricultural viability perspective, several producers in the County were interviewed. Figure 3-2 includes a summary of agricultural viability strengths, weaknesses, opportunities, and threats based on responses obtained from these interviews (Dormaier 2016; Krautscheid 2016; Leitz 2016). See Appendix B-5 for a summary of these interviews.

Figure 3-2
Agricultural Viability Strengths, Weaknesses, Opportunities, and Threats

Strengths	Weaknesses
• Reliable water source from the Columbia River • Reliable climate (dry fall weather) • Strong infrastructure • Transportation access (air, rail, interstate) • High-speed Internet access • Abundant, cheap electricity • Diverse agricultural support industry	• Reliance on export of products • Incentivizing younger generations to farm • High land prices • Distance from large market centers • Little control over the price of commodities • High purchasing costs for new technologies • Costs associated continued operation and maintenance of stewardship practices and systems
Opportunities	**Threats**
• Agricultural processing facilities closer to producers • Expanding into the vegetable market • Vertical integration of individual farms • Education opportunities for new ideas • New technologies such as precision agriculture • Big Bend Community College • Eco Marketing	• Loss of small-size producers • High capitol producers coming from California • Land conversion and rising land prices • Groundwater shortage

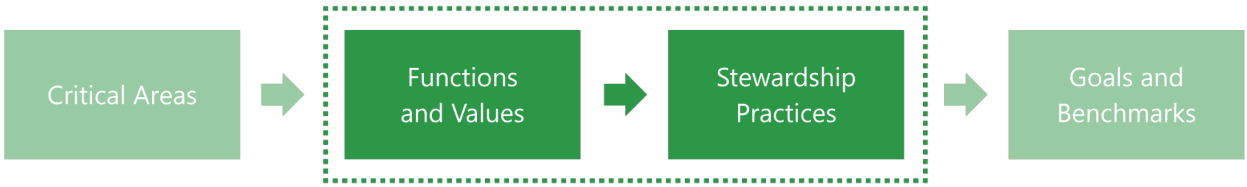
Overall, the Work Plan has been designed to support and promote the regional and individual farm agricultural viability elements listed above. The program places emphasis on systems, practices, flexibility, incentives, and other opportunities mutually beneficial to agricultural viability and critical areas protections, supporting continued agricultural viability in the County. Agricultural viability is a component of stewardship activities described in Section 4 and in each of the goals provided in Section 5. Protecting and enhancing agricultural viability will continue to be a key performance measure that must be met during plan implementation.

4 Protection and Enhancement Strategies

Agricultural producers play a major role in the stewardship and management of private lands and resources within Washington State and Grant County. Agricultural producers are continually improving agricultural practices, applying new science and technology, and implementing stewardship practices that reduce agricultural impacts on critical areas, as well as maintain or increase the viability of the agricultural economy. In Grant County, agricultural producers have adopted a variety of practices to address many of the major resource concerns within the County, including practices to improve irrigation water management, habitat, reduce soil erosion, and improve soil quality.

This section introduces the connection between stewardship practices and critical area functions and values (Figure 4-1). Additionally, this section discusses the stewardship strategies and practices that have been implemented since 2011, highlighting the protections to critical areas and associated function and values these practices are already providing.

Figure 4-1
VSP Crosswalk – Functions and Values Connection with Stewardship Practices



4.1 Examples of Stewardship Practices that Protect Critical Areas

As discussed in Section 3, key critical areas functions include water quality, hydrology, soil, and habitat. Many stewardship practices have been adopted within the County that provide a suite of benefits to these critical areas functions, in addition to maintaining the viability of agriculture.

Table 4-1 summarizes some examples of practices that have been applied by agricultural producers in the County under NRCS programs. This table helps illustrate the types of practices that have been or can be implemented to protect critical areas functions. As noted in the table, these examples also address the promotion of agricultural viability.

It is also important to consider implementing a suite of farming practices in order develop an effective conservation system on a farm. For example, application of irrigation water management practices would realize the most benefit for critical areas protections and agricultural viability by implementing with nutrient and pest management. The GCCD is available to provide technical guidance in identifying farming practices that promote agricultural viability and further the goals of this Work Plan to protect critical area functions.

The VSP Checklist has been developed for agricultural producers and the GCCD to determine how the VSP could apply to their operations. Appendix C provides a more comprehensive "toolbox" of example practices that have been or could be implemented by agricultural producers within the County.

VSP Checklist

The VSP Checklist is a helpful tool to help assess how the VSP could support individual agricultural producers. It includes additional examples of stewardship strategies and practices that protect and enhance critical areas and promote agricultural viability.

Residue and Tillage Management

A beneficial and cost-effective method of reducing soil erosion is through crop residue and tillage management practices such as mulch till, no-till/strip till/direct seed, and ridge till. Monitoring conducted as part of the Farmed Smart Partnership indicated the application of these practices can dramatically reduce erosion when compared to conventional practices (Pacific Northwest Direct Seed Association 2017).

Participation in Funded Programs

Federal, state, and local government, and private-sector programs and opportunities are available to support producers in addressing agricultural and resource concerns. See Section 6 for additional resources and technical assistance available to agricultural producers on a voluntary basis. **Participation in a government-funded program is not required to be a VSP participant.**

Table 4-1
Examples of Critical Areas Stewardship Practices in Grant County (Implemented Under NRCS)

Example Practice	Applicability	Description	Critical Area Functions[1]		Agricultural Viability
Irrigation Water Management	Irrigated	Managing water volume, frequency, and application rate for efficiency	Water Quality	• Reduces runoff and erosion • Reduces transport of nutrients and sediment	• Soil quality • Yield and fertility • Reduced inputs
			Hydrology	• Reduces degradation of surface and groundwater resources	
			Soil	• Manages leaching of salt and chemicals below the root zone	
Residue and Tillage Management	Dryland Irrigated	Managing crop and plant residue and limiting soil disturbance (e.g., no-till or reduced-till)	Water Quality	• Reduces runoff and erosion • Reduces transport of nutrients and sediment	• Soil quality and conservation • Weed management • Yield and fertility
			Hydrology	• Increases infiltration and decreases evapotranspiration to increase water availability	
			Soil	• Reduces soil disturbance and increases cover to reduce wind and water erosion	
			Habitat	• Provides food and cover for wildlife • Increases water availability	
Nutrient Management	Dryland Irrigated	Managing application of nutrients to minimize loss to runoff	Water Quality	• Reduces nutrients in surface and groundwater due to matching plant needs to the amount, timing, and placement of nutrients	• Soil quality • Yield and fertility • Reduced input costs
			Habitat	• Optimizes health and vigor of desired plant species • Increases food and cover for wildlife	
Prescribed Grazing	Rangeland Irrigated	Managing grazing and vegetation harvest to improve plant communities and manage weeds	Water Quality	• Reduces runoff and erosion • Reduces transport of nutrients and sediment	• Soil quality and conservation • Weed management • Yield and fertility
			Hydrology	• Increases infiltration and water availability	
			Soil	• Decreases water and wind erosion due to increased vegetation cover • Reduces stream erosion through enhanced riparian vegetation	
			Habitat	• Improves and maintains health and vigor of desired plant species • Restores desired habitats, such as shrub-steppe	

Note:

1. As defined by the Conservation Practices Physical Effects (CPPE) matrix for each practice. See Section 5.2 and Table 5-6 for additional discussion and details on how practices provide benefits to these critical area functions, based on the NRCS CPPE scores.

4.2 Changes Since 2011 Baseline

Since 2011, agricultural producers have implemented practices that provide protections and enhancements to critical areas and promote agricultural viability through private projects, and projects funded by federal, state, and local governments. One of the key purposes of the VSP and this Work Plan is to leverage existing resources by relying on existing local planning efforts, existing private-sector activities, and government programs to achieve Work Plan goals (RCW 36.70A.700(2)(d)).

The following subsections summarize documented stewardship practices, implemented since 2011, that have likely protected or enhanced critical areas and improved agricultural viability over baseline conditions.

These documented practices likely represent only a subset of all the stewardship practices that have been implemented since 2011, because many agricultural producers in the County implement practices independent of government programs. Accounting for these improvements would require extensive self-reporting and documentation processes that are not yet in place. Additionally, it should be acknowledged that, during this same time, there are likely some practices that have been discontinued. The re-establishment of agriculture in lands managed in conservation can result in habitat and other functions being affected.

It is expected that most implemented stewardship practices, such as irrigation management systems stock watering facilities, and fencing, will see very little to no relapse back to old practices. Less than 3% per year of these types of practices are anticipated to be removed or discontinued each year. There are other stewardship practices (such as pest and nutrient management, residue management, direct seed, and prescribed grazing) where a higher rate of discontinuation (6%) or more variability year to year in implementation is anticipated. See Table 4-2 for assumptions related to varying estimated disenrollment rates.

Direct Seed Equipment Investment

Table 4-2
Calculating Disenrollment for Stewardship Practices

Assumed Range of Disenrollment/ Discontinuation	Stewardship Practice Category	Example Practices
None	**Easements and Infrastructure** • Permanent Stewardship Practices	• Permanent Easements • Major Infrastructure
Lower 0-3%	**Conservation Investments** • High Barriers to Entry/Exit - Conservation Investments - Maintenance Cost - Effectiveness • Increases Land Productivity • Lowers Cost	• Tillage Management • Pest Management • Nutrient Management • Irrigation Management • Fencing
Higher 0-6%	**Conservation Actions** • Low Barriers to Entry/Exit - Easily Removed • Reduced Land in Production • Rotational Use - Market Driven Rotation • Reliance on Unstable Conservation Funding or Incentives (e.g., CRP)	• Habitat Restoration • Prescribed Grazing • Cover Crop • Range Planting

Other programs may also see a higher rate of discontinuation with the expiration of long-term government contracts that manage wildlife habitat, such as the Conservation Reserve Program (CRP), that temporarily enhance wildlife habitat, but this will occur on agricultural lands historically cultivated and not part of designated critical areas. Measures and systems are typically put in place when lands are returned to production to conserve resources and protect potentially affected critical areas adjacent to lands no longer enrolled in CRP (see Section 4.2.3 for additional CRP information).

4.2.1 NRCS Conservation Practices

Conservation projects have been implemented on close to 242,000 acres since 2011 through the NRCS-funded programs on agricultural lands. The top practices that have been implemented include:

- Nutrient, pesticide, and irrigation water management systems to protect water quality and conserve resources
- Residue, and tillage management systems to control erosion, conserve energy, promote air quality and soil functions
- Prescribed grazing to improve vegetation management, manage weeds, reduce erosion and improve soil functions

As summarized previously in Table 4-1, these practices also promote agricultural viability.

Figure 4-2 provides a summary of top NRCS practices implemented under the Environmental Quality Improvement Program (EQIP), Wildlife Habitat Improvement Program (WHIP), and Agricultural Water Enhancement Program (AWEP) for number of projects and acreages—a total of approximately 84,000 acres. As previously noted, these practices and programs only represent a portion of all the practices being implemented but that are currently unaccounted for in the County. VSP definitions control whether a conservation practice or project qualifies as a protection or an enhancement under the VSP. Under the VSP definitions "enhance…means to improve the processes, structure, and functions existing, as of July 22, 2011…" and "protect…means to prevent the degradation of functions and values existing as of July 22, 2011 (RCW 36.70A.703). Because most conservation practices or projects installed since 2011 were designed to improve functions they should generally be counted as enhancement.

Figure 4-2
Top NRCS Conservation Enhancement Practices Implemented from 2011 to 2016

Conservation Practice[1]	Acres Affected	Projects Implemented	Agricultural Activity
Prescribed Grazing	23,202 acres	8	R
Pest Management	18,265 acres	80	D I R
Nutrient Management	14,867 acres	82	D I
Irrigation Water Management[2]	14,777 acres	129	I
Residue and Tillage Management (reduced- and no-till)	4,553 acres	27	D I
Cover Crop	2,006 acres	27	D I R
Conservation Crop Rotation	1,343 acres	9	D I R
Mulching	1,020 acres	32	D I
Wildlife Habitat Management[3]	764 acres	112	D I R
Conservation Cover	414 acres	12	D I R
Irrigation Infrastructure (pumping plants and irrigation pipelines)[4]	N/A	119	I
Stock Watering[5]	N/A	12	R

1,000 Acres 100 Acres D Dryland Crops I Irrigated Crops R Rangeland

Notes:

1. Includes projects implemented under the Environmental Quality Improvement Program, Wildlife Habitat Improvement Program, and Agricultural Water Enhancement Program.
2. Includes irrigation water management (68 projects), sprinkler systems (31 projects), and micro-irrigation systems (30 projects).

3. Includes practices associated with restoration and management of rare and declining habitats, upland wildlife habitat management, and tree/shrub establishment.
4. Includes irrigation infrastructure systems, including pumping plants (72 projects), irrigation pipelines (29 projects), and water control structures (18 projects).
5. Includes watering facilities, livestock pipelines, and water wells.

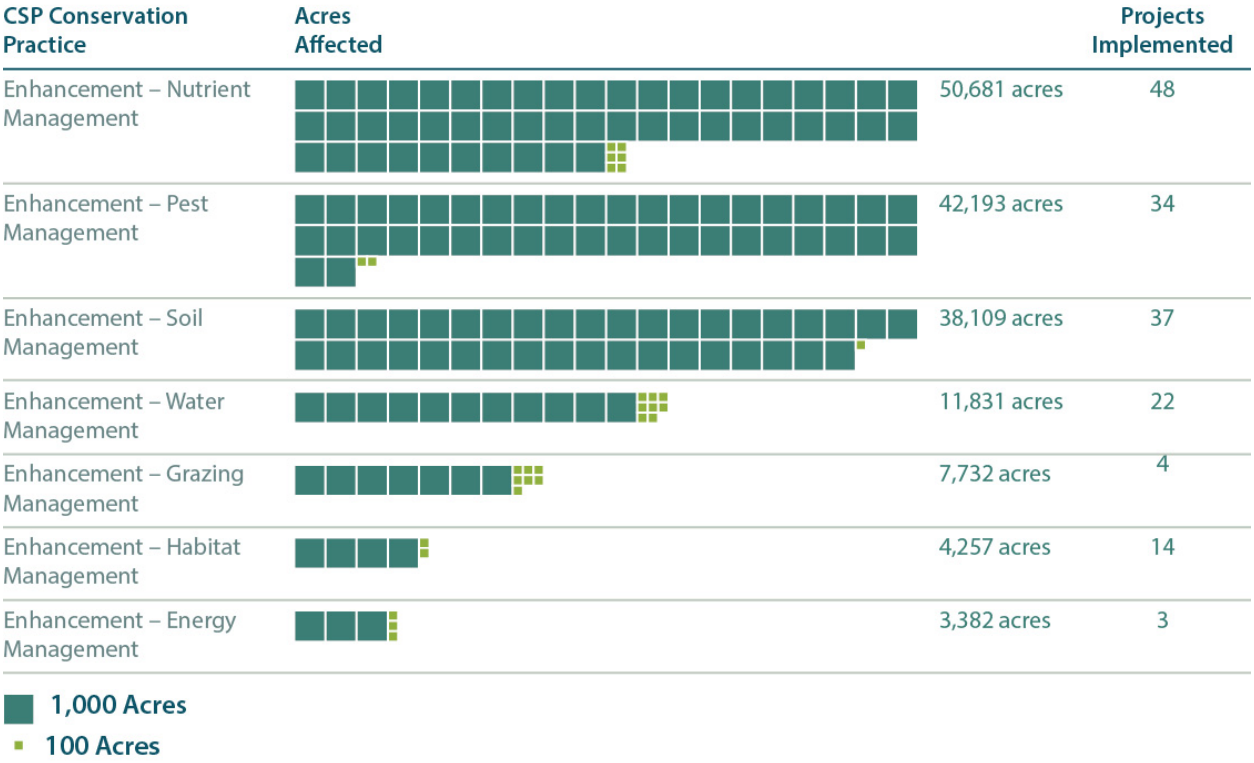
NA: Not applicable
NRCS: Natural Resources Conservation Service
Source: NRCS data provided by Harold Crose with the Grant County Conservation District

NRCS Practices Related to Energy Management

A total of 54 energy-management NRCS practices, including energy-management plans, have been administered in Grant County from 2011 to 2016. These practices are intended to provide cost-effective conservation measures that reduce energy usage and/or increase energy efficiency in farm operations.

Figure 4-3 summarizes enhancement projects implemented under NRCS's Conservation Stewardship Program (CSP), which provides additional incentives for producers to enhance existing practices by providing funding to actively manage, maintain, and expand existing conservation practices. Since 2011, CSP practices have been applied to approximately 158,000 acres, primarily enhancing pest-, nutrient-, and soil-management practices, and enhancing efforts to protect water quality, soil, and habitat. Stewardship enhancements under CSP can be reviewed during implementation to assess the level of enhancements that could be accounted toward the Work Plan's goals and benchmarks.

Figure 4-3
NRCS Enhancement Practices Implemented Under CSP from 2011 to 2016



Notes:
CSP: Conservation Stewardship Program
NRCS: Natural Resources Conservation Service

In addition to practices currently implemented under EQIP, WHIP, AWEP, and CSP, many agricultural producers farming highly erodible lands (HEL) must maintain a conservation system of practices that manages soil erosion in order to secure farming incentives under the Farm Service Agency (FSA) or NRCS.

Highly Erodible Lands
Highly erodible land (HEL) cropland is land with potential to exceed soil erosion standards. Many producers in the County currently have HEL plans for agricultural activities on identified fields. HEL plans include a suite of conservation practices that, when implemented, meet erosion standards.

4.2.2 Conservation District-led Projects

Numerous other projects have also been implemented through the GCCD and are often funded directly by the GCCD or through programs administered by other agencies. The GCCD focuses on providing technical and financial assistance to dairies developing and implementing waste management systems in Grant County. The GCCD also routinely works with producers through NRCS

programs or other measures to develop farm conservation plans that are aimed at promoting agricultural viability and protecting and/or enhancing critical areas functions.

4.2.3 Conservation Reserve Program

The CRP is a federally funded program, managed by the FSA, that pays a yearly rental payment in exchange for farmers removing environmentally sensitive land from agricultural production and planting species that will improve environmental quality. Acres enrolled in CRP vary year to year, depending on the availability of federal funding, which has decreased in recent years. However, these lands are not designated as critical areas. Habitat benefits from CRP lands are considered enhancement under VSP and, if put back into production, are accounted for under baseline conditions. Acreages enrolled in CRP decreased by approximately 6,000 acres between 2011 (79,000 acres) to 2015 (73,000 acres; USDA 2016).

4.2.4 Other Programs

Additional programs, entities, and agencies that support farmers in implementing stewardship strategies and practices are further described in Section 6.4. Technical assistance and stewardship programs and incentives are also provided through Ecology, WDFW, and WSCC through private lands programs and assistance, such as the Farmed Smart Partnership and Aquatic Land Enhancement Account (ALEA).

4.2.5 Changes in Agricultural Landcover since 2011

Between 2011 and 2015, agricultural landcover increased by approximately 2,500 acres (primarily in irrigated lands) based on WSDA agricultural landcover data (WSDA 2011, 2015). This amounts to a gain of approximately 0.2% during a 4-year period, and some of these acres could be attributed to market conditions, the natural variations that occurs in the management of rangelands year to year, or variations in surveying methods applied to development landcover data.

Table 4-3 provides a summary of change analysis in agricultural landcover between 2011 and 2015. This summary table indicates that changes in agricultural landcover are occurring within dryland and irrigated lands. The acreages removed from dryland agriculture are shown as gains in irrigated lands, resulting from water efficiency improvements.

Table 4-3
Agricultural Landcover Change Analysis from 2011 to 2015

Year	Agricultural Landcover Acres (Private)				
	Non-Agricultural	Dryland	Irrigated	Rangeland	Total in Agricultural Land
2011	34,708	317,018	477,784	400,760	1,195,562
2015	34,749	304,109	490,697	402,030	1,196,837
Change since 2011	**40**	**-12,909**	**12,914**	**1,271**	**1,275**

Odessa Groundwater Replacement Project

The Odessa Groundwater Replacement Project has the potential to supply 164,000 acre-feet of surface water from Banks Lake to irrigate 70,000 acres of land currently irrigated with groundwater in the Odessa subarea. This project has the potential to affect agricultural land coverage with the County portions of the Odessa subarea, which include the area east of the East Low Canal and south of Billy Clapp Lake. The Office of the Columbia River and the U.S. Bureau of Reclamation are in the process of constructing the infrastructure needed to bring the water to the Columbia Basin irrigation districts (Ecology 2016b).

The conversion of 14,000 acres of dryland agriculture to irrigated agriculture could have significant effects on critical area functions and values. The conversion to irrigation has the potential to alter soil structure and chemistry, change run-off rates, alter the movement of sediments and nutrients, and alter the rate of application of inputs, including herbicides, pesticides, and fertilizers. Many of these changes could benefit critical areas, by increasing water available for streams and wetlands, and increasing forage for wildlife. Other changes may be detrimental to critical areas functions, including increased use of herbicides and pesticides, and greater nutrient loading of downstream waterbodies.

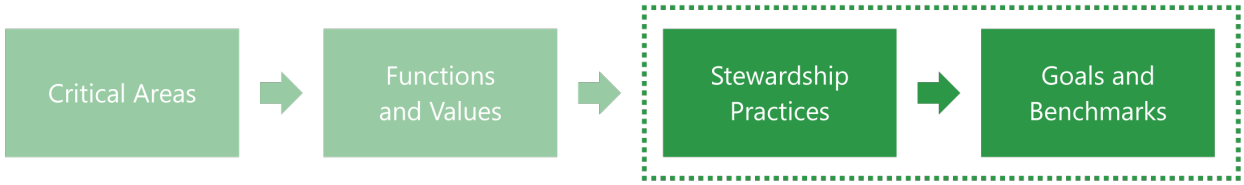
5 Goals, Benchmarks, and Adaptive Management

RCW 36.70A.720(1) requires this Work Plan include goals and benchmarks for the protection and enhancement of critical areas. The benchmarks must be measurable and designed to result in the protection of critical area functions and values and the enhancement of critical areas functions and values through voluntary, incentive-based measures.

This section of the Work Plan identifies:

- **Goals** for protecting and enhancing the County's critical areas, and the four associated major critical areas functions and values: 1) water quality; 2) hydrology; 3) soil; and 4) fish and wildlife habitat. See Section 2.3 for additional discussion on these four major functions and their relationship to the five types of critical areas.
- **Measurable benchmarks** for protection and enhancement of critical areas based on participation in key stewardship strategies and practices. See Section 4 for additional discussion on the connection between stewardship strategies and critical areas functions. Section 5.2 further discusses the methods used to identify functional effects of stewardship strategies and practices.
- **Indicators** for measurable metrics that can be analyzed over time to help assess whether anticipated protection and enhancement of critical area functions are occurring, and focus technical assistance efforts where needed.
- **Monitoring and adaptive management plan** to adjust the Work Plan's benchmarks and activities based on performance results and review of indicators analyzed through monitoring efforts.

Figure 5-1
VSP Crosswalk – Stewardship Practices Connection with Goals and Benchmarks



5.1 Goals

The VSP law requires VSP Work Plans include measurable benchmarks for the protection and enhancement of critical area functions and values, along with goals for participation by agricultural operators (RCW 36.70A.720 (1)(c)) to meet these benchmarks. Additionally, Work Plans are required to incorporate applicable data and plans into development of Work Plan goals and benchmarks (RCW 36.70A.720 (1)(a)). This section identifies the following elements in support of RCW 36.70A.720 (1)(a) and (c); and Section 5.2 includes measurable benchmarks:

- **Goals:** Participation goals are defined for the protection and enhancement of the County's critical areas and key functions.
- **Agricultural viability:** The ancillary benefits to agricultural production, profitability, and sustainability are also noted for each goal, as well as when financial assistance may be necessary to offset costs associated with implementing stewardship practices, including the purchase of associated equipment or other costs.
- **Objectives:** Objectives are identified for each goal to help define specific applications that further each goal. To accomplish these objectives, agricultural producers can implement the stewardship practices that are applicable to their land, agriculturally viable, and protect and/or enhance the critical area functions.
- **Key stewardship practices:** Example stewardship practices are tied to each objective; however, it is acknowledged other practices, including those administered outside of established government programs, can also help meet the objectives. Additionally, it is understood that new practices may emerge, and existing practices may be phased out during implementation of this Work Plan. Selection of example stewardship practices for each objective are based upon Conservation Practice Physical Effect (CPPE) scores for each practice (Appendix C).
- **Existing plans:** Existing plans are also referenced where applicable to identified goals. See Appendix D for additional discussion on review of applicable data and plans as a part of the process for establishing measurable benchmarks and associated indicators. Due to the altered hydrology within the County from the CBP, there are limited watershed or subbasin management plans within Grant County.

Table 5-1
Wetland Protection and Enhancement Goals

Goal #1: Protect and/or enhance wetland functions.

Protection and enhancement: Special emphasis on key functions provided by wetlands.

Key Functions	Wetland Functions
Water Quality	• Reduces siltation and erosion • Provides water filtration • Moderates water temperature
Hydrology	• Stores water to reduce flooding and contributes to base flows
Habitat	• Provides aquatic and woody vegetated habitat for fish and wildlife

Agricultural viability: This goal will be achieved while sustaining agriculture viability through:

- Ancillary benefits from implemented stewardship practices (improved soil function/soil preservation, weed management, increased pollinators/beneficial organisms, and increased fertility)
- Reducing regulation surprises associated with priority habitat degradation and species decline.
- Reducing costs associated with lost ecosystem services (e.g., flood control and water filtration).
- Reducing input costs associated with nutrient, pest, and water management.
- Financial incentives to offset start-up costs for new practices and infrastructure.

Objectives	Key Stewardship Practices	Existing Plans
Protect and voluntarily enhance acres managed using strategies that provide direct protections to wetlands and wetland buffers.	• Riparian Herbaceous Cover/ Filter Strips • Conservation Cover • Fencing • Access Control/Heavy Use Protection	
Protect and enhance acres managed using strategies that promote water quality and hydrology functions by reducing erosion and improving water storage and filtration.	• Conservation Crop Rotation • Cover Crop • Mulch Tillage • Direct Seed • Range Planting • Prescribed Grazing	
Protect and enhance acres managed using strategies that promote water quality and aquatic habitat functions by reducing inputs from runoff.	• Irrigation Water • Nutrient Management • Pest Management • Riparian Herbaceous Cover/Filter Strips • Grassed Waterways • Polyacrylamide	

Table 5-2
HCA Protection and Enhancement Goals

Goal #2: Protect and/or enhance fish and wildlife habitat conservation area functions.

Protection and enhancement: Special emphasis on key functions provided by fish and wildlife habitat conservation areas (HCAs).

Key Functions	HCA Functions
Water Quality	• Reduces siltation by stabilization streambanks from riparian vegetation • Provides water filtration • Moderates water temperature by providing shade
Hydrology	• Stores and retains water to reduce flooding and support base flows in streams
Soil	• Reduces rate of erosion by providing vegetative cover
Habitat	• Provides spawning, rearing and migratory habitat for fish, and riparian also provides refuge, nesting, and rearing areas for wildlife • Provides aquatic habitat by supplying organic inputs (e.g., leaf fall, insects, and large wood) • Supports sensitive species lifecycles

Agricultural viability: This goal will be achieved while sustaining agriculture viability through:

- Reducing regulation surprises associated with priority habitat degradation and species decline.
- Ancillary agriculture benefits from implemented practices (soil conservation, weed management, and pollinator/beneficial organism).
- Reducing costs associated with lost ecosystem services (e.g., flood control and water filtration).
- Financial incentives to offset start-up costs for new practices and infrastructure.

Objectives	Key Stewardship Practices	Existing Plans

Protect and/or enhance acres managed using strategies that promote habitat functions by restoring or creating new habitat structures.	• Stream Habitat and Improvement Management
	• Riparian Herbaceous Cover
	• Restoration and Management of Rare and Declining Habitats
	• Tree/Shrub Establishment
	• Conservation Cover
	• Upland Wildlife Habitat Management
	• Range Planting
		• WDFW's Management Recommendations for Washington's Priority Habitats and Species:
		  ○ Greater Sage-grouse
		  ○ Shrub-steppe
		  ○ Riparian
		• WDNR Natural Heritage Program (rare plants and ecosystems)

Protect and/or enhance acres managed using strategies that promote habitat functions by limiting trampling of habitat.	• Prescribed Grazing • Watering Facilities • Fencing • Access Control	

Goal #2: Protect and/or enhance fish and wildlife habitat conservation area functions.		
Protect and/or enhance acres managed using strategies to promote habitat functions by preventing unintentional conversion of shrub-steppe habitat.	• Irrigation Water Management	
Protect and/or enhance acres managed using strategies that promote water quality, hydrology, and soil functions by reducing erosion and improving water storage and filtration.	• Conservation Crop Rotation • Cover Crop • Mulch Tillage • Direct Seed • Range Planting • Prescribed Grazing • Polyacrylamide	
Protect and/or enhance acres managed using strategies that promote water quality and aquatic habitat functions by reducing inputs from runoff (surface water quality).	• Irrigation Water • Nutrient Management • Pest Management • Riparian Herbaceous Cover/Filter Strips • Grassed Waterways	
Protect and/or enhance acres managed using strategies to protect fish-bearing streams (Lower Crab, Sand Hollow, and Trinidad Creeks) and limit shoreline and watercourse degradation and enhance shoreline areas and watercourses.	• Watering facility • Restoration and management of rare and declining habitats • Stream habitat improvement and management • Channel bed stabilization • Riparian Herbaceous Cover • Fish and wildlife structure	Crab Creek Subbasin Plan (KWA Ecological Sciences 2004) Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan (Upper Columbia Salmon Recovery Board 2007)

Table 5-3
CARA Protection and Enhancement Goals

Goal #3: Protect and/or enhance critical aquifer recharge area functions.

Protection and enhancement: Special emphasis on key functions provided by CARAs.

Key Functions	CARA Functions
Water Quality	• Infiltration through soil column and underlying geology improves groundwater quality
Hydrology	• Recharges groundwater resources

Agricultural viability: This goal will be achieved while sustaining agriculture viability through:

- Ancillary agriculture benefits from implemented practices (increased soil, increased soil moisture, weed management, pollinator/beneficial organism, and increased fertility).
- Reducing input costs associated with chemicals.
- Reducing costs associated with irrigation and livestock watering.
- Financial incentives to offset start-up costs for new practices and infrastructure.
- Hazardous materials spill containment and cleanup.

Objectives	Key Stewardship Practices	Existing Plans
Protect and/or enhance acres managed to protect shallow groundwater wells by managing chemical and nutrient input controls.	• Water Management • Nutrient Management • Pest Management	Existing data and plans: • Groundwater Management Area (GWMA) Plans • Grant County CARA and VSP Technical Memorandum (2017)
Protect and/or enhance acres managed to promote natural groundwater filtration functions.	• Conservation Cover • Cover Crop • Mulch Tillage • Direct Seed • Range Planting • Prescribed Grazing	
Protect and/or enhance acres managed to promote hydrology functions by improving water conservation.	• Irrigation Water Management	

Table 5-4
GHA (Erosion Hazard) Protection and Enhancement Goals

Goal #4: Protect and/or enhance geologically hazardous area (erosion hazard) functions.

Protection and enhancement: Special emphasis on key functions provided by geologically hazardous areas (GHAs) for erosion hazards.

Key Functions	GHA Functions
Water Quality	• Rate of soil erosion and associated movement of sediment deposited in surface waterbodies
Hydrology	• Rate of groundwater infiltration and rate of surface water runoff
Soil	• Rate of erosion as it relates to depth
Habitat	• Rate of erosion as it relates to sediment inputs to stream and wetland aquatic habitat

Agricultural viability: This goal will be achieved while sustaining agriculture viability through:

- Preserving land available for agriculture.
- Ancillary agriculture benefits from implemented practices (increased soil moisture, weed management, and pollinator/beneficial organism).
- Reducing costs associated with soil replenishment and flood cleanup.
- Financial incentives to offset start-up costs for new practices and infrastructure.

Objectives	Key Stewardship Practices	Existing Plans
Protect and/or enhance acres managed using strategies that promote water quality, hydrology, soil, and habitat functions by reducing erosion and improving water storage and filtration.	• Conservation Crop Rotation • Cover Crop • Mulch Tillage • Direct Seed • Range Planting • Prescribed Grazing • Polyacrylamide	

Table 5-5
FFA Protection and Enhancement Goals

Goal #5: Protect and/or enhance frequently flooded area (FFA) functions.

Protection and enhancement: Special emphasis on key functions provided by frequently flooded areas (FFAs) for erosion hazards.

Key Functions	FFA Functions
Water Quality	• Vegetation in FFAs holds underlying soil in place and also provides area for new sediment depositions to settle out • Moderates water temperature by shallow groundwater infiltration and releases from unconfined aquifers of cooler groundwater back to streams, and by vegetation that can provide shade
Hydrology	• Stores and retains surface water surface in floodplain, reducing velocities and modifying discharge rates • Recharges groundwater that can later be returned to the stream to help maintain base flow
Soil	• Supports moisture content in soils, reduces rate of erosion, and supports plant growth that can increase organic inputs to soil
Habitat	• Provides aquatic and riparian habitats for wildlife, plants, and fish

Agricultural viability: This goal will be achieved while sustaining agriculture viability through:

- Ancillary agriculture benefits from implemented practices (maximize availability of surface withdrawals for irrigation, flood control benefits/soil preservation, increased soil moisture, weed management, and pollinator/beneficial organism).
- Reducing costs associated with flood management and flood cleanup.
- Financial incentives to offset start-up costs for new practices and infrastructure

Objectives	Key Stewardship Practices	Existing Plans
Protect and/or enhance frequently flooded areas directly	• Riparian Herbaceous Cover • Grassed Waterways • Conservation Cover • Fencing • Access Control/Heavy Use Protection	
Protect and/or enhance acres managed using techniques that limit soil compaction or trampling of habitat	• Prescribed Grazing • Watering Facilities • Fencing • Access Control	

Goal #5: Protect and/or enhance frequently flooded area (FFA) functions.		
Protect and/or enhance acres managed using strategies that promote water quality, hydrology, soil, and habitat functions by reducing erosion and improving water storage and filtration.	• Conservation Crop Rotation • Cover Crop • Mulch Tillage • Direct Seed • Range Planting • Prescribed Grazing • Polyacrylamide	

5.2 Measurable Benchmarks

5.2.1 Methods

This section identifies the measurable benchmarks required by RCW 36.70A.720 (1)(e) for: 1) protection of critical area functions and value; and 2) enhancement critical areas functions and values through voluntary, incentive-based measures. Protection and enhancement benchmarks are based on agricultural producer participation in key stewardship strategies that further the Work Plans goals identified in Section 5.1.

Benchmarks are measured by tracking new and continued implementations of various stewardship practices and associated stewardship on agricultural lands. Over time, the implementation of these stewardship practices will be used to demonstrate that VSP is meeting the protection goals and determine whether or not VSP is achieving the enhancement goals and benchmarks. See Appendix C for initial results based on 2011 to 2016 participation data in key stewardship practices.

The Work Plan includes two measurable benchmarks per RCW 36.70A.720 (1)(e):

- **Protection Benchmarks** (preventing the degradation of baseline functions existing July 22, 2011) – The protection benchmark must be met to continue the voluntary, non-regulatory approach under VSP. For each protection goal, participation benchmarks are also identified and are designed to provide quantifiable measures that will ensure protection of the County's critical area functions and values is being achieved.
- **Enhancement Benchmarks** (enhancements improve baseline critical area functions and values through voluntary and incentive based measures) –Meeting enhancement goals is encouraged, but not required, to continue the voluntary, non-regulatory program under VSP for protecting critical areas. At each 5 year benchmark reporting period, voluntary enhancements of critical area conditions on lands used for agricultural activities are promoted and accounted for. Benchmarks for enhancement are specific to the County and indicate voluntary measures are leading to desired improvements in critical area functions and values. Enhancement also provides a measure of certainty that the VSP protection goal will be met if some unforeseen, future loss of critical area function(s) and/or value(s) occurs.

Benchmark quantities for stewardship practice enrollment are provided in 5-year reporting increments (2021 and 2026). The methods used to establish protection and enhancement benchmark values for stewardship practice participation included:

- **Measuring historical enrollment data** in key stewardship practices to develop an average annual enrollment quantity for each practice.
- **Connecting stewardship practices with specific benchmark goals** based on the CPPE scores for each practice developed by U.S. Department of Agriculture (USDA; NRCS 2017). CPPE scores range between -5 and +5, with positive scores denoting a beneficial effect, and negative scores having an adverse effect. USDA CPPE scores were averaged for the four key functions, adjusted to include scoring criteria applicable to Grant County. See Appendix C for details on how averaged CPPE scores were developed for Grant County. The CPPE scoring is an interim step in determining whether protection and/or enhancement has occurred compared to the VSP 2011 baseline. Under VSP, the relative changes in functions affected from a given conservation practice will be tracked, e.g., a +4 increase moving to from a -2 to +2, rather than the CPPE score of +2.
- **Setting anticipated disenrollment rate** of agriculture lands that may not continue to maintain the stewardship practice past the required lifespan or following the end of a contract, or for other disenrollment reasons. Disenrollment or abandonment of practices can be monitored to reduce this rate further based on actual data.
- **Setting protection benchmarks and performance objectives** (see Table 5-7) by summing the enrollment goal to maintain baseline practices for protection of critical area function by replacing all lost functions associated with disenrollment or abandonment of practices (acres calculated by anticipated disenrollment rates; see Table 4-2).

2011 Baseline Condition	**=**	**(Newly Enrolled Acres x Physical Effects Score)**	**-**	**(Disenrolled Acres x Physical Effect Score**)

What is Conservation Practice Physical Effect (CPPE)?

The CPPE describes how Natural Resources Conservation Service practices affect human-economic environment (e.g., Agricultural Viability) and natural resources (e.g., Critical Functions). This planning tool provides a quantitative score detailing the magnitude of the practice's effect on the resource. Technical reports for each practice also include a qualitative statement on the impact of each practice on soil, water, air, plants, animals, energy and labor, capital, and risk. A summary of the practices with CPPE scores are provided in Appendix C. The implementation team will use discretion in determining which CPPE best represents the physical effects of stewardship practices on critical areas in the County based on local conditions and practices.

- **Setting enhancement benchmarks and performance objectives** by:
  - Including additional project acres funded for implementation in key practices (2017 to 2027)
  - Including project acres that have implemented between 2011 and 2016 above the protection performance objectives.
  - Enhancement benchmarks and performance objectives are in addition to the protection benchmarks; therefore, estimated disenrollment acres (protection performance objectives value) have been incorporated into the enhancement performance objectives value (see Table 5-7).

Enhancement Performance Objective	=	**(Key Practices to be Installed x Physical Effect Score)** *based on 2017 to 2027 data on funded projects*	+	**(Annual Enrolled Acres** x Physical Effect Score) *based on 2011 to 2016 enrollment data*	-	**Protection Performance Objective**

Rapid Watershed Assessments

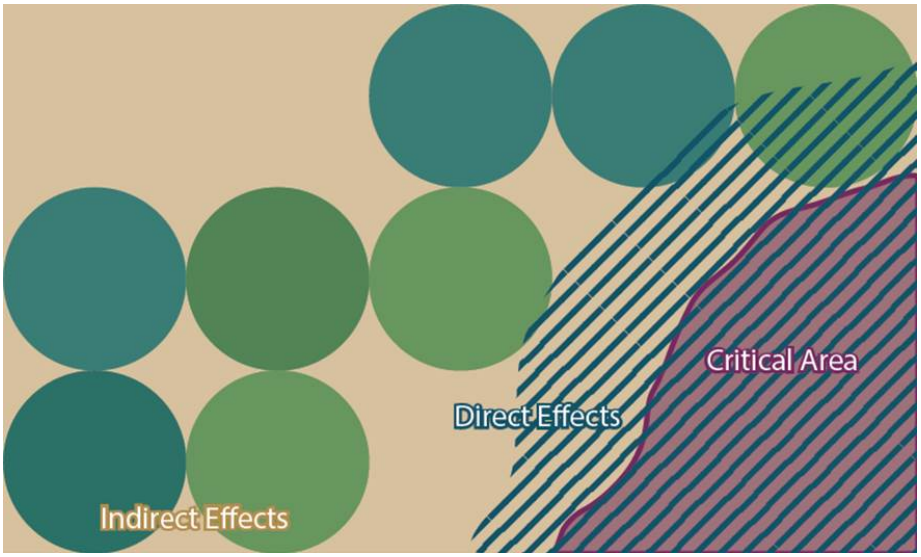
The GCCD has developed planning matrices (for each community planning area) that identify:

- Resource concerns (e.g. Wind Erosion, Organic Matter Depletion) and locally appropriate stewardship practices to address these concerns
- The anticipated effects of implementing stewardship practices
- Funding mechanisms toward VSP implementation

Planning matrices for each community planning area are provided in Appendix C. These tools provide a valuable mechanism toward implementing the VSP and monitoring its success, as well as providing a localized approached to developing benchmark values.

Stewardship practices can be implemented within or directly adjacent to a critical area (see Figure 5-2 for a conceptual representation). An example of a direct effect would include implementing wetland restoration practices within or adjacent to an existing wetland critical area. Indirect effects occur within agricultural areas that are not adjacent to or within critical areas but still have indirect effects on resource functions.

Figure 5-2
Direct and Indirect Effects of Practices on Critical Area Functions



5.2.2 Benchmarks

Work Plan benchmarks are focused on measuring and tracking producer participation in implementing key stewardship practices identified by the Work Group as having a clear benefit to one or more critical area functions and values.

Table 5-6 provides a crosswalk of the key stewardship practices identified for the Work Plan benchmarks to critical areas, function protections based on the overall averaged CPPE function effects score, and agricultural viability aims. The CPPE scoring shown in Table 5-6 indicates the most beneficial effects (enhancements) to functions in green boxes (+5), no effect (0), and the most detrimental effects to functions in orange (-5). See Appendix C for additional information on methods applied for linking stewardship practices to function protections using CPPE function effects and a more comprehensive list of stewardship practices.

Table 5-7 provides a summary of protection and enhancement measurable participation benchmarks for the 5-year reporting increments (2021 and 2026). In predicting benchmark values for enhancement, GCCD typically assumed 40% implementation would likely occur within the first 5-year reporting timeframe (2021) while VSP implementation and outreach is developed and conducted, and 60% would occur within the second 5-year reporting timeframe (2026). The protection performance standard for each stewardship practice is based on historic records. New practices will often replace an existing practice. Trends in stewardship practices and updates to the protection performance standard that reflect the move to new stewardship practices will be included in the 2 and 5 year reports. Acreages may be adjusted as needed to reflect the higher or lower physical effect of the new practice.

Table 5-6
Key Stewardship Practices Crosswalk to National Functions Scores, Critical Areas, and Agricultural Viability

Key Stewardship Strategies			Critical Area Functions Protection Metrics (averaged CPPE Function Effects Score)[2]				Critical Area Protections					Agricultural Viability Aims
Type	NRCS Code	Key Practices[1]	Soil	Hydrology	Water Quality	F&W Habitat	WET	HAB	CARA	GHA	FFA	
Soil Management	328	Conservation Crop Rotate	3.17	1.60	1.75	2.00	●	●		●		- Protect against erosion risk - Protect soil function - Reduce invasive and nuisance species - Provide pollinator species/beneficial organisms habitat - Promote yield and fertility
	340	Cover Crop	2.46	1.40	1.75	2.00						
	450	Polyacrylamide Application	2.00	1.00	1.17	0.00						
Water Management[3]	449	Irrigation Water Management	1.75	1.50	1.82	0.00	●	●	●	●		- Protect against erosion risk - Protect soil function - Reduce input costs
	442	Sprinkler System	1.25	2.67	1.55	1.00						
Nutrient Management	590	Nutrient Management	0.83	0.00	3.50	0.00	●	●	●			- Protect soil function - Reduce invasive and nuisance species - Reduce input costs
Pest Management	595	Pest Management	2.00	0.00	4.00	2.00	●	●	●	●		- Protect soil function - Reduce invasive and nuisance species - Provide pollinator species/beneficial organisms habitat
Residue and Till Management	345	Residue Management - Mulch Till	2.75	1.33	2.20	1.67	●	●		●		- Protect against erosion risk - Protect soil function - Reduce invasive and nuisance species - Promote yield and fertility
	329	Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed	3.00	0.80	2.00	1.67						
Range Management[4]	550	Range Planting	3.10	0.75	1.33	2.67	●	●		●	●	- Protect against erosion risk - Protect soil function - Reduce invasive and nuisance species - Promote yield and fertility
	528	Prescribed Grazing	2.83	1.50	1.30	2.67						
	614	Watering Facility	1.10	0.00	1.71	4.00						
Habitat Management	327	Conservation Cover	2.77	1.25	2.89	3.33	●	●		●	●	- Protect against erosion risk - Protect soil function - Reduce invasive and nuisance species - Provide pollinator species/beneficial organisms habitat
	395	Stream Habitat Improvement and Management	2.50	0.00	2.00	3.00						
	390	Riparian Herbaceous Cover	2.79	0.33	2.50	3.50						
	612	Tree/Shrub Establishment	3.00	1.20	1.17	2.33						
	643	Restoration and Management of Rare and Declining Habitats	0.50	0.00	2.00	4.00						
	645	Upland Wildlife Habitat Management	1.20	-0.50	2.00	5.00						
	382	Fence	1.00	0.00	2.00	0.00						

Notes:
1. Key practices include those practices that address resource concerns and critical areas function protections; and are widely implemented, anticipated for continued application, or identified as major practice trends anticipated in the future.
2. The NRCS Conservation Practice Physical Effects (CPPE) matrix was relied upon to develop an average function effects scores for the key function and practices. See Appendix C for full suite of stewardship practices CPPE scores.
3. Water management stewardship focuses on key practices that address on-field resource concerns and management where irrigation activities are already occurring. Conveyance infrastructure, such as irrigation pipelines, are not considered in the group of key practices.
4. Livestock management stewardship focuses on key practices that address on-field resource concerns and management. Conveyance infrastructure, such as livestock pipelines, are not considered in the group of key practices.

Table 5-7
Protection and/or Enhancement Benchmarks and Objectives

Stewardship Strategies			Historical Enrollment Data (2011 – 2016)		Protection Benchmarks and Performance Objectives[1, 2]			Enhancement Benchmarks and Performance Objectives[1, 2]		
Type		Key Stewardship Practices[1]	Average Annual Enrollment in Key Practices	Estimated Yearly Disenrollment Acres	Benchmark	2021 Performance Objective (Disenrollment x 10[4])	2026 Performance Objective (Disenrollment x 15[4])	Benchmark	2021 Performance Objective	2026 Performance Objective
Indirect Intersects	Soil Management	• Conservation Crop Rotation • Cover Crop • Polyacrylamides	558 ac	17 ac (3%)	No net loss in acres under soil management	168 ac	251 ac	Enrolled units (e.g., acres and feet) based on: • Implemented projects from 2011 – 2016 • Anticipated projects funded for stewardship practices from 2017 -2027 • Estimated annual disenrollment since 2011 at time of reporting	3,555 ac	4,029 ac
Indirect Intersects	Water Management[5]	• Irrigation Water Management • Sprinkler System	1,846 ac	55 ac (3%)	No net loss in acres under water management	554 ac	831 ac		11,936 ac	13,776 ac
Indirect Intersects	Nutrient Management	• Nutrient Management	2,478 ac	74 ac (3%)	No net loss in acres under nutrient management	743 ac	1,115 ac		17,984 ac	23,402 ac
Indirect Intersects	Pest Management	• Pest Management	3,044 ac	91 ac (3%)	No net loss in acres under pest management	913 ac	1,370 ac		21,046 ac	26,131 ac
Indirect Intersects	Residue and Tillage Management	• Residue and Till Management – Mulch Till • Direct Seed	759 ac	23 ac (3%)	No net loss in acres under residue and tillage management	228 ac	341 ac		1,083 ac	5,243 ac
Indirect Intersects	Range Management[6]	• Range Planting • Prescribed Grazing • Watering Facility	3,897 ac 1 watering facility	117 ac (3%) 0 watering facility (0%)	No net loss in acres under livestock/range management	1,169 ac 0 watering facility	1,754 ac 0 watering facility		26,717 ac 7 watering facility	32,885 ac 8 watering facility
Direct Intersects	Habitat Management	• Conservation Cover • Stream Habitat Improvement and Management • Riparian Herbaceous Cover • Tree/Shrub Establishment • Restoration of Rare and Declining Habitats • Upland Wildlife Habitat Management • Fence	197 ac 67 feet (fence)	12 ac (6%) 2 feet (fence) (3%)	No net loss in acres under habitat management No net loss of feet providing habitat management	118 ac 20 feet (fence)	177 ac 30 feet (fence)		7,331 ac 723 feet (fence)	13,542 ac 1,055 feet (fence)

Notes:

1. Key practices include those practices that address resource concerns and critical areas function protections; and are widely implemented, anticipated for continued application, or identified as major practice trends anticipated in the future.
2. Measurable benchmarks are based upon the historic NRCS participation data (2011-2016) in key practices (see Note 1). No net loss and enhancements will be measured based on estimated annual disenrollment rates for key practices from the 2011 baseline.
3. Benchmarks are anticipated to be adapted as new technologies and practices are applied by producers, and unanticipated changes in environmental and market conditions would be addressed through the adaptive management process. Protection benchmarks are based on estimated disenrollment rates. A more accurate estimate and understanding of which practices are discontinued can be used to modify these benchmarks.
4. Number is years between 2011 and benchmark year.
5. Water management stewardship focuses on key practices that address on-field resource concerns and management where irrigation activities are already occurring. Conveyance infrastructure, such as irrigation pipelines contracted under NRCS (approximately 3,000 feet in 2011 – 2016) are not included in measurable benchmarks.
6. Livestock management stewardship focuses on key practices that address on-field resource concerns and management. Conveyance infrastructure, such as livestock pipelines contracted under NRCS (approximately 4,000 feet in 2011 – 2016) are not included in measurable benchmarks.

ac: acres

5.3 Indicators

Indicators are measurable metrics associated with specific environmental variables, (e.g. nitrate concentrations in a well, or stream flow at a particular location). Metrics can be analyzed over time to understand longer term trends related to specific critical area functions and values. Indicators affected by both agricultural and non-agricultural factors will generally not be used for purposes of determining whether protection of baseline conditions is being achieved or goals and benchmarks are being met due to the cost and difficulty involved in separating agricultural effects from non-agricultural effects. Such indicators may however be used to identify resource trends and focus enhancement efforts on high priority areas. Indicator data will be reviewed at least every 5 years to help focus technical assistance efforts and assess if the anticipated protection and/or enhancement of critical area functions is occurring. If an indicator shows a loss or gain in the baseline condition for a critical area function, it can be compared to the performance objectives for stewardship practices implemented.

If this analysis does not account for the change, a more targeted evaluation and analysis of the specific effects of agricultural activities can be made for the applicable parameter(s). This analysis would be used to inform if the VSP is meeting the protection standard for critical area functions within agricultural areas and the degree to which non-agricultural factors are influencing one or more indicators.

The following indicators relate to the four major critical area functions:

- **Water quality indicators** will include Category 4 and 5 303(d) listings, focused on parameters that potentially have an agricultural source. Category 4 includes polluted waters that do not require a Total Maximum Daily Load (TMDL), and Category 5 waters are polluted and require a TMDL or other water quality improvement project. Appendix B-6 provides a listing of these parameters found in Grant County in 2016, acknowledging these parameters may be updated in the future. 303(d) listings within the County can be monitored using Washington State Department of Ecology's (Ecology) Water Quality tools found here: http://www.ecy.wa.gov/programs/wq/303d/index.html.
- **Hydrology indicators** will include tracking flow gauges through the U.S. Geological Survey (USGS) or other agencies. USGS Water data is available here: https://www2.usgs.gov/water/.
- **Soil function indicators** will include USDA Natural Resources Inventory (NRI) monitoring results related to erosion and soil functions and fertility. This monitoring should focus on locations within or adjacent to critical areas in relation to erosion issues, allowing for more natural erosion rates upland of critical areas. Interactive data viewers at the State level are available here: https://www.nrcs.usda.gov/wps/portal/nrcs/rca/national/technical/nra/rca/ida/.
- **Habitat indicators** will include evaluation of publicly available aerial imagery at the 5 and 10-year performance review periods, based upon adequate resources provided through the

state for VSP program implementation to assess critical area resource protections (primarily HCAs and wetlands). Imagery evaluation will include a random sampling of areas[3] within the Work Plan's community planning areas. Analysis results will be summarized in the reporting at planning area and County scales. Individual parcels will not be identified and producer privacy will be maintained in the evaluation process. Priority habitats and species data available through WDFW will also be evaluated in addition to other related information that might or is expected to become available in the future, such as remote sensing through WDFW's High Resolution Change Detection program or other GIS approaches for habitat assessment, if this information is made available to Grant County. Additionally, ground-truthing will be needed to ensure that change detection data made available fits the scope and jurisdiction of the VSP, and that agricultural activities were actually the cause of any identified degradations. Review of PHS updates and other relevant information comparisons against the 2011 baseline conditions will be done in coordination with WDFW.

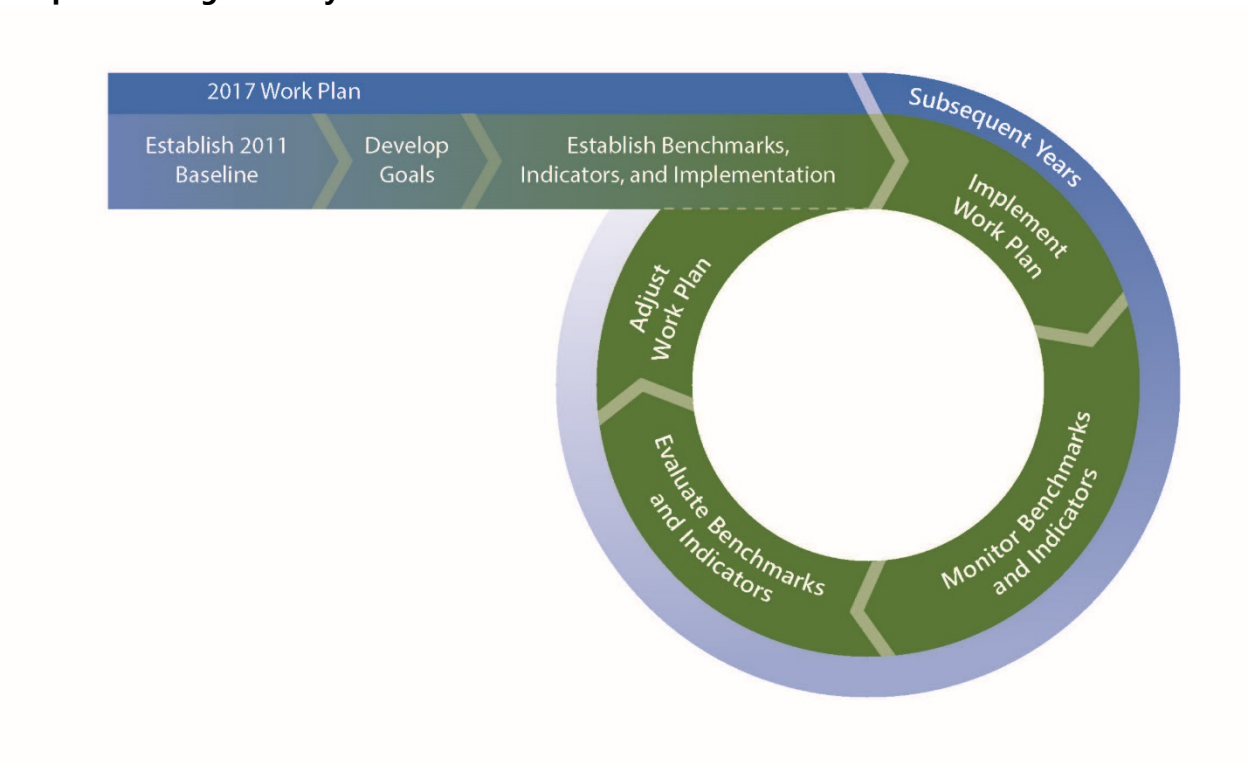
While not determinative of VSP success in maintaining 2011 baseline or better conditions as affected by agricultural activities and conservation practices, participation measures and indicators provide important information for evaluating the Grant County VSP performance and adaptive management actions described in Section 5.4.

[3] Random sample areas will include a representation of lands for VSP participants as well as other lands that may or may not have practices implemented on them, and these results will be extrapolated to the larger community areas and the County, in an effort to more accurately characterize critical areas protections achieved.

5.4 Monitoring and Adaptive Management

Adaptive management typically consists of a monitoring system to identify changes in the environment coupled with a response system to adjust the activities based on performance results and review of indicators information. The adaptive management system would be applied if the performance review in Year 5 of implementation suggests the VSP program may not be protective of critical areas functions existing in 2011. The adaptive management system for the Grant County VSP consists of the following five key sequential elements, as illustrated in Figure 5-3:

Figure 5-3
Adaptive Management System



1. **Assess** – Data on participation goals and the indicators previously described are compiled by GCCD. The compiled information is used to identify issues, refine objectives, and understand if benchmarks are effective in protecting or enhancing critical area functions and values.
2. **Update Benchmarks** – Based on the results of the assessment stage, updates to the protections and enhancement benchmarks could occur. These updates could represent changes to the level of participation necessary to meet a specific protection or enhancement standard. These updates could also reflect a change in the goals for a specific watershed or critical area function.
3. **Implement and Monitor** – The approved work plan is put into action, concurrently with monitoring focused on documenting the protection and enhancement of critical area functions

and values. Monitoring data are collected on various indicators and used to determine if specific functions and values are being protected.

4. **Evaluate** – Participation data are evaluated relative to the protection and enhancement goals. Differences between targeted goals and results are identified, and the causes for those differences are investigated, including consideration of participation measures and indicators. Goal adjustments are made as needed to maintain protection of critical area functions and values.
5. **Adjust** – Information learned in previous steps is used to adjust the participation benchmarks, stewardship practices, or level of incentive for enhancement.

Considering the Changes to Baseline Conditions
It's important to note changes to baseline conditions outside of VSP are likely to occur due to effects from climate change, natural events (e.g., floods, wild fires), the CBP, or other changes outside of the scope of VSP (e.g., land conversions). Additional changes to baseline may occur in the County that are the result of activities outside of the County, such as effects to watercourses that occur upstream and outside of the County limits. These changes will not be counted against agriculture for VSP assessment purposes and will be documented through the reporting and adaptive management process.

The adaptive management process is iterative and would repeat cyclically at least every 5 years, as part of the implementation of the VSP. If an adjustment is identified, the Work Group would submit a written report identifying the results of the evaluation and a strategy to make the necessary adjustments to the Work Plan to the Washington State Conservation Commission (WSCC). If an adjustment is not necessary, then the report would simply state the results of the evaluation. In either case, the process of adaptive management would be applied at least every 5 years.

Monitoring and adaptive management is based on two strategies

1. **Direct monitoring** of producer participation (Table 5-9)
    a. **Enrolled acres monitoring**. Direct monitoring of stewardship participation (enrolled acres) in key stewardship practices is integral to the outreach strategy. Participation goals were developed based on agricultural activities, critical area functions, and the anticipated effects of implementing specific stewardship practices. During outreach and implementation, enrollment data will be frequently reviewed to determine if participation levels are adequate to meet the goals and benchmarks identified in Section 5.1 and 5.2.
    b. **Sample verification.** In addition to monitoring enrollment acres, GCCD will also monitor a randomly selected sample of 10% of the reported projects, including self-reported/funded, to verify the performance of the stewardship practices in terms of implementation/application and maintenance, relying on the CPPE framework. The relative changes in functions affected from a given stewardship practice will be tracked in relation to baseline conditions, e.g., a +2 CPPE score for a practice will be captured as a +4 if practices are moving to from a -2 to +2.

c. **Adaptive management trigger.** If at any point after the first year the annual producer participation rate drops below 120% of the rate needed to meet the protection benchmark, measures would be taken to address the situation. Participation goals and objectives with potential adaptive management actions are described in Table 5-8.

d. **Adaptive management process.** Table 5-9 includes a more detailed description of the adaptive management process for enrollment, including specific thresholds for each of the key practices.

2. **Indirect monitoring** of indicators of critical areas and their functions and values (Table 5-10)

   a. **Indicators**. Indicators, identified in Section 5.3, will be used to assess whether the enrollment in VSP is having the anticipated effect of protecting and/or enhancing critical area functions and values. If enrollment goals are met, but indicators show a negative trend in critical area functions and values, it will be important to analyze whether this is related to agriculture, and respond accordingly.

   b. **VSP applicability.** Some indicators (e.g. stream temperature) may be responding to climactic changes rather than changes in agricultural practices since 2011. If any link to agriculture is determined, additional stewardship practices, higher enrollment goals, or increased outreach may be necessary. Because detection of long-term trends in environmental indicators is difficult, this review will be taken every 5 years as part of the VSP reporting.

   c. **Process.** Table 5-10 includes a description of how environmental indicators discussed in Section 5.3 will be used to refine the goals and benchmarks of the VSP over time.

Table 5-8
Producer Participation Goal and Adaptive Management for Low Enrollment

Participation Goal: Promote producer participation in voluntary stewardship of agricultural lands and critical areas to meet the protection and enhancement benchmarks and protect critical areas functions and values at a County-wide watershed level.

Objectives/Benchmarks	Performance Metric/Monitoring Method	Identified Cause/ Adaptive Management Threshold	Adaptive Management Action	Who Monitors	When
Sufficient active participation by commercial and non-commercial agricultural operators (farmers and ranchers) over 10 years that achieves the protection of critical area functions and values at a County-wide watershed level.[1]	• Number of acres reported in key stewardship practices • Number of VSP checklists submitted • Sufficient producer participation necessary to meet protection and enhancement benchmarks	Key practice not consistent with agricultural viability	Identify alternative practices that provide similar function and are agriculturally viable	VSP Coordinator	Monitored every year Reported during the Two-year status reports and Five-year performance reports
		Incentives associated with key stewardship practice no longer available	Identify alternative funding or alternative practices that are more likely to be self-funded		
		Inadequate reporting of voluntary participation	Increase outreach to producers		
		Change in agricultural practices that make key practices less applicable	Develop applicable practices that provide similar function		
		Changes in agricultural economy that make self-funded stewardship practice implementation difficult	Identify alternative funding or other incentives		
Passive participation by commercial and noncommercial agricultural operators in VSP stewardship practices is maintained or increased over 10 years on agricultural land (including but not limited to those listed in Table 5-6 and Appendix C, Attachment 2).[2]	• Mapping and aerial photo evaluation and/or rapid watershed assessment of practices in place • Random sampling of farmers and ranchers in the field by technical assistance providers with willing landowners	Decline below the annual average enrollment rate identified in Table 5-9 in key stewardship practices	Increase outreach to producers		
Technical assistance and outreach is provided to agricultural producers to encourage stewardship practices and VSP participation.	• Number of outreach and education events • Number of event attendees	Decline below the baseline annual average enrollment rate identified in Table 5-9 in key stewardship practices	Increase outreach to producers		

Notes:
1. Active participation includes stewardship activities reported either through publicly-funded programs or self-reported through the VSP checklist in coordination with the VSP Coordinator or technical assistance provider.
2. Passive participation includes un-reported stewardship activities.

Table 5-9
Adaptive Management Process for Enrollment

Type	Adaptive Management Objective	Protection Metric[1] (Annual)	Verification	Adaptive Management Trigger (120 % of Protection Metric) (Annual)	Adaptive Management Action	Who Monitors	When
Soil Management	Conservation Crop Rotation	34 acres	10% verified through monitoring and visual recognition	41 acres	Outreach with producers/review approach	Conservation District	Every year
	Cover Crop						
	Polyacrylamide Application						
Water Management	Irrigation Water Management	111 acres	10% verified through monitoring and visual recognition	134 acres	Outreach with producers/review approach	Conservation District	Every year
	Sprinkler System						
Nutrient Management	Nutrient Management	149 acres	10% verified through monitoring and visual recognition	179 acres	Outreach with producers/review approach	Conservation District	Every year
Pest Management	Pest Management	183 acres	10% verified through monitoring and visual recognition	220 acres	Outreach with producers/review approach	Conservation District	Every year
Residue and Tillage Management	Residue Management – Mulch Till	46 acres	10% verified through monitoring and visual recognition	56 acres	Outreach with producers/review approach	Conservation District	Every year
	Residue and Tillage Management – No-till/ Strip Till/ Direct Seed						
Range Management	Range Planting	234 acres	10% verified through monitoring and visual recognition	281 acres	Outreach with producers/review approach	Conservation District	Every year
	Prescribed Grazing						
	Watering Facility	0 each		1 each			
Habitat Management	Conservation Cover	24 acres	10% verified through monitoring and visual recognition	29 acres	Outreach with producers/review approach	Conservation District	Every year
	Stream Habitat Improvement and Management						
	Riparian Herbaceous Cover						
	Tree/Shrub Establishment						
	Restoration of Rare and Declining Habitats						
	Upland Wildlife Habitat Management						
	Fence	4 feet		5 feet			

Note:
1. Metric is calculated based on annual to meet 2021 benchmark values identified in Table 5-7.

Table 5-10
Adaptive Management Process for Critical Area Functions and Values Protection and Enhancement

Goal	Adaptive Management Objective	Indicator Data Source	Performance Metric	Monitoring Method	Adaptive Management Action Threshold	Adaptive Management Action	Who Monitors	When	Party Responsible for Action
Maintain or improve surface water and groundwater quality	Ensure stewardship practices employed with the goal of protecting or improving water quality are effective	Ecology water quality stations	Change in Category 4 and 5 303(d) listings, focused on parameters that potentially have an agricultural source.	Tracking Category 4 and 5 listings through DOE's 303(d) Water Quality tools	Significant trends indicating a decrease from baseline water quality due to agriculture	Determine whether water quality parameters are from agriculture or non-agriculture contributors. Survey with outreach to agricultural producers owners along affected watercourse, waterbody and/or CARA to determine % of participation in stewardship Identify if enrollment in conservation practices is supporting goals Identify stewardship strategies with Work Group to target for implementation to support goal	Conservation District	Every 5 years	Conservation District and participating land owners
Maintain or improve storage capacity and groundwater recharge	Ensure stewardship practices employed with the goal of maintaining or improving storage capacity and groundwater recharge are effective	USGS flow gauges	Changes in flows that are attributable to agricultural practices (as opposed to regional drought)	Tracking water level gauges through USGS Water data	Significant trends indicating a decrease from baseline storage capacity and/or groundwater recharge due to agriculture	Determine whether storage capacity and groundwater recharge issues are due to agriculture Survey with outreach to agricultural producers along floodplains and within CARA to determine percentage of participation in stewardship Identify if enrollment in conservation practices is supporting goals Identify stewardship strategies with Work Group to target for implementation to support goal	Conservation District	Every 5 years	Conservation District and participating land owners
Maintain or improve soil conservation and soil fertility	Ensure stewardship practices employed with the goal of maintaining or improving soil functions are effective	USDA NRI monitoring result	Changes in volume of soil and/or overall soil fertility relative to critical areas	Tracking soil data through USDA NRI monitoring results, tracking sediment parameter within DOE's 303(d) Water Quality tools	Significant trends indicating a decrease from baseline soil and/or soil fertility due to agriculture	Determine whether soil issues are due to agriculture Survey with outreach to agricultural producers to determine percentage of participation in stewardship Identify if enrollment in stewardship practices is supporting goals Identify stewardship strategies with Work Group to target for implementation to support goal	Conservation District	Every 5 years	Conservation District and participating land owners

Goal	Adaptive Management Objective	Indicator Data Source	Performance Metric	Monitoring Method	Adaptive Management Action Threshold	Adaptive Management Action	Who Monitors	When	Party Responsible for Action
Protect or enhance terrestrial and aquatic habitat	Ensure stewardship practices employed with the goal of protecting or improving habitat are effective	WDFW Priority Habitats and Species data or other aerial and GIS-based evaluation	Changes in amount of HCAs and wetlands	Tracking priority habitats and species data through the WDFW Evaluating random sample areas (including a representation of lands with conservation practices documented and lands where practices are not documented) using aerial imagery and associated GIS methods	Significant trends indicating a decrease from baseline terrestrial and/or aquatic habitat due to agriculture	Determine whether habitat issues are due to agriculture Survey with outreach to agricultural producers property owners to determine percentage of participation in stewardship Identify if enrollment in stewardship practices is supporting goals Identify stewardship strategies with Work Group to target for implementation to support goal	Conservation District	Every 5 years	Conservation District and participating land owners

6 Implementation

6.1 Framework for Implementation

Work Plan implementation is expected to continue largely through established programs and organizations. As noted previously, many agricultural-based programs, activities, and efforts are already in place to protect and, in many cases, enhance critical areas and agricultural viability. Significant progress has been made to these ends in recent years. This Work Plan has been designed to fit within this existing framework, with supplemental efforts identified to meet state VSP requirements. These requirements include documenting 2011 critical areas baseline conditions, establishing goals and measurable benchmarks, identifying stewardship practices, and establishing monitoring and adaptive management measures to track Work Plan performance in protecting critical areas and maintaining agricultural viability. The tracking timeframe for this Work Plan is the first 10 years of implementation.

RCW 36.70A.705, the Work Group is responsible for developing the Work Plan and overseeing its implementation. Work Plan implementation responsibilities include: agricultural producer participation and outreach; technical assistance; program performance tracking and reporting; and adaptive management. The GCCD and others can help in performing these responsibilities. The anticipated implementation budget for this Work Plan is summarized in Table 6-1, under the assumption that State funding for VSP is continued at a level of $250,000 each biennium for the County.

Table 6-1
Implementation Budget

Task	Activities	Who	Biennium Budgets[1]
Education, Outreach, and Technical Assistance	• Conduct outreach and develop education materials • Assist producers in developing stewardship plans • Facilitate VSP checklist reporting • Identify cost-share to leverage other conservation project funding	GCCD/ VSP Coordinator	$165,000
Monitoring, Reporting, and Adaptive Management	• Annual monitoring and tracking • Develop adaptive management as needed • Prepare 2-year status reports • Prepare 5-year progress reports	GCCD/ VSP Coordinator or contract services	$70,000[2]
Work Group Coordination	• Attend quarterly meetings • Coordinate report and adaptive management review and approvals	GCCD/ VSP Coordinator	$15,000
		Total State Budget	**$250,000**

Notes:

1. Assumes State funding for VSP is continued at a level of $250,000 each biennium for the County.
2. Costs will be less in non-reporting years to support annual monitoring and tracking efforts. The majority of budget item will support costs during the 2-year and 5-year reporting years: 2019, 2021, and 2026.

Ultimately, agricultural producers play the most integral role in VSP implementation. Success of the VSP relies on these producers to voluntarily implement stewardship actions that help meet Work Plan goals and benchmarks for critical areas protection and agricultural viability.

6.2 Agricultural Producers Participation, Technical Assistance, and Outreach

Many producers are already implementing stewardship actions throughout the County that are protecting or enhancing critical areas and supporting agricultural viability, as described in Section 4. Two participation objectives have been established for Grant County VSP implementation:

1. Better identify and document the existing measures that have been put in place since 2011 through private-sector activity and outside of government programs.
2. Increase the level of participation among agricultural producers in implementing stewardship practices.

Regarding the first objective, it is expected the measures summarized in Section 4 represent only a portion of the total measures implemented during this period. Outreach to individual landowners, as well as to private industry groups, is planned in Years 0 to 2 to better document existing practices and identify future practices that might be implemented outside of government programs.

Additional outreach and coordination with the private sector, resulting from the initial outreach activities, is expected to continue through the remaining 8 years of the initial 10-year performance tracking period.

The second participation objective is focused on increasing the number of stewardship practices implemented by agricultural producers, helping to meet protection and, where possible, enhancement performance goals outlined in Section 5. Achieving this objective includes offering technical assistance to producers with the development of individual farm stewardship plans, identifying and targeting technical assistance and financial incentive programs that further the goals of the Work Plan, and making producers aware of available private- and public-sector financial incentives and programs. This technical assistance would also include helping to estimate the expected benefits that can be realized from implementing the measures identified in individual stewardship plans, including agriculture viability benefits at the farm level. VSP success depends on producer participation, and producer participation depends on effective protection of producers' confidential business information from disclosure. According to guidance from the Washington State Conservation Commission, statutory provisions on the confidentiality and disclosure of a farm plan also apply to a VSP "individual stewardship plan" that a conservation district helps a producer develop (unless the producer expressly permits disclosure). VSP technical assistance providers can provide more detail on applicable confidentiality and disclosure provisions for particular types of agricultural operations and conservation programs.

Producer participation goal:
In addition to the benchmarks for enrolled acres in stewardship practices identified in Section 5, this Work Plan includes a producer participation goal to help track progress towards the Work Plan's protection and enhancement benchmarks.

It is estimated the reported stewardship practices in the County account for approximately 10% of the County's agricultural operators. This Work Plan includes the goal of **promoting producer participation (as measured either by new enrollment in stewardship practices or new producer reporting) as described in Table 5-8**. New acres enrolled will include new participants in privately-funded practices as captured through reporting for existing and new projects and new participants accounted for in government-funded programs. This goal will be tracked annually with progress reported in the 2-year and 5-year reports.

Results from these efforts will be tracked and documented, along with documenting any lands converted from stewardship practices back to more conventional farming, so the overall net effect on protecting (and where applicable, enhancing) critical areas is characterized.

6.2.1 Organization Leads

The GCCD will lead the public-sector program participation efforts, supported by other agencies, such as WSDA, WDFW, Washington State Department of Ecology (Ecology), NRCS, and FSA, and others, with their respective programs and support from the private sector. See Table 6-3 and Appendix D for additional detail on public-sector plans, programs, and agency partners that support the goals of this Work Plan.

Technical assistance occurs in a variety of ways, including developing individual farm stewardship or conservation plans, range management plans, providing advice on use of specific practices, and sharing information at forums, meetings, and other venues where stewardship practices are highlighted for environmental and economic benefits. GCCD will prepare biennial work plans that incorporate public-sector activities to be implemented to achieve VSP outreach and technical assistance objectives, and also identify plans for working with the private sector to capture information about practices put in place through its efforts. See Table 6-3 and Appendix D for additional detail on public-sector plans, programs, and agency partners that support the goals of this Work Plan.

Table 6-2 identifies potential VSP outreach strategies, opportunities, and forums.

Table 6-2
VSP Outreach Opportunities

Venue	Description
Tours	• GCCD-led annual tours • Legislative and partner agencies outreach tours • On-farm testing/demonstrations • Field trials
Meetings	• GCCD monthly board meetings (public meetings) • GCCD annual meetings • Annual regional conservation district meetings • Private-sector agricultural industry-led meetings • Agricultural associations • Local government (city and county) • Irrigation districts • USDA Local Work Group • FSA County Committee

Venue	Description
Media	• GCCD and private-sector agricultural industry websites, newsletters, and social media sites • Grant County website • WSCC news and announcement webpage • Articles, announcements, and advertisements with local newspapers • E-mail distribution lists • FSA newsletter • Washington State University newsletter
Others	• Informational booths and displays at fairs and agricultural conventions • Individual outreach, consistent with GCCD policies • News releases

Notes:
FSA: Farm Service Agency
GCCD: Grant County Conservation District
USDA: U.S. Department of Agriculture
WSCC: Washington State Conservation Commission

6.3 Monitoring, Reporting, and Adaptive Management

Monitoring performance, reporting progress on Work Plan goals and benchmarks, and implementing adaptive management measures when necessary are part of this Work Plan. Tracking program performance and reporting includes the following tasks:

- **Two-year status reports.** Conducting a program evaluation and providing a written report on the status of the Work Plan, including accomplishments, to the County and to the WSCC within 60 days (by the end of September) after the end of each biennium. Based on a January 14, 2016, receipt of funding date, 2-year reports are due by end of September in 2018, 2020, 2022, 2024, and 2026.
- **Five-year performance reports.** Developing and providing to the Washington State Conservation Commission 5-year progress reports on Work Plan performance in meeting goals and benchmarks. Based on a January 2016 start date, 5-year progress reports would be due in early 2021 and 2026.

The timelines for this implementation process is shown in Table 6-3.

Table 6-3
Timelines for Implementation Process

Category	Schedule	Roles and Responsibilities
Periodic Evaluations	Finalize Work Plan in 2017 (Latest due date is Sep. 14, 2018 due date per WSCC)	Work Group
	2019, 2021, et seq.	Work Group
	Funding receipt date in 2016	Work Group oversees;

Category	Schedule	Roles and Responsibilities
Report on Goals and Benchmarks	2021, 2026, et. seq.	GCCD prepares report
Adaptive Management or Additional Voluntary Actions	Ongoing after 2021	Work Group oversees Work Plan adjustment recommendations to WSCC

Notes:
GCCD: Grant County Conservation District
Work Group: Grant County Voluntary Stewardship Program Work Group
Work Plan: Grant County Voluntary Stewardship Program Work Plan
WSCC: Washington State Conservation Commission

The 2-year status and 5-year performance reports would be developed by GCCD under the direction of the Work Group. Draft reports would be prepared and presented to the Work Group for review and comment. Comments would be addressed and edits made to the reports, which would then be approved by the Work Group, after they are satisfied that the reports are accurate and complete. Reports would be distributed to the County, WSCC, and others by GCCD on behalf of the Work Group. The general timing for reporting will be as follows:

- Monitoring will focus on the measurable benchmarks described in Section 5 and will include periodic evaluations every 2 years.
- The watershed group must report no later than 5 years after receipt of funding (2016 for Grant County) on whether the protection and enhancement goals have been met or identify an adaptive management plan to meet VSP goals and benchmarks.
- The Work Group must report not later than 10 years after receipt of funding, and every 5 years thereafter, whether it has met the protection and enhancement goals and benchmarks of the Work Plan.

Work plans often need to adapt to changing conditions and observations of results that aren't consistent with established goals. Adaptive management is the process for, "continually improving management policies and practices by learning from the outcomes of the operational programs" (Nyberg 1999). If the Work Group determines goals have not been met, they must propose and submit an Adaptive Management Plan to achieve the goals and benchmarks. The adaptive management process is outlined in Section 5. Monitoring indicators will inform the long-term viability of the Adaptive Management Plan, based on goals for protecting critical area functions. Monitoring will focus on the measurable benchmarks and goals also described in Section 5

6.4 Existing Programs, Plans, and Other Applicable Regulations

The GMA was passed by the Washington State legislature in 1990 to help the state manage the growth of development and activities that have the potential to affect sensitive environments and species, including critical areas. The VSP is part of the GMA, but was also written to work with other existing programs, plans, and applicable rules and regulations. The following subsections provide a

brief overview of the existing resources used in this Work Plan and describes how they relate to other applicable rules and regulations (the regulatory environment).

6.4.1 Existing Public Conservation Programs

The existing programs, plans, and guidance documents that were used for this Work Plan are from federal conservation programs, local- and county-based watershed and groundwater management programs, and federal, state, and local planning efforts. These resources have been incorporated into this Work Plan to the maximum extent practical, consistent with the intent of the VSP. There are a variety of conservation programs available to agricultural producers that provide technical assistance and resources for ways to improve the agricultural viability of their land while protecting or enhancing critical areas. Funding opportunities are also available through these programs for qualifying applicants and projects. Table 6-4 includes a comparison of conservation programs that are currently available. Appendix C contains more detail for each program and links to the program's webpages.

Table 6-4
Public Sector Conservation Programs Summary

Lead	Description	Technical Assistance	Financial Assistance	Partnership Agreements	Contractor Easement
Natural Resources Conservation Service (NRCS)	NRCS provides technical and financial assistance to help agricultural producers make and maintain conservation improvements on their land. NRCS also offers conservation easement programs and partnerships to leverage existing conservation efforts on farm lands.	●	●	●	●
Farm Service Agency (FSA)	FSA oversees several voluntary, conservation-related programs that work to address several agriculture-related conservation measures, including programs such as CRP and CREP.		●		●
Washington State Conservation Commission (WSCC)	WSCC works with CDs to provide voluntary, incentive-based programs for implementation of conservation practices. WSCC supports the CDs through financial and technical assistance; administrative and operational oversight; program coordination; and promotion of CDs activities and services.		●	●	
Washington State Department of Fish and Wildlife (WDFW)	WDFW provides financial assistance for habitat projects that restore and/or preserve fish and wildlife habitat through funding opportunities such as the ALEA Volunteer Cooperative Grant Program.		●		

Lead	Description	Technical Assistance	Financial Assistance	Partnership Agreements	Contractor Easement
Washington State Recreation and Conservation Office	The Washington State Recreation and Conservation Office provides funding to protect aquatic lands and for projects aimed at achieving overall salmon recovery, including habitat projects and other activities that result in sustainable and measurable benefits for salmon and other fish species. Funding is provided through programs such as ALEA and Salmon Recovery Funding Board Grant Program.		•		
Washington State Department of Ecology (Ecology)	Ecology provides funding for water-quality improvement and protection projects, including programs such as the Water Quality Financial Assistance program and voluntary partnership programs such as the Farmed Smart Partnership.		•	•	
Washington State University (WSU) Extension	WSU Extension provides agricultural producers with technical assistance, research, and education services.	•			
Grant County Conservation Districts (GCCD)	GCCD works through voluntary, incentive-based programs to assist landowners and agricultural operators with the conservation of natural resources throughout the CDs, including cost-share and watershed-based partnership programs such as the Regional Conservation Partnership Program.	•	•	•	

Notes:
ALEA: Aquatic Lands Enhancement Account
CREP: Conservation Reserve Enhancement Program
CRP: Conservation Reserve Program

6.4.2 Private-sector and Not-for-profit Programs

Private-sector services and programs are available through existing agri-businesses and associations serving the County such as food-processing companies, certified crop consultants, and agri-businesses providing soil services, and integrated water, pest, and nutrient management services.

6.4.3 Existing Plans and Guidance

Available plans and guidance were referenced for developing the goals and benchmarks in this Work Plan and were obtained from existing federal, state, and local sources, including water quality improvement projects, species and habitat recovery recommendation and guidance, including shrub-steppe restoration and sage-grouse guidelines, and groundwater management plans.

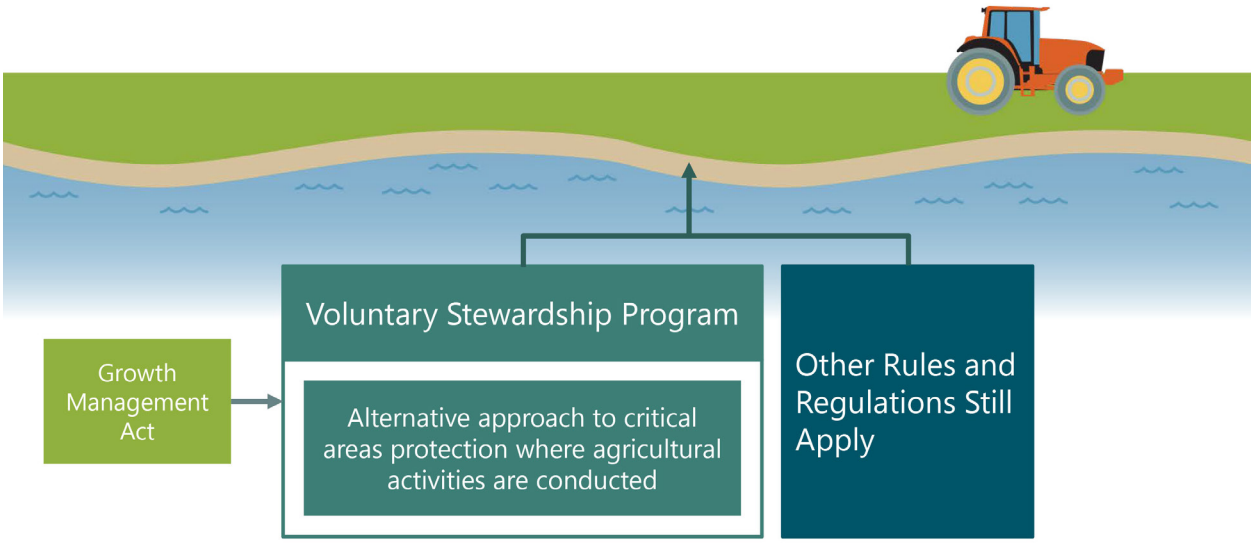
Ecology has been developing strategies to protect water quality and improve working relationships with agricultural landowners and livestock producers. Programs, such as the Farmed Smart

Partnership, provide farms that achieve and maintain certification by a third-party examiner safe harbor from Ecology's water pollution regulations for practices related to dryland crop farming. Ecology has also established a new Agriculture and Water Quality Advisory Committee comprising a broad array of agricultural participants. The new committee aims to provide an open forum for dialogue regarding water quality protection and a healthy agricultural industry. See Appendix D for a more comprehensive list of existing plans and guidance.

6.4.4 Regulatory Environment

Even though the VSP is carried out under the GMA, other rules and regulations still apply for agricultural activities that have the potential to impact critical areas (Appendix D). Existing federal and state rules and regulations will still apply to agricultural activities that have the potential to affect the environment, including the federal Clean Air Act, Clean Water Act, and Endangered Species Act. Other state and local environmental regulations may also apply to agricultural activities with the potential to affect the environment. Figure 6-1 is intended to show how the VSP relates to other rules and regulations that apply separately from critical areas protection under the GMA.

Figure 6-1
Voluntary Stewardship Program Regulatory Underpinning



6.5 Implementation by Community Planning Areas

Although the Work Plan and the goals and benchmarks discussed in Section 5 apply County-wide, GCCD will tailor implementation approaches to address priorities within each community planning unit (see Appendix B-2).

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Appendix A
VSP Map Folio

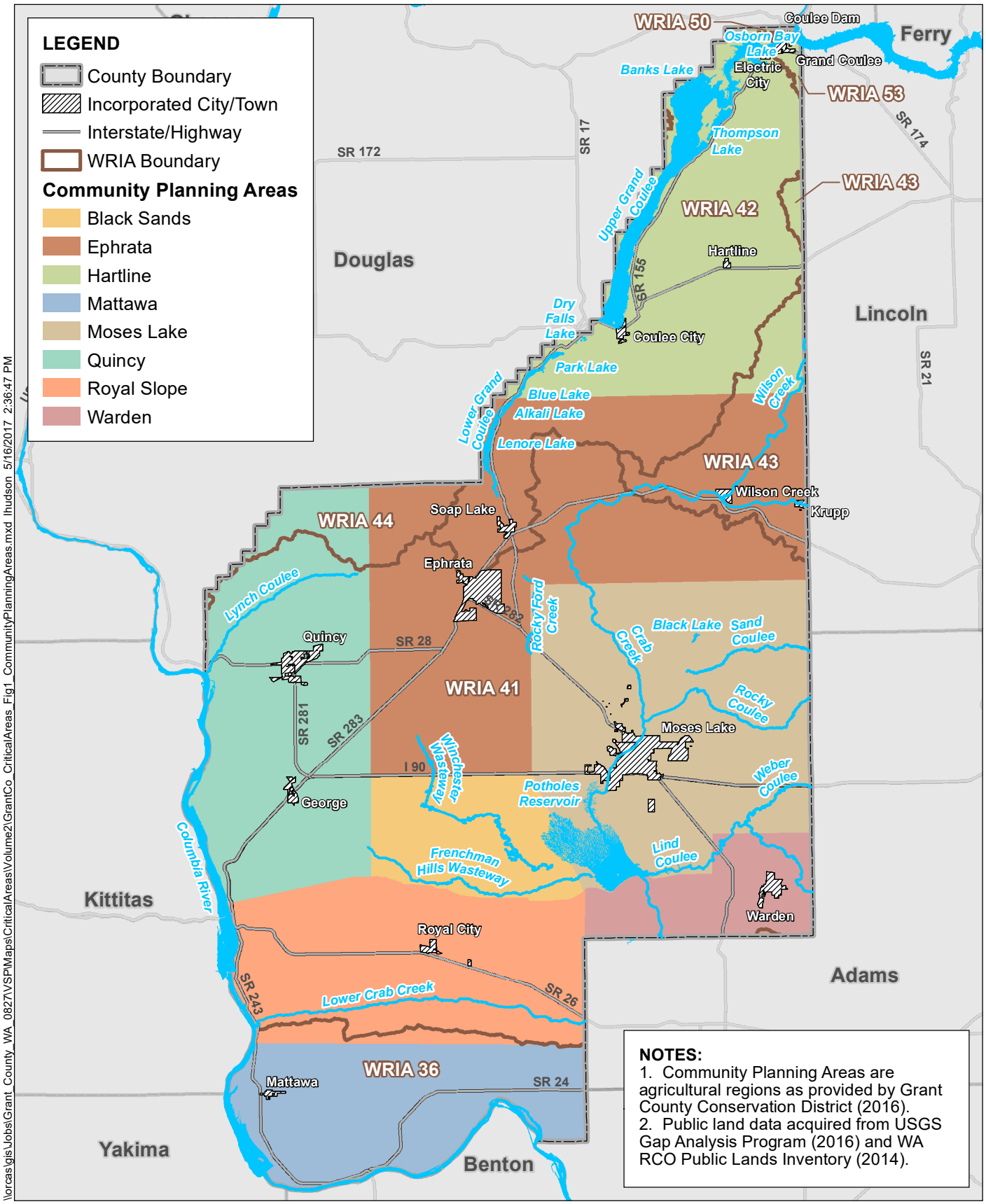
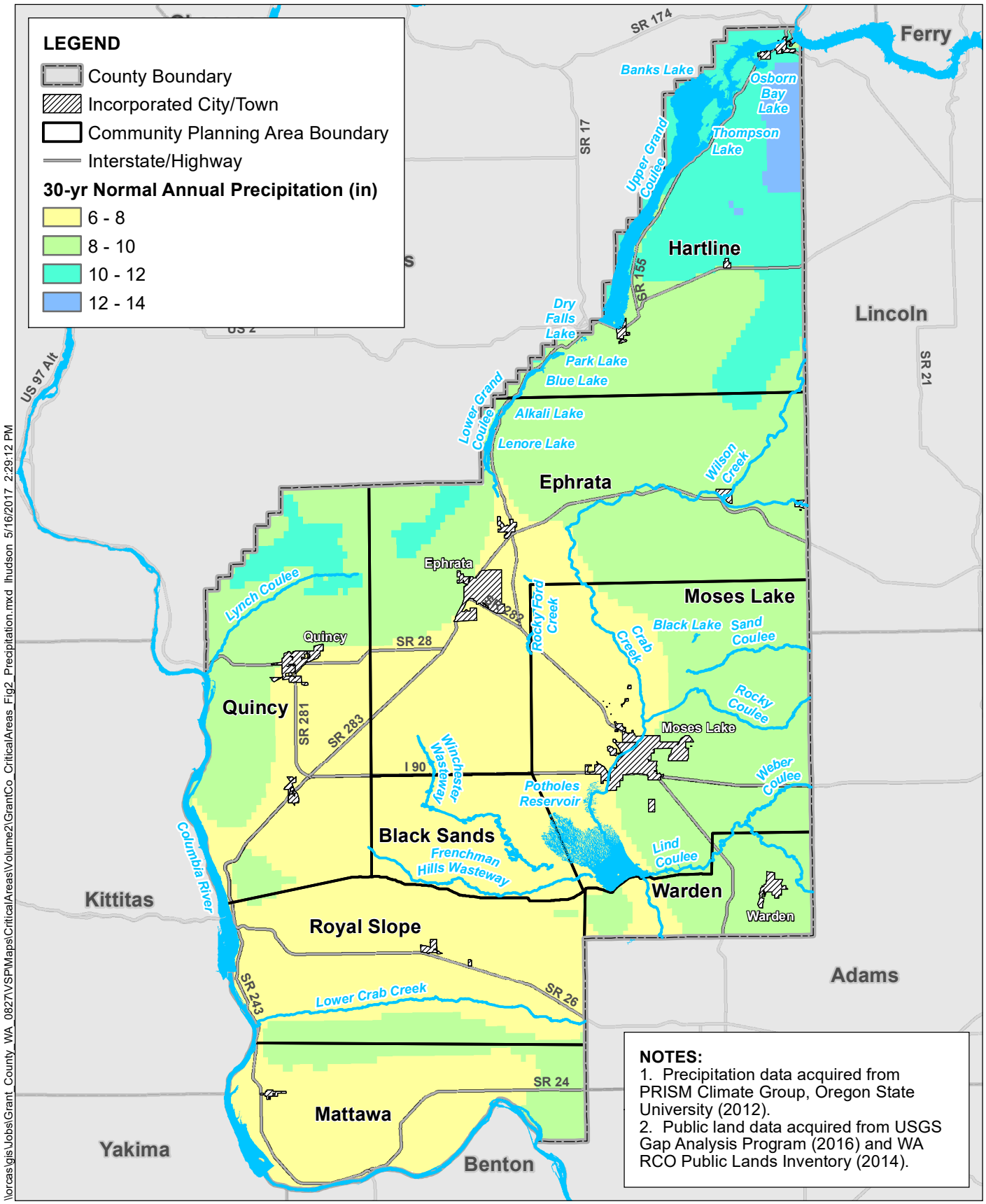


Figure 1
Water Resources and Community Planning Areas
Voluntary Stewardship Program
Grant County, WA



NOTES:
1. Precipitation data acquired from PRISM Climate Group, Oregon State University (2012).
2. Public land data acquired from USGS Gap Analysis Program (2016) and WA RCO Public Lands Inventory (2014).

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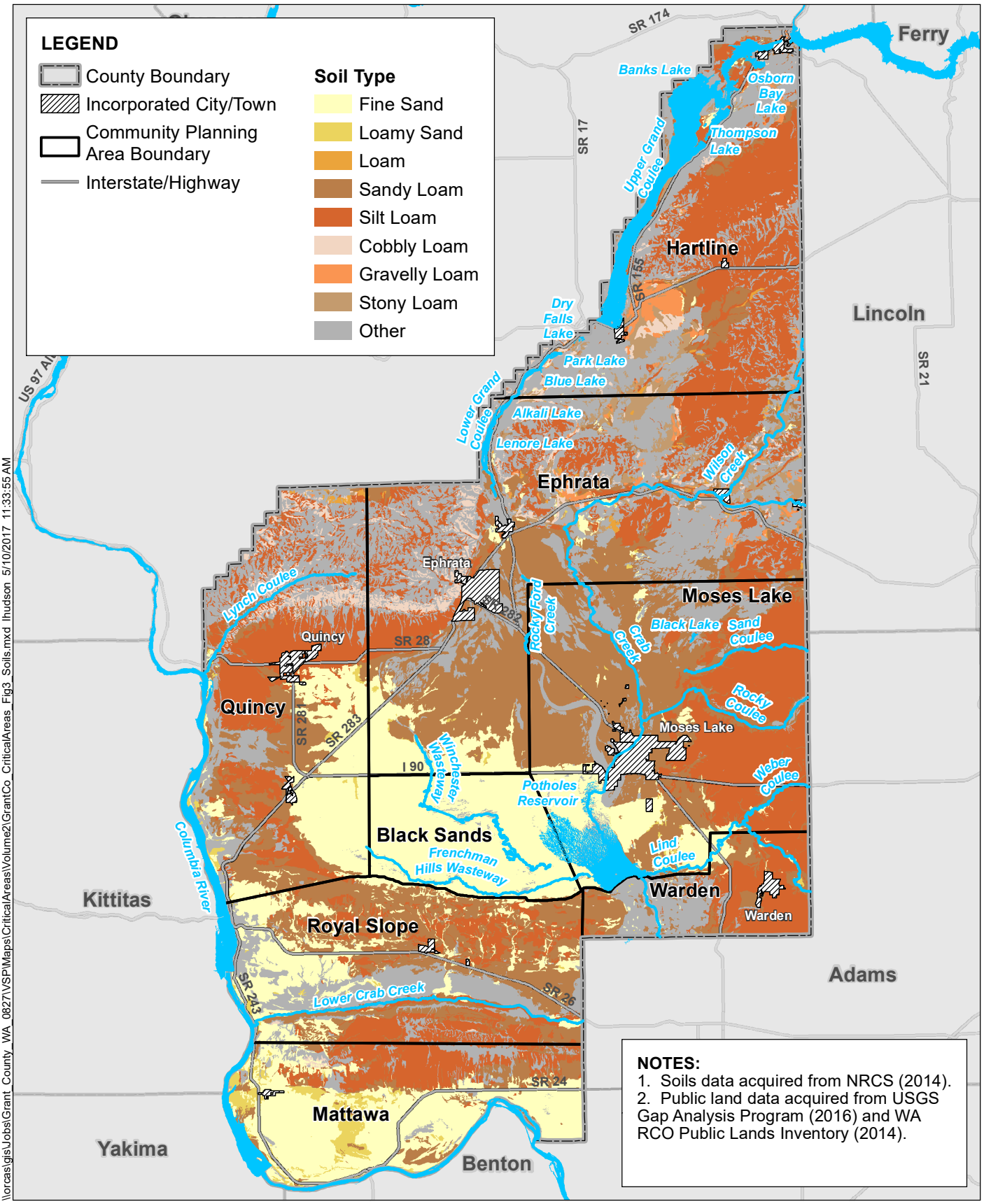
Figure 2
Precipitation Map
Voluntary Stewardship Program
Grant County, WA



NOTES:
1. Soils data acquired from NRCS (2014).
2. Public land data acquired from USGS Gap Analysis Program (2016) and WA RCO Public Lands Inventory (2014).

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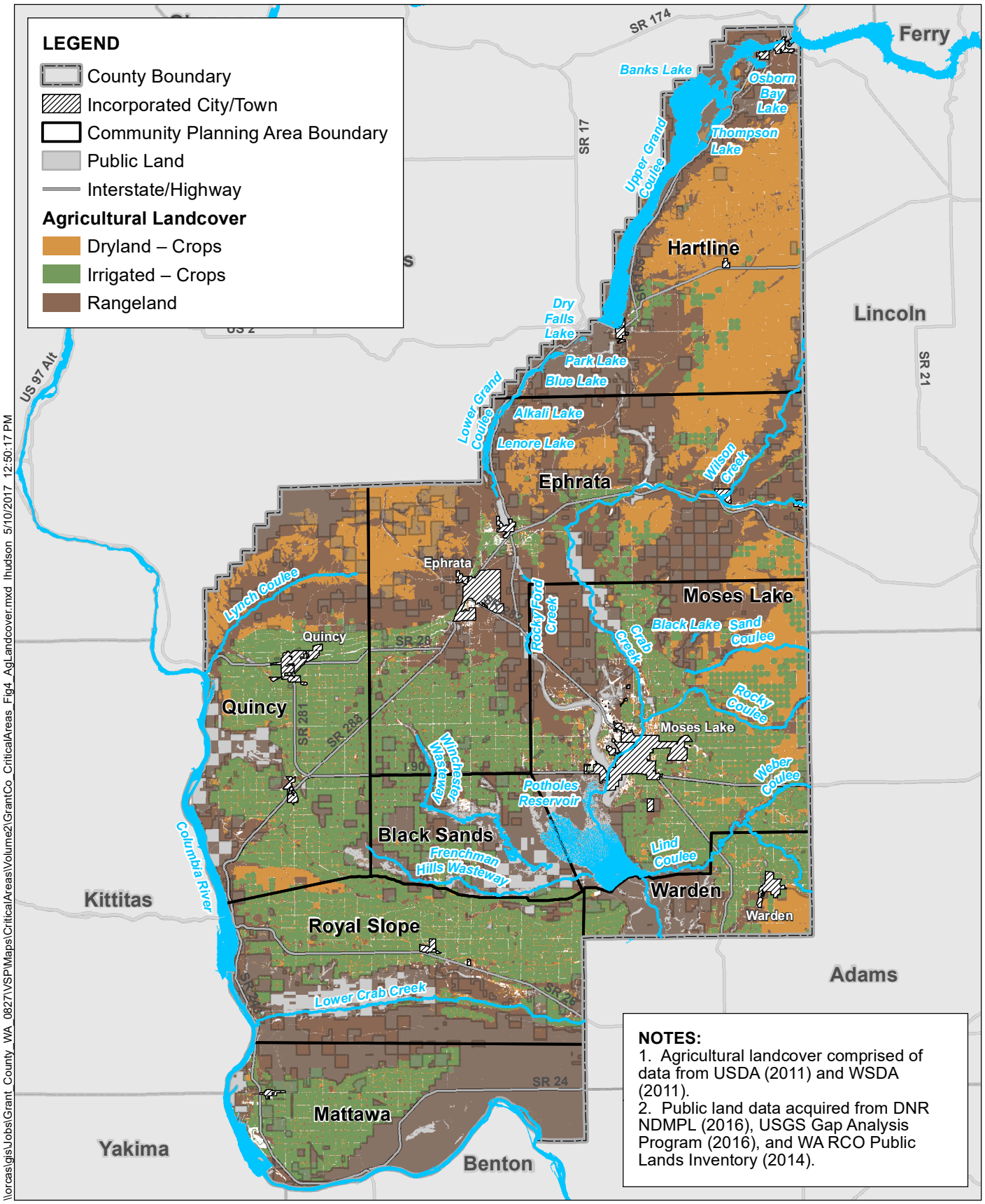
Figure 3
NRCS SSURGO Soils
Voluntary Stewardship Program
Grant County, WA



NOTES:
1. Agricultural landcover comprised of data from USDA (2011) and WSDA (2011).
2. Public land data acquired from DNR NDMPL (2016), USGS Gap Analysis Program (2016), and WA RCO Public Lands Inventory (2014).

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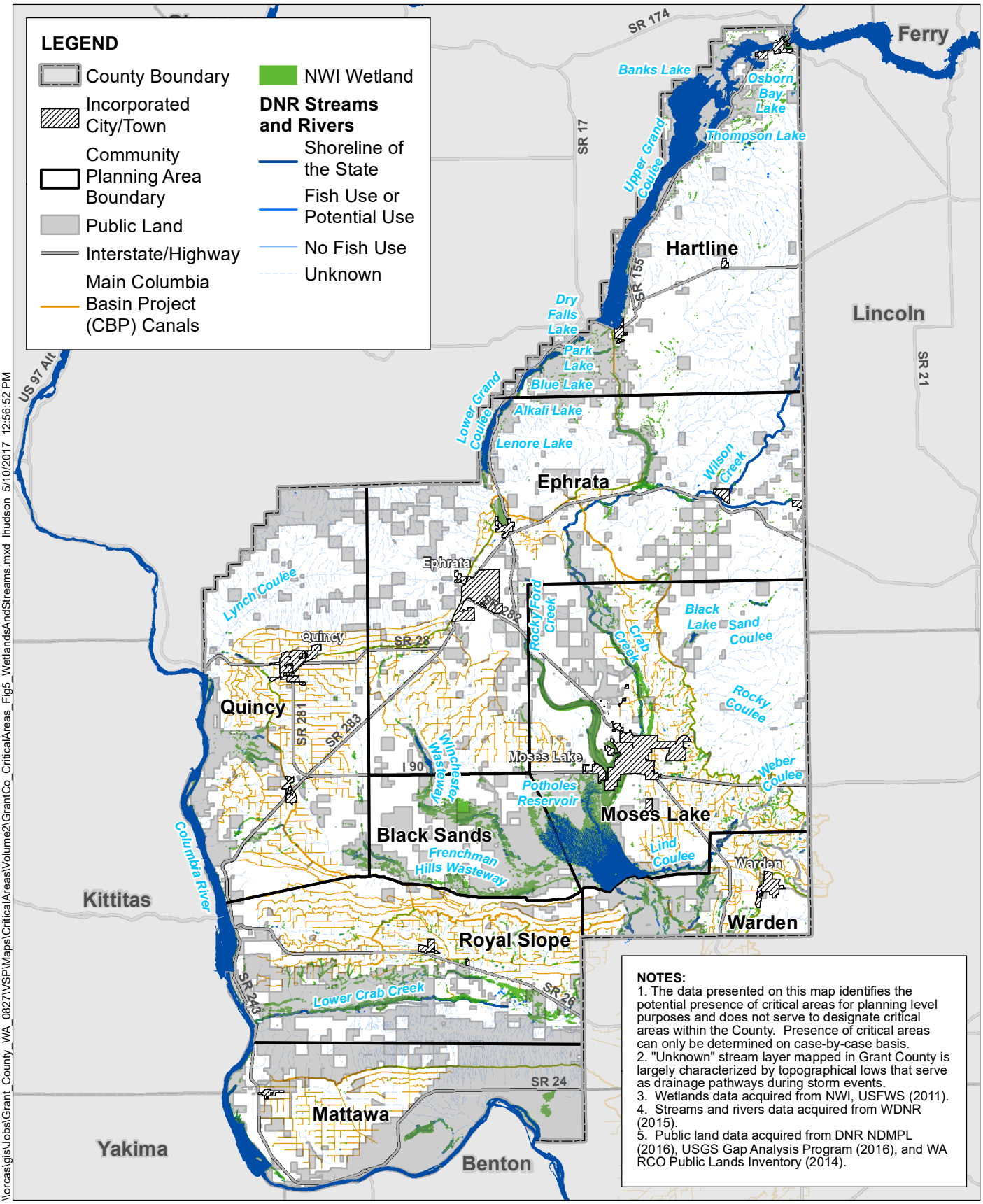
Figure 4
Agricultural Landcover
Voluntary Stewardship Program
Grant County, WA



NOTES:
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Presence of critical areas can only be determined on case-by-case basis.
2. "Unknown" stream layer mapped in Grant County is largely characterized by topographical lows that serve as drainage pathways during storm events.
3. Wetlands data acquired from NWI, USFWS (2011).
4. Streams and rivers data acquired from WDNR (2015).
5. Public land data acquired from DNR NDMPL (2016), USGS Gap Analysis Program (2016), and WA RCO Public Lands Inventory (2014).

\\orcas\gis\Jobs\Grant_County_WA_0827\VSP\Maps\CriticalAreas\Volume2\GrantCo_CriticalAreas_Fig5_WetlandsAndStreams.mxd lhudson 5/10/2017 12:56:52 PM

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Figure 5
Wetlands and Streams
Voluntary Stewardship Program
Grant County, WA

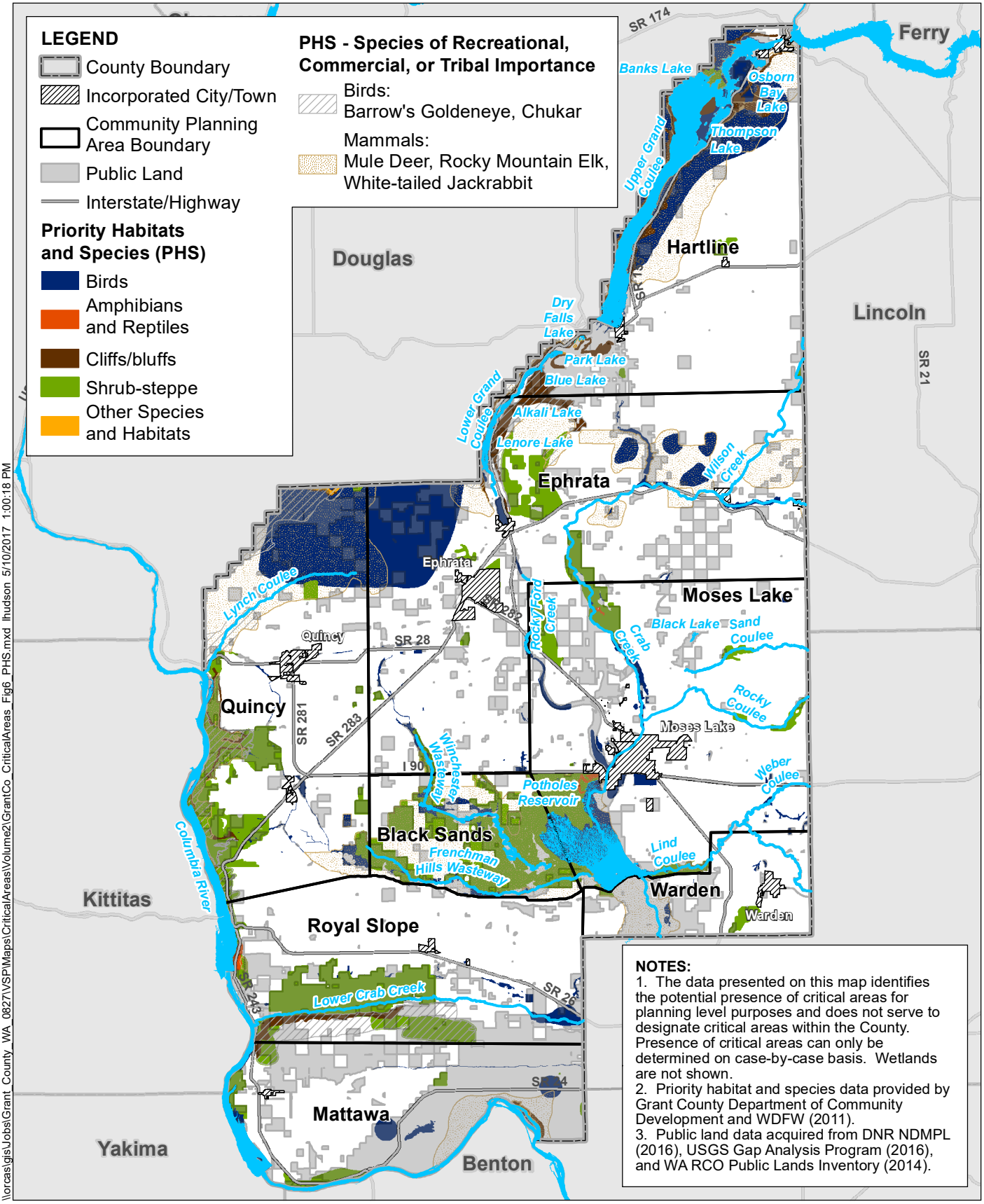

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Figure 6
Fish and Wildlife Habitat Conservation Areas (PHS)
Voluntary Stewardship Program
Grant County, WA

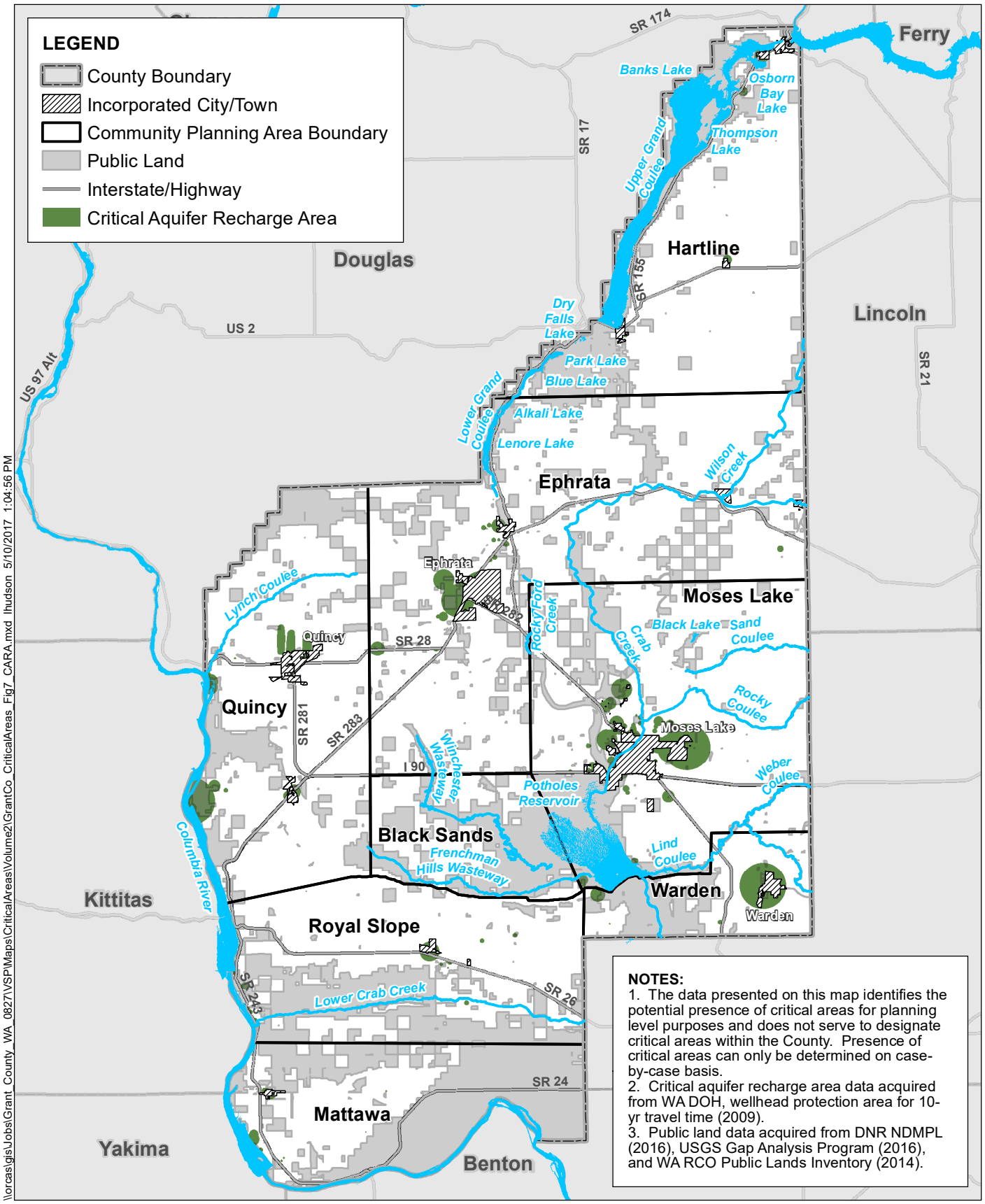
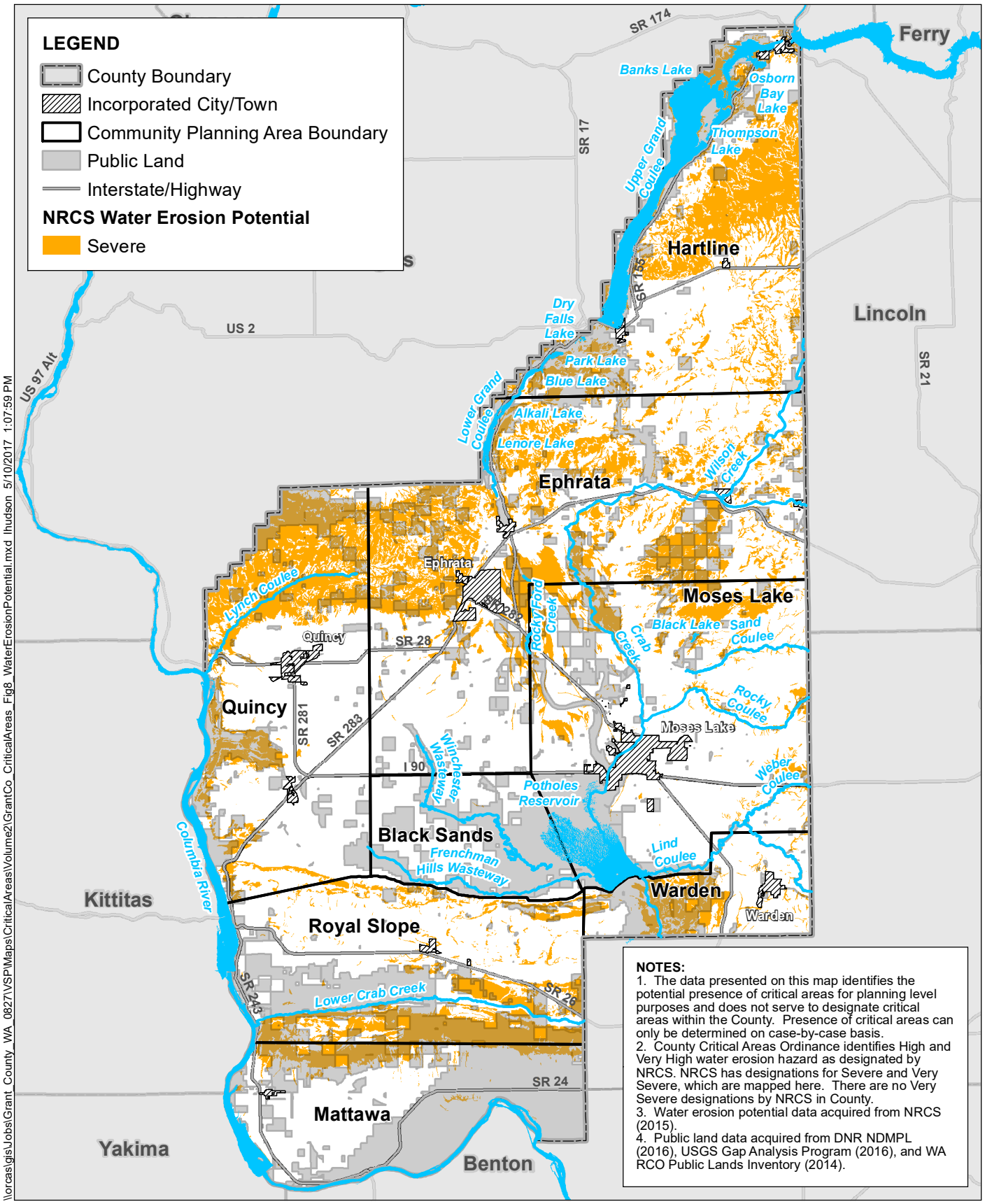


Figure 7
Critical Aquifer Recharge Areas
Voluntary Stewardship Program
Grant County, WA



NOTES:
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Presence of critical areas can only be determined on case-by-case basis.
2. County Critical Areas Ordinance identifies High and Very High water erosion hazard as designated by NRCS. NRCS has designations for Severe and Very Severe, which are mapped here. There are no Very Severe designations by NRCS in County.
3. Water erosion potential data acquired from NRCS (2015).
4. Public land data acquired from DNR NDMPL (2016), USGS Gap Analysis Program (2016), and WA RCO Public Lands Inventory (2014).

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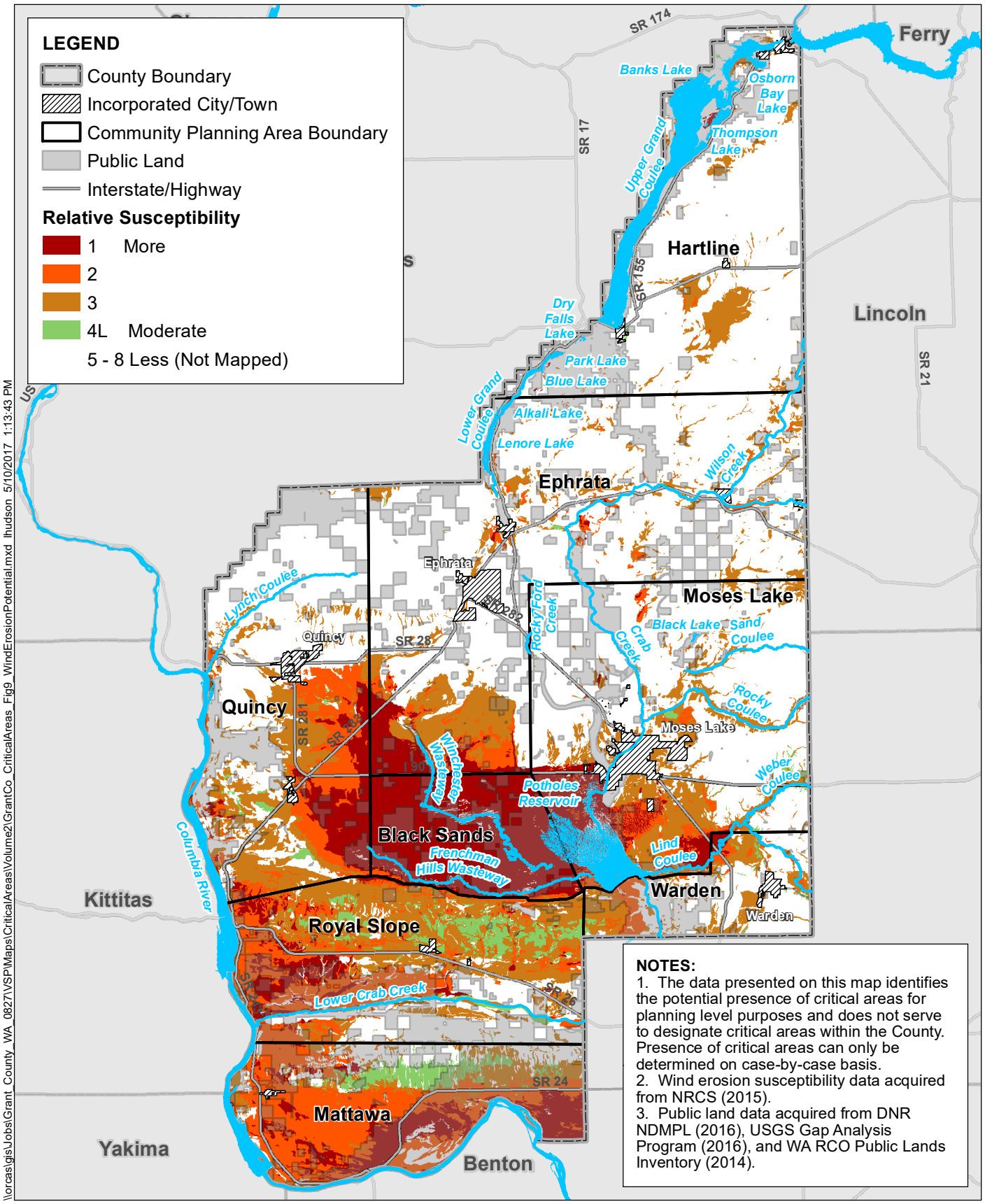
Figure 8
Geologic Hazard Areas – Water Erosion Potential
Voluntary Stewardship Program
Grant County, WA



NOTES:
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Presence of critical areas can only be determined on case-by-case basis.
2. Wind erosion susceptibility data acquired from NRCS (2015).
3. Public land data acquired from DNR NDMPL (2016), USGS Gap Analysis Program (2016), and WA RCO Public Lands Inventory (2014).

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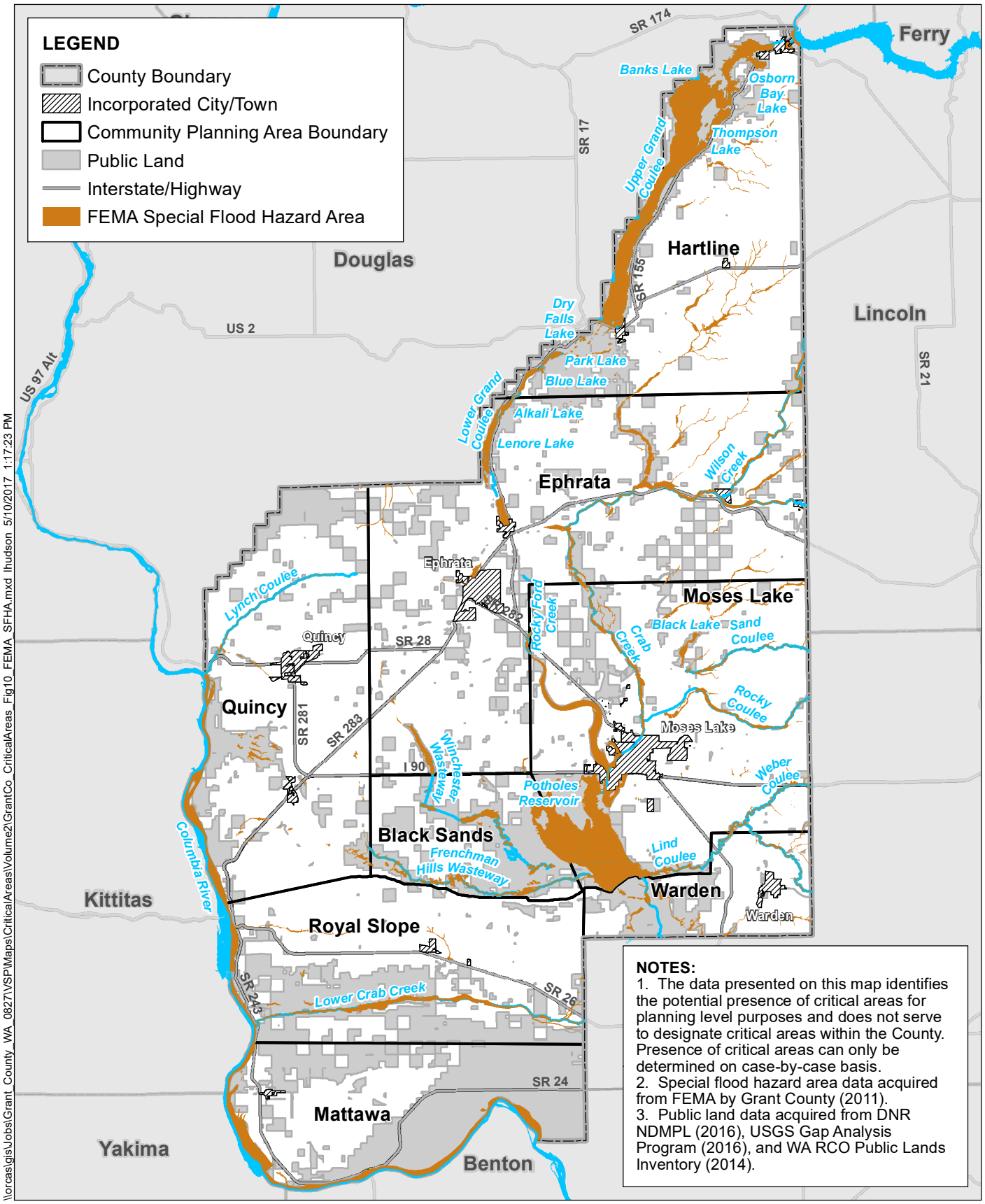
Figure 9
Geologic Hazard Areas – Wind Erosion Susceptibility
Voluntary Stewardship Program
Grant County, WA



NOTES:
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Presence of critical areas can only be determined on case-by-case basis.
2. Special flood hazard area data acquired from FEMA by Grant County (2011).
3. Public land data acquired from DNR NDMPL (2016), USGS Gap Analysis Program (2016), and WA RCO Public Lands Inventory (2014).

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Figure 10
Frequently Flooded Areas
Voluntary Stewardship Program
Grant County, WA

Appendix B
Baseline Conditions Summary

- B-1: Baseline Conditions Summary Methods and Data Sources
- B-2: Community Planning Areas
- B-3: Grant County Critical Areas Ordinance Designations and Definitions
- B-4: Baseline Conditions Critical Areas Data Summary
- B-5: Agricultural Viability Interview Summary
- B-6: Grant County Water Quality 303(d) Listings (2016)

Appendix B-1
Baseline Conditions Summary Methods and Data Sources

Appendix B-1: Baseline Conditions Summary Method and Data Sources

Overview

The effective date of the VSP legislation is July 22, 2011. This is also the date chosen by the legislature as the applicable baseline for accomplishing the following items (RCW 36.70A.703):

- Protecting critical areas functions and values.
- Providing incentive based voluntary enhancements to critical areas functions and values.
- Maintaining and enhancing the viability of agriculture in the County.

The 2011 baseline sets the conditions from which the County will measure progress in implementing the Work Plan and meeting measurable benchmarks. Measurable benchmarks are a required Work Plan element under VSP (RCW 36.70A.720 (1)(E)) and provided in Grant County VSP Work Plan, Section 5: Goals, Benchmarks, and Adaptive Management.

The methods and data sources relied upon to establish 2011 baseline conditions for the County's five critical areas and agricultural activities are described in the following sections.

Methods for Establishing Baseline Conditions

The 2011 baseline conditions summary prepared for Appendix B includes an inventory of agriculture land cover and critical area resources. The following methods were applied in the baseline conditions inventory (see Table 1 for a complete list of data sources):

- **Agricultural landcover assessment.** This was based primarily on Washington State Department of Agriculture (WSDA) 2011 agricultural landcover data for croplands (irrigated and dryland agriculture). U.S. Department of Agriculture (USDA) 2011 agricultural landcover data was primarily relied upon for additional data on rangelands. Three major agricultural land categories were characterized within the County: 1) irrigated; 2); dryland and 3) rangeland. These categories are associated with different crops, agricultural activities, stewardship practices, and intersections with critical areas.
- **Critical areas assessment** was based on:
  - Critical areas designations included in the County's Critical Areas Ordinance (CAO; 2011) (see Appendix B-3 for CAO summary).
  - Data sources for planning-level critical areas mapping (Appendix A: Map Folio) and critical area/agricultural intersections summaries (Appendix B-4: Baseline Conditions Critical Areas Data Summary Tables) ranged from 2009 to 2016 and included data relied on for the County's recent Shoreline Master Program update (Grant County 2014). See Table 1 for a complete list of data sources.

- **Privately owned lands.** These were used when assessing critical area intersections with agricultural lands. The VSP does not apply to agricultural activities occurring on public lands through leases or other agreements.
- **Use of maps.** Data sources and the VSP Map Folio (Appendix A) were used to assess the potential presence of critical areas within the County and intersection with agricultural lands were used for planning-level purposes only. Actual critical areas presence is determined on a case-by-case basis through farm stewardship planning.

Data Sources

The data sources listed in Table 1 were used in the baseline conditions inventory, to assess the conditions as close to the 2011 baseline as data availability allowed.

Table 1
2011 Baseline Conditions Data Sources

Title	Year	Author
Watershed Resource Inventory Area (WRIA)	2000	DOE
Wellhead Protection Area	2009	DOH
National Landcover Data Set	2011	USGS
National Wetland Inventory Data	2011	USFWS
Priority Habitat and Species Data	2011	WDFW
Special Flood Hazard Areas	2011	FEMA
USDA Agricultural Landcover	2011	USDA
WSDA Agricultural Landcover	2011	WSDA
PRISM Climate Group Precipitation Data	2012	OSU
Hydraulic Unit Code (HUC) 10 data	2013	BLM
Public Lands (Public Lands Inventory)	2014	WRCO
Streams and Rivers Data	2015	WDNR
Water Erosion Potential	2015	NRCS
Wind Erosion Susceptibility	2015	NRCS
Agriculture Region Boundaries	2016	AQEA
Public Lands (Gap Analysis Program)	2016	USGS

Appendix B-2
Community Planning Areas

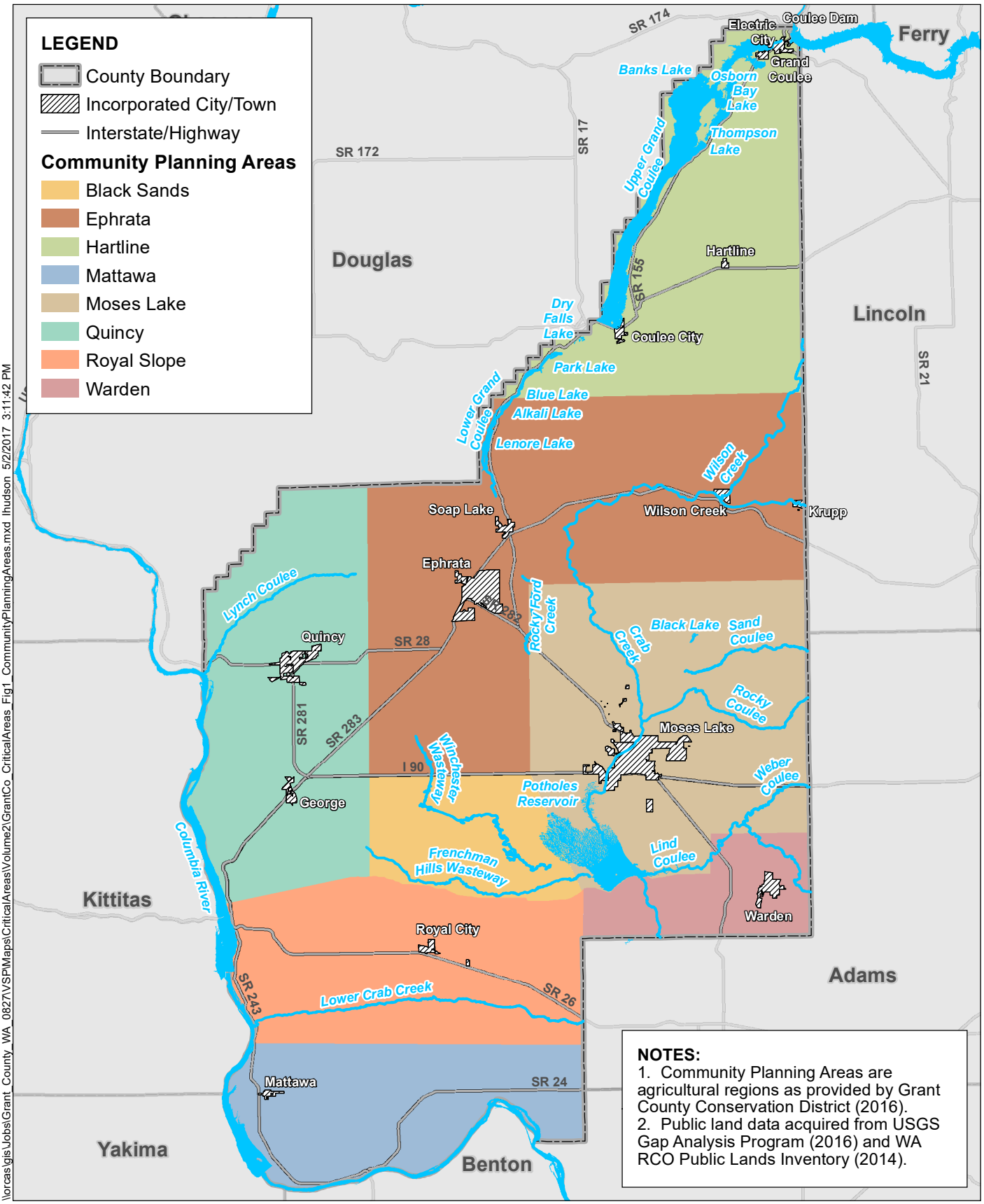

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Figure 1
Community Planning Areas
Voluntary Stewardship Program
Grant County, WA

Appendix B-2: Community Planning Areas: Black Sands

Black Sands Community Description

The Black Sands Community Planning Area is located in central Grant County, east of the Potholes Reservoir, and derives its name from the sandy soils that dominate in this area. A high level of management is needed for producers to farm the area, due to the community's fine sandy soils, low soil water-holding capacity, rapid water infiltration rates, and wind erosion susceptibility.

Profile

Water Resources

Water resources in this community are largely a result of water brought to the area as a part of the Columbia Basin Project (CBP). The western edge of the Potholes Reservoir is within this community, and the Frenchman Hills and Winchester wasteways pass through Black Sands, delivering CBP return flows to the Potholes Reservoir for reuse in southern portions of the CBP area.

Wetlands and lakes are primarily present along the wasteways and adjacent to the reservoir, and are largely associated with seepage from the CBP. The high rate of seepage from irrigation infrastructure and irrigation in this community has also created higher water tables in many areas.

Soils and Terrain

Soils are dominated by fine sandy soils with low water-holding capacity and high water infiltration rates. Soils throughout the community are also highly susceptible to wind erosion due to soil type and wind velocities. This area is part of the larger Quincy Basin, which is characterized by deep sediments overtop bedrock basalt that formed historically as a result of a draining lake (USBR 2002). In the recent past, winds have redeposited these sediments into a series of sandy dunes.

Agricultural Landcover and Primary Crops/Products

Approximately 44% of the Black Sands area is within agricultural landcover (private lands), primarily comprised of irrigated lands and rangelands. In 2015, primary crops produced in the community included row crops, such as potatoes, corn, wheat, alfalfa hay, and onions, and permanent crops, such as apples (WSDA 2015).

Landcover	Acres	Percent
Total Community Area	**89,662**	**NA**
Agricultural Landcover	**39,406**	**44%**
Irrigated	27,004	69%
Dryland	1,559	4%
Range	10,843	28%

The Black Sands Irrigation District was formed to take advantage of the CBP-influenced high water tables in this area for agricultural use. Producers draw water from shallow wells to support sprinkler irrigation systems making irrigation of the sandy soils possible. Additionally, proximity to processing and transportation make this a highly productive area of the Columbia Basin.

Location of Critical Areas

Fish and Wildlife Habitat Conservation Areas (HCAs), mapped as Priority Habitat and Species (PHS) within the Black Sands Community, intersect predominantly within publicly owned wildlife management areas, including the Desert Unit Wildlife Area. Approximately 16% of private agricultural lands include mapped PHS areas:

- Shrub-steppe PHS habitat occurs on 6,100 acres of agricultural lands
- Game species PHS habitat, primarily mule deer, occurs on 27,300 acres of agricultural lands
- Waterfowl habitat present mainly near the Frenchman Hills and Winchester wasteways, associated wetlands and lakes, and the Potholes Reservoir (large amount in the community but only 200 acres on agricultural lands)

Critical Aquifer Recharge Areas (CARAs) have limited mapped intersections with agricultural lands where public water supplies are mapped under wellhead protections areas. There is one public well in the Black Sands Community that does not have an associated wellhead protection area (EA 2017).

Other Critical Areas such as wetlands, water erosion potential areas, and frequently flooded areas have small intersections with agriculture in the Black Sands Community. Most wetlands in the community occur along Winchester and Frenchman Hills wasteways and in the margins between irrigated fields.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	42	<1%	40	3%	107	<1%	190	<1%
HCAs – Non-game Species	1,019	3%	178	<1%	5,083	13%	6,279	16%
HCAs – Game Species	17,160	64%	1,200	77%	8,905	82%	27,266	69%
CARAs	0	0%	0	0%	0	0%	0	0%
Geologic Hazards[3]	0	0%	1	<1%	4	<1%	5	<1%
Frequently Flooded Areas	69	<1%	40	<1%	32	<1%	140	<1%

1. Agricultural areas included in this summary are limited to privately owned lands.
2. Percentages are provided per agricultural type and total agricultural lands.
3. Only displaying water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential covers approximately 100% of the agricultural area in this community.

Critical Area Functions

Critical area functions, including water quality, habitat, soil, and hydrology are discussed below. This discussion focuses on existing functions (2011) and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the Black Sands Community are protected by the Desert Unit and Potholes Reservoir Unit Wildlife Areas or other public ownership for the CBP. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Much of the water quality functions in the community are managed by the Desert Unit and Potholes Reservoir Unit Wildlife Areas or other public ownership for the CBP. Publicly owned lands in the Black Sands Community also include the much of the Frenchman Hills and Winchester wasteways, and associated wetland and lakes, which help filter surface and groundwater inputs. In this community, Frenchman Hills Wasteway is listed on the Washington State Department of Ecology 303(d) List as Category 5 for dieldrin, pH, and temperature (Ecology 2016). • Riparian vegetation includes a mix of native and introduced trees and shrubs (WDFW 2006). These areas provide stream cover, which reduces temperatures and helps to filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located.
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities particularly for a variety of avian and terrestrial species. The shrub-steppe uplands are flanked by agricultural land use on all sides. The Desert Unit Wildlife Area also provides diverse areas of wetlands and desert upland. Riparian vegetation adjacent to the wasteways, wetlands, and lakes is naturally sparse and low-growing and includes a mix of native and introduced trees and shrubs (WDFW 2006). • **Aquatic habitat:** Streams are not a prominent feature in the Black Sands Community, instead a series of small ponds and wetlands along the Frenchman Hills and Winchester wasteways and in the margins between irrigated fields dominates the hydrology in this area. Riparian and wetland vegetation provides cover and food inputs for aquatic species. Invasive species (such as Russian olive and purple loosestrife) are prominent within wetlands (Anchor QEA 2013). • **Wildlife and habitat**: Priority species occurrences in the Black Sands Community include American white pelican, bald eagles, shorebirds, tundra swan, western grebe, and waterfowl concentrations. Game species include ring-necked pheasant, mule deer, and white-tailed jackrabbit.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland and stream-like habitat as water moves through topographic lows. • Soils are characterized as fine and sandy with high susceptibility to wind erosion. • The high rate of seepage from irrigation infrastructure and irrigation in this community has created higher water tables within shallow aquifers. • Potential for reduced groundwater quantity with irrigation water withdrawals within deep aquifers where connection with surface recharge is limited and occurs at low rates.

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Black Sands Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community's sandy soils have low water-holding and high water infiltration properties. The majority of the community includes soils with high infiltration rates where privately owned shallow wells (145 feet deep or less) are highly vulnerable to nitrate contamination (NRCS 2016).

Although wind erosion susceptibility areas are not designated critical areas, wind erosion can also affect soil health and agricultural viability, and has been identified as a management concern for this area as high wind erosion susceptibility areas are mapped within almost all of the community's agricultural lands (100%).

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage nutrients and pesticides effectively and efficiently • Manage irrigation water so it is delivered, scheduled, and/or applied efficiently • Manage deep aquifer water withdrawals for sustained availability of groundwater • Protect soils from water and wind erosion	• Water management • Nutrient management • Pest management • Residue management • Till management (direct seed) • Cover crop • Conservation cover	1,721 acres

Note:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Black Sands Community (see attached RWA).

References

Anchor QEA (Anchor QEA, LLC), 2013. Grant County Shoreline Master Program Update: Inventory, Analysis, and Characterization Report.

EA (EA Engineering, Science, and Technology, Inc. PBC), 2017. Grant County CARA and VSP. January 2017.

Ecology (Washington State Department of Ecology), 2016. Washington State Water Quality Assessment 303(d)/305(b) List Search Tool. Updated: July 22, 2016. Cited: March 15, 2017. Available from: https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx.

NRCS (Natural Resources Conservation Service), 2016. Grant County, Washington Map: Nitrate Vulnerability Map (With Wells) for Wells 145 Feet Deep. Provided by Harold Crose, Grant County Conservation District. June 24, 2016.

USBR (United States Bureau of Reclamation), 2002. Potholes Reservoir Resource Management Plan. August 2002. Available from: https://www.usbr.gov/pn/programs/rmp/potholes/rmp-potholes2002.pdf.

WDFW (Washington Department of Fish and Wildlife), 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Black Sands Community Planning Area Rapid Watershed Assessment Tables
- Black Sands Community Planning Area GIS Summary Table

Enter Watershed Variables Below

Watershed Name	Black Sands	Watershed Code	Blksan-1		
Landuse Type	Irrigated	Landuse Acres	40,785	Interest Rate	4%
Typical Unit Size (ac)	470	Percent TA of FA	30%	Cost-Share Rate	50%

Estimated Time Frame = 5 years

Participation Rate (Based on Watershed Profile): 5%

4% Calculated Participation Rate (Based on Projected Future Conditions)

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Baseline	73%	29,773	Baseline	96%	28,582	Baseline	70%	28,582	28,582	0
			Progressive	3%	893					
			RMS	1%	298					
			Must Total 100%	100%						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Progressive	26%	10,604	Progressive	95%	10,074	Progressive	27%	10,967	10,074	893
			RMS	5%	530					
			Must Total 100%	100%						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
RMS	1%	408	RMS	100%	408	RMS	3%	1,236	408	828
Grand Totals	100%	40,785					100%	40,785	39,064	1,721

WATERSHED NAME & CODE	BLACK SANDS - BLKSAN-1				LANDUSE ACRES		40,785	
LANDUSE TYPE	IRRIGATED				TYPICAL UNIT SIZE ACRES		470	
ASSESSMENT INFORMATION					CALCULATED PARTICIPATION		4%	
	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Wind	Water Quality – Excessive Nutrients and Organics in Groundwater	Fish and Wildlife – Habitat Fragmentation	Profitability - Change in Profitability
Baseline				**System Rating ->**	**1**	**0**	**0**	**0**
Irrigation System, Sprinkler (ac.) 442	29,773	28,582	0	28,582	2	0	0	-1
Total Acreage at Baseline	**29,773**	**28,582**	**0**	**28,582**				
Progressive				**System Rating ->**	**5**	**4**	**3**	**-1**
Conservation Cover (ac.) 327	106	101	9	110	5	1	5	-4
Cover Crop (ac.) 340	318	302	27	329	4	1	1	-1
Irrigation Water Management (ac.) 449	4,030	3,828	339	4,167	2	5	0	2
Nutrient Management (ac.) 590	10,604	10,074	893	10,967	1	5	1	1
Pest Management (ac.) 595	10,604	10,074	893	10,967	1	0	0	1
Residue and Tillage Management, Mulch Till (ac.) 345	106	101	9	110	4	-1	1	-1
Residue Management, Seasonal (ac.) 344	106	101	9	110	4	-1	1	-1
Total Acreage at Progressive Level	**10,604**	**10,074**	**893**	**10,967**				
RMS				**System Rating ->**	**3**	**0**	**0**	**0**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	408	408	828	1,236	5	-1	1	-1
Total Acreage at RMS Level	**408**	**408**	**828**	**1,236**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**89,662**	N/A
Agricultural Landcover	**39,406**	**44%**
Irrigated	27,004	69%
Dryland	1,559	4%
Range	10,843	28%

Analysis Unit: Black Sands

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		42	0%	40	0%	107	0%	190	0%
Fish and Wildlife Habitat Conservation Areas[1,2]		1,019	3%	178	0%	5,083	13%	6,279	16%
Critical Aquifer Recharge Areas		0	0%	0	0%	0	0%	0	0%
Geologic Hazards	Water Erosion	0	0%	1	0%	4	0%	5	0%
	Wind Erosion	26,980	68%	1,546	4%	10,809	27%	39,335	100%
Frequently Flooded Areas		69	0%	40	0%	32	0%	140	0%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**0**	**1%**	**0**	**0%**	**1**	**1%**	**1**	**2%**
Shorelines of the State	0		0		0		0	
Fish Use or Potential Fish Use	0		0		0		0	
No Fish Use	0		0		0		0	
Unknown	0		0		1		1	

Notes:
1. Streams data excludes irrigation canals

Black Sands

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**42**	**40**	**107**	**190**
Freshwater Emergent Wetland	30	34	101	164
Freshwater Forested/Shrub Wetland	1	0	0	2
Lake/Pond	11	5	5	21
Riverine	0	1	1	3
Other	0	0	0	0

Black Sands

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**1,019**	**178**	**5,083**	**6,279**
Birds	**33**	**84**	**86**	**203**
American White Pelican	0	0	0	0
Bald Eagle	0	0	0	0
Burrowing Owl	0	0	0	0
Clark's Grebe	0	0	0	0
Common Loon	0	0	0	0
Eared Grebe	0	0	0	0
Ferruginous Hawk	0	0	0	0
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	0	0
Loggerhead Shrike	0	0	0	0
Sage Grouse	0	0	0	0
Sandhill Crane	0	0	0	0
Sharp-tailed Grouse	0	0	0	0
Shorebird Concentrations	0	0	0	0
Tundra Swan	0	0	0	0
Western Grebe	0	0	0	0
Waterfowl Concentrations	33	84	86	203
Amphibians/Reptiles	**0**	**0**	**0**	**0**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	0	0	0
Cliffs/bluffs	**0**	**0**	**0**	**0**
Shrub-Steppe	**986**	**94**	**4,997**	**6,077**
Other Species and Habitats	**0**	**0**	**0**	**0**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	0	0
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Black Sands

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**17,160**	**1,201**	**8,905**	**27,266**
Birds	**5**	**5**	**10**	**19**
Barrow's Goldeneye	0	0	0	0
Chukar	0	0	0	0
Ring-necked Pheasant	5	5	10	19
Mammals	**17,160**	**1,200**	**8,905**	**27,266**
Mule Deer	17,160	1,200	8,905	27,266
Rocky Mountain Elk	0	0	0	0
White-tailed Jackrabbit	0	0	271	271

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Black Sands

Appendix B-2: Community Planning Areas: Ephrata

Ephrata Community Description

The Ephrata Community Planning Area is located in central Grant County, north of the Potholes Reservoir. This community is named after the City of Ephrata, the county seat of Grant County, and includes the area around Ephrata and the towns of Soap Lake and Wilson Creek. There are numerous orchards in this area, and primary crops grown here are hay and small grains, which mostly use water delivered by the Columbia Basin Project (CBP) west canal. Dryland wheat and rangeland occupy the remainder of the agricultural land within the community.

Profile

Water Resources

Water resources in this community are largely a result of water brought to the area as a part of the CBP. The CBP west canal runs from east to west through the middle of the community. Wasteways connect to the canal and carry water south through neighboring communities. There are several surface waters located in the northern part of the community, including Lenore Lake, Soap Lake, and Billy Clapp Lake. Upper Crab Creek is one of the few naturally occurring streams in Central Washington and runs through the east side of this community.

Wetlands are primarily present along the canal, wasteways, and lakes. They are present in the east side of the community within the Crab Creek watershed area. Most of the wetland features within this community are largely associated with seepage from the CBP.

Soils and Terrain

The western agricultural portion of the region is dominated by sandy and silty loams, with finer sands occurring in the south near the Winchester Wasteway and Black Sands. The eastern agricultural portion is also dominated by sandy and silty loams, with pockets of cobbly and gravelly loam. These soils are deep and well-drained, and in some cases, excessively drained (Gentry 1984). Soils throughout the community are also highly susceptible to wind erosion due to soil type, steep slopes, and wind velocities.

Agricultural Landcover and Primary Crops/Products

Approximately 79% of the community is within agricultural landcover (private lands), which primarily comprises rangelands with a nearly equal distribution of irrigated lands and dryland. In 2015, primary crops produced in the community included row crops such as potatoes, corn, wheat, alfalfa hay, grass hay, and Timothy hay, and permanent crops such as apples (WSDA 2015).

Landcover	Acres	Percent
Total Community Area	**411,341**	**NA**
Agricultural Landcover	**325,794**	**79%**
Irrigated	79,249	24%
Dryland	87,774	27%
Range	158,771	49%

The Quincy Columbia Basin Irrigation District delivers irrigation water from the CBP in this area for agricultural use. Most of the water is pumped from reservoirs such as Banks Lake to Billy Clapp Lake to cover the area. Producers draw water from canals to support sprinkler irrigation systems making irrigation of the well-drained soils possible. Additionally, proximity to processing and transportation make this a highly productive area of the Columbia Basin.

Location of Critical Areas

Fish and Wildlife Habitat Conservation Areas (HCAs), mapped as Priority Habitat and Species (PHS), intersect approximately 11% of private agricultural lands within the community. These mapped PHS areas include:

- Shrub-steppe PHS habitat overlapping 8,900 acres of agricultural lands
- Game species PHS habitat, primarily mule deer, overlapping 51,900 acres of agricultural lands
- PHS bird habitat, primarily sage grouse habitat, is primarily located near the northwest corner of the community and at Billy Clapp Lake in the north and the Winchester Wasteway to the south (overlapping approximately 25,700 acres of agricultural lands)

Critical Aquifer Recharge Areas (CARAs) have limited mapped intersections with agricultural lands where public water supplies are mapped under wellhead protections areas. In total, there are 28 public water system wells and 11 incorporated municipal supply system wells in the Ephrata Community (EA 2017).

Other Critical Areas such as wetlands and frequently flooded areas have small intersections with agriculture in the community. Most wetlands in the community occur near Billy Clapp Lake to the north, along the Winchester Wasteway to the south, and in the margins between irrigated fields.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	109	<1%	249	<1%	664	<1%	1,023	<1%
HCAs Non-game Species	181	<1%	21,471	7%	15,477	5%	37,128	11%
HCAs– Game Species	5,104	6%	16,603	19%	30,174	19%	51,881	16%
CARAs	1082	<1%	193	<1%	2,813	1%	4,088	1%
Geologic Hazards[3]	3,342	1%	29,834	9%	54,606	17%	87,782	27%
Frequently Flooded Areas	1,945	1%	1,881	1%	2,726	1%	6,553	2%

1. Agricultural areas included in this summary are limited to privately owned lands. Publicly owned land is not managed under VSP.
2. Percentages are provided per agricultural type and total agricultural lands.
3. This table only shows water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential areas overlap approximately 21% of the agricultural lands in this community.

Critical Area Functions

Critical area functions within the Ephrata Community, including water quality, habitat, soil and hydrology, are discussed below. This discussion focuses on existing functions as of the 2011 baseline and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the community are protected by publicly owned lands associated with the CBP. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Much of the areas where water quality functions occur are under public ownership for the CBP. Lakes and wetlands associated with these areas help filter surface and groundwater inputs. Crab Creek is listed on the Washington State Department of Ecology 303(d) List as Category 5 for dissolved oxygen, pH, and temperature; Lenore Lake outlet is listed for pH; and Rocky Ford Creek is listed for dissolved oxygen (Ecology 2016). • Riparian vegetation includes a mix of native and introduced trees and shrubs (WDFW 2006). These areas provide stream cover, which reduces temperatures and helps to filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located (NRCS 2016).
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities particularly for mule deer, and waterfowl, as well as other avian and terrestrial species. The shrub-steppe uplands are flanked by agricultural land use on all sides. Riparian vegetation adjacent to the lakes, wetlands, and wasteways is naturally sparse and low-growing and includes a mix of native and introduced trees and shrubs (WDFW 2006). • **Aquatic habitat:** Much of the aquatic habitat in the community occurs on the north side in proximity to Lenore Lake, Billy Clapp Lake, Crab Creek, Wilson Creek, and Rocky Ford Creek. In the southwest, aquatic habitat is mostly associated with the Winchester Wasteway. Riparian vegetation surrounding these waterbodies and nearby wetlands provides cover and food inputs for aquatic species. Invasive species (such as Russian olive and purple loosestrife) are prominent within wetlands. • **Species and habitats**: Priority species occurrences in the community include the American white pelican, western grebe, sage grouse, tundra swan, and waterfowl concentrations. Game species include ring-necked pheasant, chukar, and mule deer.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland and stream-like habitat as water moves through topographic lows. • Soils are characterized as fine and sandy with high susceptibility to wind erosion due to soil type, steep slopes, and wind velocities. • Potential for reduced groundwater quantity with irrigation water withdrawals within deep aquifers where connection with surface recharge is limited and occurs at low rates.

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Ephrata Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community's sandy and silty soils have low water-holding and high water infiltration properties. Indirect effects can be caused by erosion of nutrient-laden agricultural soils to nearby surface waters or seepage into shallow groundwater wells.

Although wind erosion susceptibility areas are not designated critical areas, wind erosion can affect soil health and agricultural viability. Therefore, wind erosion is identified as a management concern for this area as high wind erosion susceptibility areas are mapped within over 20% of the community's agricultural lands.

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage nutrients and pesticides effectively and efficiently • Manage irrigation water so it is delivered, scheduled and/or applied efficiently • Protect soils from water and wind erosion • Plan intensity, frequency, timing, and duration of grazing to be protective of critical areas	• Water management • Nutrient management • Pest management • Conservation cover • Till and Residue management • Direct seed • Upland wildlife habitat management • Prescribed grazing	5,185 acres[2]

Note:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Ephrata Community (see attached RWA).
2. Range management acres such as prescribed grazing are excluded from this implementation target. See Appendix B-9 for County-wide description on range management and implementation targets.

References

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Gentry, H.R., 1984. *Soil Survey Report of Grant County, Washington*. Prepared by the U.S. Department of Agriculture, Soil Conservation Service in cooperation with Washington State University, Agricultural Research Center. January 1984.

NRCS (Natural Resources Conservation Service), 2016. Grant County, Washington Map: Nitrate Vulnerability Map (With Wells) for Wells 145 Feet Deep. Provided by Harold Crose, Grant County Conservation District. June 24, 2016.

WDFW (Washington Department of Fish and Wildlife), 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Ephrata Community Planning Area Rapid Watershed Assessment Tables
- Ephrata Community Planning Area GIS Summary Table

Enter Watershed Variables Below

Watershed Name	*Ephrata*	Watershed Code	*EPH-1*		
Landuse Type	*Irrigated*	Landuse Acres	*283,320*	Interest Rate	*4%*
Typical Unit Size (ac)	*431*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*
Estimated Time Frame = 5 years	Participation Rate (Based on Watershed Profile) *6%*		2%	Calculated Participation Rate (Based on Projected Future Conditions)	

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Baseline	*84%*	237,989	Baseline	*98%*	233,229	Baseline	82%	233,229	233,229	0
			Progressive	*1%*	2,380					
			RMS	*1%*	2,380					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Progressive	*15%*	42,498	Progressive	*99%*	42,073	Progressive	16%	44,453	42,073	2,380
			RMS	*1%*	425					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
RMS	*1%*	2,833	RMS	100%	2,833	RMS	2%	5,638	2,833	2,805
Grand Totals	**100%**	**283,320**					**100%**	**283,320**	**278,135**	**5,185**

WATERSHED NAME & CODE	EPHRATA - EPH-1	LANDUSE ACRES	283,320
LANDUSE TYPE	IRRIGATED	TYPICAL UNIT SIZE ACRES	431
ASSESSMENT INFORMATION		CALCULATED PARTICIPATION	2%

	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Sheet and Rill	Soil Erosion – Irrigation induced	Water Quality – Excessive Nutrients and Organics in Groundwater	Profitability - Change in Profitability
Baseline				**System Rating ->**	**0**	**-1**	**0**	**0**
Irrigation System, Sprinkler (ac.) 442	85,676	83,962	0	83,962	0	0	0	-1
Irrigation System, Surface and Subsurface (ac.) 443	2,380	2,332	0	2,332	0	-2	0	-1
Total Acreage at Baseline	**237,989**	**233,229**	**0**	**233,229**				
Progressive				**System Rating ->**	**5**	**4**	**4**	**-1**
Conservation Cover (ac.) 327	35,273	34,921	1,975	36,896	5	5	1	-4
Cover Crop (ac.) 340	425	421	24	445	4	0	1	-1
Irrigation Water Management (ac.) 449	2,550	2,524	143	2,667	0	4	5	2
Nutrient Management (ac.) 590	10,200	10,098	571	10,669	1	0	5	1
Pest Management (ac.) 595	9,350	9,256	524	9,780	1	1	0	1
Residue and Tillage Management, Mulch Till (ac.) 345	425	421	24	445	4	4	-1	-1
Residue Management, Seasonal (ac.) 344	425	421	24	445	4	4	-1	-1
Total Acreage at Progressive Level	**42,498**	**42,073**	**2,380**	**44,453**				
RMS				**System Rating ->**	**3**	**3**	**0**	**0**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	227	227	224	451	5	5	-1	-1
Upland Wildlife Habitat Management (ac.) 645	57	57	56	113	0	0	0	-1
Total Acreage at RMS Level	**2,833**	**2,833**	**2,805**	**5,638**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**411,341**	N/A
Agricultural Landcover	**325,794**	**79%**
Irrigated	79,249	24%
Dryland	87,774	27%
Range	158,771	49%

Analysis Unit: Ephrata

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		109	0%	249	0%	664	0%	1,023	0%
Fish and Wildlife Habitat Conservation Areas[1,2]		181	0%	21,471	7%	15,477	5%	37,128	11%
Critical Aquifer Recharge Areas		1,082	0%	193	0%	2,813	1%	4,088	1%
Geologic Hazards	Water Erosion	3,342	1%	29,834	9%	54,606	17%	87,782	27%
	Wind Erosion	42,492	13%	11,787	4%	15,753	5%	70,031	21%
Frequently Flooded Areas		1,945	1%	1,881	1%	2,726	1%	6,553	2%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**67**	**8%**	**230**	**29%**	**324**	**41%**	**621**	**78%**
Shorelines of the State	2		7		22		31	
Fish Use or Potential Fish Use	0		0		0		0	
No Fish Use	0		0		0		0	
Unknown	65		223		302		590	

Notes:
1. Streams data excludes irrigation canals

Ephrata

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**109**	**249**	**664**	**1,023**
Freshwater Emergent Wetland	85	153	238	477
Freshwater Forested/Shrub Wetland	3	6	14	23
Lake/Pond	21	72	224	317
Riverine	0	5	157	162
Other	0	13	32	44

Ephrata

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**181**	**21,471**	**15,477**	**37,128**
Birds	**64**	**19,838**	**5,810**	**25,712**
American White Pelican	0	12	22	35
Bald Eagle	0	0	0	0
Burrowing Owl	11	2	8	22
Clark's Grebe	0	0	0	0
Common Loon	0	0	0	0
Eared Grebe	0	0	4	4
Ferruginous Hawk	0	0	0	0
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	8	8
Loggerhead Shrike	0	0	0	0
Sage Grouse	0	19,458	5,296	24,754
Sandhill Crane	0	0	0	0
Sharp-tailed Grouse	0	0	0	0
Shorebird Concentrations	28	23	32	83
Tundra Swan	0	12	22	35
Western Grebe	0	0	0	0
Waterfowl Concentrations	25	353	474	852
Amphibians/Reptiles	**0**	**0**	**0**	**0**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	0	0	0
Cliffs/bluffs	**0**	**21**	**2,521**	**2,543**
Shrub-Steppe	**117**	**1,611**	**7,145**	**8,873**
Other Species and Habitats	**0**	**0**	**0**	**0**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	0	0
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Ephrata

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**5,104**	**16,603**	**30,174**	**51,881**
Birds	**2,470**	**1,996**	**9,127**	**13,593**
Barrow's Goldeneye	0	0	4	4
Chukar	287	324	6,480	7,091
Ring-necked Pheasant	2,183	1,672	2,643	6,498
Mammals	**5,029**	**16,340**	**25,839**	**47,208**
Mule Deer	5,029	16,340	25,839	47,208
Rocky Mountain Elk	0	0	0	0
White-tailed Jackrabbit	0	0	0	0

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Ephrata

Appendix B-2: Community Planning Areas: Hartline

Hartline Community Description

The Hartline Community Planning Area is the northernmost community in Grant County. This Community Planning Area is named after the Town of Hartline, located in the center of the community, and also includes the area surrounding the towns of Coulee City, Coulee Dam, and Electric City. Due to low precipitation and limited irrigation service from the Columbia Basin Project (CBP), dryland agriculture is the dominant cropland in the Hartline Community Planning Area, and dryland winter wheat is the primary agricultural crop. The nature of dryland farming makes it susceptible to erosion, especially from wind erosion. Because healthy topsoil is critical to sustainable dryland agriculture, its preservation is generally considered the most important long-term goal of a dryland farming operation from an agricultural viability perspective.

Profile

Water Resources

Water resources in this community are largely shaped by the CBP. Banks Lake, located on the west side of the community, serves as the initial storage reservoir for the area. Other lakes in the community include Osborne Bay Lake, Thompson Lake, Dry Falls Lake, Park Lake, and Blue Lake. Several creeks and tributaries run throughout the community, including Northrup Creek, Devils Creek, Rusho Creek, Ladds Creek, Lower Lewis Creek, Meadow Creek, and Wilson Creek. The CBP main canal moves water between the south end of Banks Lake to the north end of Billy Clapp Lake.

Wetlands are primarily present along the lakes and streams located in the north half of the community near Banks Lake, to the south along CBP facilities, and around limited irrigated lands.

Soils and Terrain

This region is dominated by sandy and silty loam. These soils are deep and well-drained, and in some cases, excessively drained (Gentry 1984). Soils throughout the community are also highly susceptible to wind erosion due to soil type, steep slopes, and wind velocities.

Agricultural Landcover and Primary Crops/Products

Landcover	Acres	Percent
Total Community Area	**258,310**	**NA**
Agricultural Landcover	**177,331**	**69%**
Irrigated	8,978	5%
Dryland	113,166	64%
Range	55,187	31%

Approximately 69% of the community is within agricultural landcover (private lands), primarily comprising dryland and rangeland. In 2015, primary crops produced in the community included grain and hay (WSDA 2015). Most of the water for the irrigated lands in the Hartline Community Planning Area is pumped from the Banks Lake Reservoir.

Location of Critical Areas

Fish and Wildlife Habitat Conservation Areas (HCA), mapped as Priority Habitat and Species (PHS), intersect approximately 15% of private agricultural lands within the community. These mapped PHS areas include:

- Shrub-steppe PHS habitat overlapping 650 acres of agricultural lands
- Game species PHS habitat, primarily mule deer, overlapping 41,800 acres of agricultural lands
- PHS bird habitat, primarily sage grouse habitat, is generally located near the north portion of the area near Banks Lake (overlapping 24,500 acres of agricultural lands)

Critical Aquifer Recharge Areas (CARAs) have limited mapped intersections with agricultural lands where public water supplies are mapped under wellhead protections areas. In total, there are 14 public water system wells and 7 incorporated municipal supply system wells in the Hartline Community (EA 2017).

Other Critical Areas such as wetlands and frequently flooded areas have small intersections with agriculture in the community.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	0	0%	569	<1%	546	<1%	602	<1%
HCAs – Non-game Species	31	<1%	7,807	4%	18,644	11%	26,482	15%
HCAs – Game Species	148	2%	16,984	15%	24,670	45%	41,801	24%
CARA	0	0%	224	<1%	83	0%	307	<1%
Geologic Hazards[3]	716	<1%	51,424	29%	9,720	5%	61,860	35%
Frequently Flooded Areas	819	<1%	2,447	1%	1,151	1%	4,418	2%

1. Agricultural areas included in this summary are limited to privately owned lands.
2. Percentages are provided per agricultural type and total agricultural lands.
3. This table only shows water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential areas overlap 9% of the agricultural lands in this community.

Critical Area Functions

Critical area functions within the Hartline Community, including water quality, habitat, soil and hydrology, are discussed below. This discussion focuses on existing functions as of the 2011 baseline and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the community are protected by publicly owned lands associated with the CBP. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Many of the water quality functions in the community are under public ownership by the CBP. Lakes and wetlands associated with these areas help filter surface and groundwater inputs. In this community, there are no Category 5 water quality listings on the Washington State Department of Ecology 303(d) List (Ecology 2016). • Riparian vegetation includes a mix of native and introduced trees and shrubs (WDFW 2006). These areas provide stream cover, which reduces temperatures and helps filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located (NRCS 2016).
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities particularly for sage-grouse, mule deer, and waterfowl, as well as other avian and terrestrial species. The shrub-steppe uplands are flanked by agricultural land use on all sides. Riparian vegetation adjacent to the lakes and wetlands is naturally sparse and low-growing and includes a mix of native and introduced trees and shrubs (WDFW 2006). • **Aquatic habitat:** Much of the aquatic habitat in the community occurs on the west side in proximity to Banks Lake and series of lakes to the south. Riparian vegetation surrounding these waterbodies and nearby wetlands provides cover and food inputs for aquatic species. Invasive species (such as Russian olive and purple loosestrife) are prominent within wetlands. • **Wildlife and habitat**: Priority species occurrences in the community include bald eagle, common loon, sage grouse, and waterfowl concentrations. Game species include chukar, mule deer, and Rocky Mountain elk.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland and stream-like habitat as water moves through topographic lows. • Soils are characterized as fine and sandy with high susceptibility to wind erosion due to soil type, steep slopes, and wind velocities.

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Hartline Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community's sandy and silty soils have low water-holding and high water infiltration properties. Indirect effects can be caused by erosion of nutrient-laden agricultural soils to nearby surface waters or seepage into shallow groundwater wells.

Water erosion detaches and removes soil and can affect soil health and agricultural viability. Therefore, water erosion is identified as a management concern for this area as severe water erosion areas are mapped within 35% of the community's agricultural lands, primarily occurring in the north portion of the community.

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage irrigation water so it is delivered, scheduled, and/or applied efficiently • Protect soils from water and wind erosion • Plan intensity, frequency, timing, and duration of grazing to manage groundcover and plant density to maintain infiltration capacity and to reduce runoff	• Nutrient management • Pest management • Residue management • Direct seed • Upland wildlife habitat management • Prescribed grazing	7,595 acres[2]

Notes:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Hartline Community (see attached RWA).
2. Range management acres such as prescribed grazing are excluded from this implementation target. See Appendix B-7 for County wide description on range management and implementation targets.

References

EA (EA Engineering, Science, and Technology, Inc. PBC), 2017. Grant County CARA and VSP. January 2017.

Ecology (Washington State Department of Ecology), 2016. Washington State Water Quality Assessment 303(d)/305(b) List Search Tool. Updated: July 22, 2016. Cited: March 15, 2017. Available from: https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx.

Gentry, H.R., 1984. *Soil Survey Report of Grant County, Washington*. Prepared by the U.S. Department of Agriculture, Soil Conservation Service in cooperation with Washington State University, Agricultural Research Center. January 1984.

NRCS (Natural Resources Conservation Service), 2016. Grant County, Washington Map: Nitrate Vulnerability Map (With Wells) for Wells 145 Feet Deep. Provided by Harold Crose, Grant County Conservation District. June 24, 2016.

WDFW (Washington Department of Fish and Wildlife), 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Hartline Community Planning Area Rapid Watershed Assessment Tables
- Hartline Community Planning Area GIS Summary Table

Enter Watershed Variables Below

Watershed Name	*Hartline*	Watershed Code	*Hart-1*		
Landuse Type	*Dry Cropland*	Landuse Acres	*185,248*	Interest Rate	*4%*
Typical Unit Size (ac)	*970*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*

Estimated Time Frame = 5 years

Participation Rate (Based on Watershed Profile): *4%*

4% Calculated Participation Rate (Based on Projected Future Conditions)

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Baseline	*70%*	129,674	Baseline	*98%*	127,080	Baseline	69%	127,080	127,080	0
			Progressive	*1%*	1,297					
			RMS	*1%*	1,297					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Progressive	*27%*	50,017	Progressive	*99%*	49,517	Progressive	27%	50,814	49,517	1,297
			RMS	*10%*	5,002					
			Must Total 100%	*109%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
RMS	*3%*	5,557	RMS	100%	5,557	RMS	6%	11,856	5,557	6,298
Grand Totals	**100%**	**185,248**					**102%**	**189,750**	**182,154**	**7,595**

WATERSHED NAME & CODE	HARTLINE - HART-1	LANDUSE ACRES	185,248
LANDUSE TYPE	DRY CROPLAND	TYPICAL UNIT SIZE ACRES	970
ASSESSMENT INFORMATION		CALCULATED PARTICIPATION	4%

	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Sheet and Rill	Soil Erosion – Wind	Fish and Wildlife – Habitat Fragmentation	Capital - Change in Equipment
Baseline				**System Rating ->**	**2**	**2**	**0**	**1**
Residue Management, Seasonal (ac.) 344	97,255	95,310	0	95,310	4	4	1	2
Total Acreage at Baseline	**129,674**	**127,080**	**0**	**127,080**				
Progressive				**System Rating ->**	**3**	**3**	**3**	**0**
Conservation Cover (ac.) 327	21,007	20,797	545	21,342	5	5	5	-2
Nutrient Management (ac.) 590	4,502	4,457	117	4,573	1	1	1	1
Pest Management (ac.) 595	3,501	3,466	91	3,557	1	1	0	2
Total Acreage at Progressive Level	**50,017**	**49,517**	**1,297**	**50,814**				
RMS				**System Rating ->**	**3**	**3**	**3**	**1**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	2,334	2,334	2,645	4,979	5	5	1	2
Upland Wildlife Habitat Management (ac.) 645	500	500	567	1,067	0	0	5	1
Total Acreage at RMS Level	**5,557**	**5,557**	**6,298**	**11,856**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**258,310**	N/A
Agricultural Landcover	**177,331**	**69%**
Irrigated	8,978	5%
Dryland	113,166	64%
Range	55,187	31%

Analysis Unit: Hartline

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		0	0%	56	0%	546	0%	602	0%
Fish and Wildlife Habitat Conservation Areas[1,2]		31	0%	7,807	4%	18,644	11%	26,482	15%
Critical Aquifer Recharge Areas		0	0%	224	0%	83	0%	307	0%
Geologic Hazards	Water Erosion	716	0%	51,424	29%	9,720	5%	61,860	35%
	Wind Erosion	2,485	1%	11,750	7%	2,182	1%	16,417	9%
Frequently Flooded Areas		819	0%	2,447	1%	1,151	1%	4,418	2%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**23**	**4%**	**314**	**50%**	**123**	**20%**	**460**	**73%**
Shorelines of the State	0		0		2		3	
Fish Use or Potential Fish Use	0		1		1		1	
No Fish Use	0		0		1		1	
Unknown	23		313		119		455	

Notes:
1. Streams data excludes irrigation canals

Hartline

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**0**	**56**	**546**	**602**
Freshwater Emergent Wetland	0	45	359	405
Freshwater Forested/Shrub Wetland	0	0	10	11
Lake/Pond	0	8	148	156
Riverine	0	0	4	4
Other	0	2	24	27

Hartline

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**31**	**7,807**	**18,644**	**26,482**
Birds	**31**	**7,516**	**16,987**	**24,534**
American White Pelican	0	0	0	0
Bald Eagle	0	0	19	19
Burrowing Owl	0	0	0	0
Clark's Grebe	0	0	0	0
Common Loon	0	0	4	4
Eared Grebe	0	0	0	0
Ferruginous Hawk	0	0	0	0
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	0	0
Loggerhead Shrike	0	0	0	0
Sage Grouse	31	7,514	16,954	24,500
Sandhill Crane	0	0	0	0
Sharp-tailed Grouse	0	0	1	1
Shorebird Concentrations	0	0	0	0
Tundra Swan	0	0	0	0
Western Grebe	0	0	0	0
Waterfowl Concentrations	0	3	14	16
Amphibians/Reptiles	**0**	**0**	**0**	**0**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	0	0	0
Cliffs/bluffs	**0**	**8**	**2,354**	**2,362**
Shrub-Steppe	**0**	**297**	**357**	**654**
Other Species and Habitats	**0**	**0**	**0**	**0**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	0	0
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Hartline

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**148**	**16,984**	**24,670**	**41,801**
Birds	**0**	**1**	**2,445**	**2,446**
Barrow's Goldeneye	0	0	0	0
Chukar	0	1	2,445	2,446
Ring-necked Pheasant	0	0	0	0
Mammals	**148**	**16,983**	**23,451**	**40,582**
Mule Deer	148	16,981	23,448	40,577
Rocky Mountain Elk	0	2	40	42
White-tailed Jackrabbit	0	0	0	0

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Hartline

Appendix B-2: Community Planning Areas: Mattawa

Mattawa Community Description

The Mattawa Community Planning Area is the southernmost area in Grant County. This Community Planning Area is named after the Town of Mattawa, located on the west side of the community, and includes the Town of Desert Aire. The Columbia Basin Project (CBP) delivers water to hay, orchards, fruit trees, and potatoes. Saddle Mountain lies to the north and is home to large rangeland ranches.

Profile

Water Resources

Water resources in this community are largely a result of water brought to the area as a part of the CBP, or direct diversions out of the Columbia River. The Columbia River borders the west and south boundaries of the community. Moran Slough, Saddle Mountain Lake, and Saddle Mountain Wasteway are major surface waters located along the south side of the community adjacent to the Columbia River. A network of CBP canals run through the east half of the community, supporting a variety of agricultural uses.

Wetlands are primarily present along the canal, wasteways, and lakes and are present in the east side of the community within the Crab Creek watershed area. Most of the wetland features within this community are largely associated with seepage from the CBP.

Soils and Terrain

Soils in the southern agricultural portion of the region are dominated by fine sands. The northern agricultural portion is dominated by a mix of sandy and silty loams. These soils are deep and well-drained (Gentry 1984). Soils throughout the community are also highly susceptible to water and wind erosion community-wide due to soil type and steep slopes.

Agricultural Landcover and Primary Crops/Products

Approximately 35% of the community is within agricultural landcover (private lands), primarily comprising dryland and rangeland.

Landcover	Acres	Percent
Total Community Area	**162,546**	**NA**
Agricultural Landcover	**56,894**	**35%**
Irrigated	42,410	75%
Dryland	3,919	7%
Range	10,565	19%

In 2015, primary crops produced in the community included asparagus, berries, beans, corn, grains, grapes, onions, potatoes, and hay (WSDA 2015). Most of the water is pumped from the Columbia River to serve the area. Producers draw water from canals or the Columbia River to support irrigation systems used for a variety of crops, including center pivot, drip, rill, and sprinkler systems.

Location of Critical Areas

Fish and Wildlife Habitat Conservation Areas (HCAs), mapped as Priority Habitat and Species (PHS), intersect approximately 3% of private agricultural lands within the community. These mapped PHS areas include:

- Shrub-steppe PHS habitat overlapping 1,200 acres of agricultural lands
- Game species PHS habitat, primarily chukar and ring-necked pheasant, overlapping 840 acres of agricultural lands
- Bird habitat, primarily bald eagle habitat, is primarily located near the Columbia River to the south (overlapping 550 acres of agricultural lands)

Critical Aquifer Recharge Areas (CARAs) have limited mapped intersections with agricultural lands where public water supplies are mapped under wellhead protections areas. In total, there are 11 public water system wells and 3 incorporated municipal supply system wells in the Mattawa Community (EA 2017).

Other Critical Areas such as wetlands and frequently flooded areas have small intersections with agriculture in the community. Most wetlands occur in the southeast near Saddle Mountain Lake.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	12	<1%	25	<1%	127	<1%	164	<1%
HCAs – Non-game Species	388	1%	63	4%	1,425	3%	1,876	3%
HCAs – Game Species	33	<1%	15	<1%	790	7%	838	2%
CARA	209	<1%	20	<1%	102	<1%	331	1%
Geologic Hazards[3]	304	1%	42	29%	2,812	5%	3,158	6%
Frequently Flooded Areas	41	<1%	26	<1%	354	1%	420	1%

1. Agricultural areas included in this summary are limited to privately owned lands.
2. Percentages are provided per agricultural type and total agricultural lands.
3. This table only shows water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential areas overlap a significant amount of agricultural lands in this community, totaling approximately 91%.

Critical Area Functions

Critical area functions within the Mattawa Community, including water quality, habitat, soil and hydrology, are discussed below. This discussion focuses on existing functions as of the 2011 baseline and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the community are protected by publicly owned lands associated with the CBP and the Hanford Reach National Monument. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Many of the water quality functions in the community are located on the Columbia River or under public ownership by the CBP or the Hanford Reach National Monument. Lakes and wetlands associated with these areas help filter surface and groundwater inputs. In this community, the Columbia River and Saddle Mountain Wasteway are listed on the Washington State Department of Ecology 303(d) List (Ecology 2016) as Category 5 for pH and temperature. The Mattawa Drain and Priest Rapids Wasteway are also listed for pH, temperature, and dissolved oxygen. The Wahluke Branch 10 Wasteway is listed for pH, temperature, and bacteria. • Riparian vegetation includes a mix of native and introduced trees and shrubs (WDFW 2006). These areas provide stream cover, which reduces temperatures and helps to filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located (NRCS 2016).
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities particularly for mule deer, and waterfowl, as well as other avian and terrestrial species. The shrub-steppe uplands are flanked by agricultural land use on all sides. Riparian vegetation adjacent to the lakes, wetlands, and wasteways is naturally sparse and low-growing and includes a mix of native and introduced trees and shrubs (WDFW 2006). • **Aquatic habitat:** Much of the aquatic habitat in the community occurs on the west side in proximity to Banks Lake and series of lakes to the south. Riparian vegetation surrounding these waterbodies and nearby wetlands provides cover and food inputs for aquatic species. Invasive species (such as Russian olive and purple loosestrife) are prominent within wetlands. • **Wildlife and habitat**: Priority species occurrences in the community include bald eagle, common loon, sage grouse, and waterfowl concentrations. Game species include chukar, mule deer, and Rocky Mountain elk.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland and stream-like habitat as water moves through topographic lows • Soils are characterized as fine and sandy with high susceptibility to wind erosion due to soil type, steep slopes, and wind velocities.

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Mattawa Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community's sandy and silty soils have low water-holding and high water infiltration properties. Indirect effects can be caused by erosion of nutrient-laden agricultural soils to nearby surface waters or seepage into shallow groundwater wells.

Although wind erosion susceptibility areas are not designated critical areas, wind erosion can affect soil health and also agricultural viability, and so it has been identified as a management concern for this area as high wind erosion susceptibility areas are mapped within almost all of the community's agricultural lands (91%).

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage nutrients and pesticides effectively and efficiently • Manage irrigation water so it is delivered, scheduled, and/or applied efficiently • Protect soils from water and wind erosion • Plan intensity, frequency, timing, and duration of grazing to manage groundcover and plant density to maintain infiltration capacity and reduce runoff	• Water management • Nutrient management • Pest management • Conservation cover • Cover crop • Residue management • Direct seed • Upland wildlife habitat management • Prescribed grazing	2,758 acres[2]

Notes:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Mattawa Community (see attached RWA).
2. Range management acres such as prescribed grazing are excluded from this implementation target. See Appendix B-9 for County-wide description on range management and implementation targets.

References

EA (EA Engineering, Science, and Technology, Inc. PBC), 2017. Grant County CARA and VSP. January 2017.

Ecology (Washington State Department of Ecology), 2016. Washington State Water Quality Assessment 303(d)/305(b) List Search Tool. Updated: July 22, 2016. Cited: March 15, 2017. Available from: https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx.

Gentry, H.R., 1984. *Soil Survey Report of Grant County, Washington*. Prepared by the U.S. Department of Agriculture, Soil Conservation Service in cooperation with Washington State University, Agricultural Research Center. January 1984.

NRCS (Natural Resources Conservation Service), 2016. Grant County, Washington Map: Nitrate Vulnerability Map (With Wells) for Wells 145 Feet Deep. Provided by Harold Crose, Grant County Conservation District. June 24, 2016.

WDFW (Washington Department of Fish and Wildlife), 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Mattawa Community Planning Area Rapid Watershed Assessment Tables
- Mattawa Community Planning Area GIS Summary Table

Enter Watershed Variables Below

Watershed Name	*Mattawa*	Watershed Code	*Mat-1*		
Landuse Type	*Irrigated*	Landuse Acres	*67,919*	Interest Rate	*4%*
Typical Unit Size (ac)	*328*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*

Estimated Time Frame = 5 years

Participation Rate (Based on Watershed Profile): *5%*

4% Calculated Participation Rate (Based on Projected Future Conditions)

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Baseline	*89%*	60,448	Baseline	*96%*	58,030	Baseline	85%	58,030	58,030	0
			Progressive	*3%*	1,813					
			RMS	*1%*	604					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Progressive	*10%*	6,792	Progressive	*95%*	6,452	Progressive	12%	8,266	6,452	1,813
			RMS	*5%*	340					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
RMS	*1%*	679	RMS	100%	679	RMS	2%	1,623	679	944
Grand Totals	**100%**	**67,919**					**100%**	**67,919**	**65,161**	**2,758**

WATERSHED NAME & CODE	MATTAWA - MAT-1	LANDUSE ACRES	67,919
LANDUSE TYPE	IRRIGATED	TYPICAL UNIT SIZE ACRES	328
ASSESSMENT INFORMATION		CALCULATED PARTICIPATION	4%

	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Wind	Water Quality – Excessive Nutrients and Organics in Groundwater	Fish and Wildlife – Habitat Fragmentation	Profitability - Change in Profitability
Baseline				**System Rating ->**	**1**	**0**	**0**	**0**
Irrigation System, Sprinkler (ac.) 442	48,963	47,004	0	47,004	2	0	0	-1
Total Acreage at Baseline	**60,448**	**58,030**	**0**	**58,030**				
Progressive				**System Rating ->**	**5**	**4**	**3**	**-1**
Conservation Cover (ac.) 327	68	65	18	83	5	1	5	-4
Cover Crop (ac.) 340	68	65	18	83	4	1	1	-1
Irrigation Water Management (ac.) 449	3,328	3,162	889	4,050	2	5	0	2
Nutrient Management (ac.) 590	4,415	4,194	1,179	5,373	1	5	1	1
Pest Management (ac.) 595	4,211	4,000	1,124	5,125	1	0	0	1
Residue and Tillage Management, Mulch Till (ac.) 345	68	65	18	83	4	-1	1	-1
Residue Management, Seasonal (ac.) 344	68	65	18	83	4	-1	1	-1
Total Acreage at Progressive Level	**6,792**	**6,452**	**1,813**	**8,266**				
RMS				**System Rating ->**	**3**	**0**	**3**	**0**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	68	68	94	162	5	-1	1	-1
Upland Wildlife Habitat Management (ac.) 645	136	136	189	325	0	0	5	-1
Total Acreage at RMS Level	**679**	**679**	**944**	**1,623**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**162,546**	N/A
Agricultural Landcover	**56,894**	**35%**
Irrigated	42,410	75%
Dryland	3,919	7%
Range	10,565	19%

Analysis Unit: Mattawa

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		12	0%	25	0%	127	0%	164	0%
Fish and Wildlife Habitat Conservation Areas[1,2]		388	1%	63	0%	1,425	3%	1,876	3%
Critical Aquifer Recharge Areas		209	0%	20	0%	102	0%	331	1%
Geologic Hazards	Water Erosion	304	1%	42	0%	2,812	5%	3,158	6%
	Wind Erosion	39,857	70%	3,493	6%	8,140	14%	51,490	91%
Frequently Flooded Areas		41	0%	26	0%	354	1%	420	1%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**9**	**3%**	**11**	**3%**	**25**	**8%**	**45**	**14%**
Shorelines of the State	0		0		0		0	
Fish Use or Potential Fish Use	0		0		0		0	
No Fish Use	0		0		0		1	
Unknown	9		11		24		44	

Notes:
1. Streams data excludes irrigation canals

Mattawa

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**12**	**25**	**127**	**164**
Freshwater Emergent Wetland	0	2	15	17
Freshwater Forested/Shrub Wetland	0	0	5	5
Lake/Pond	10	18	64	92
Riverine	2	4	44	49
Other	0	0	0	0

Mattawa

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**388**	**63**	**1,425**	**1,876**
Birds	**202**	**50**	**298**	**550**
American White Pelican	0	0	0	0
Bald Eagle	31	18	179	228
Burrowing Owl	0	0	0	0
Clark's Grebe	0	0	0	0
Common Loon	0	2	13	16
Eared Grebe	0	0	0	0
Ferruginous Hawk	128	11	10	149
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	0	0
Loggerhead Shrike	0	0	0	0
Sage Grouse	0	0	0	0
Sandhill Crane	0	0	0	0
Sharp-tailed Grouse	0	0	0	0
Shorebird Concentrations	0	0	0	0
Tundra Swan	0	0	0	0
Western Grebe	0	0	0	0
Waterfowl Concentrations	43	21	109	173
Amphibians/Reptiles	**0**	**0**	**0**	**0**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	0	0	0
Cliffs/bluffs	**0**	**0**	**160**	**160**
Shrub-Steppe	**186**	**13**	**992**	**1,191**
Other Species and Habitats	**0**	**0**	**0**	**0**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	0	0
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Mattawa

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**33**	**15**	**790**	**838**
Birds	**33**	**15**	**790**	**838**
Barrow's Goldeneye	0	0	0	0
Chukar	3	3	623	629
Ring-necked Pheasant	30	12	167	209
Mammals	**0**	**0**	**0**	**0**
Mule Deer	0	0	0	0
Rocky Mountain Elk	0	0	0	0
White-tailed Jackrabbit	0	0	0	0

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Mattawa

Appendix B-2: Community Planning Areas: Moses Lake

Moses Lake Community Description

The Moses Lake Community Planning Area is located in central Grant County, north of the Potholes Reservoir. This Community Planning Area is named after the City of Moses Lake. Columbia Basin Project (CBP) water is used to assist in the growing of agricultural crops, maintaining landscapes, and revegetating disturbed soils in dry areas and during periods of inadequate rainfall. A variety of irrigated crops are grown, with hay being one of the top production crops.

Profile

Water Resources

Water resources in this community are largely a result of water brought to the area as a part of the CBP. There are several surface waters located in the west side of the community, including the Potholes Reservoir, Moses Lake, Rocky Ford Creek, Crab Creek, and Black Lake. A wasteway and coulees run through the east side of the community, including the Rocky Coulee wasteway and Lind Coulee, Sand Coulee, Rocky Coulee, and Weber Coulee.

Wetlands are primarily present along the lakes, creeks, canals, coulees, and wasteways with the larger wetland complexes occurring around the Potholes Reservoir, Rocky Ford Creek, and Crab Creek. Multiple, smaller wetland features within this community are associated with seepage from the CBP.

Soils and Terrain

Soils in the western agricultural portion of the region are dominated by sandy loam, with finer sands dominating the southern portion near the Potholes Reservoir and Black Sands. The eastern agricultural portion of the region is dominated by silty loam. These soils are deep and well-drained, and in some cases, excessively drained (Gentry 1984). Soils throughout the community are also highly susceptible to wind erosion due to soil type, steep slopes, and wind velocities.

Agricultural Landcover and Primary Crops/Products

Approximately 73% of the community is within agricultural landcover (private lands), primarily comprising irrigated lands and rangeland. In 2015, primary crops produced in the community included beans, hay, onion, garlic, seeds, small grains, corn, mint, and sunflower, and orchard crops such as apples, cherries, and grapes (WSDA 2015).

Landcover	Acres	Percent
Total Community Area	**299,128**	**NA**
Agricultural Landcover	**218,157**	**73%**
Irrigated	101,431	46%
Dryland	47,104	22%
Range	69,622	32%

The Quincy Columbia Basin Irrigation District delivers irrigation water from the CBP in this area for agricultural use. Producers draw water from canals to support sprinkler irrigation systems making irrigation of the well-drained soils possible. Additionally, proximity to processing and transportation make this a highly productive area of the Columbia Basin.

Location of Critical Areas

Fish and Wildlife Habitat Conservation Areas (HCAs), mapped as Priority Habitat and Species (PHS), intersect approximately 4% of private agricultural lands within the community. These mapped PHS areas include:

- Shrub-steppe PHS habitat overlapping approximately 5,300 acres of agricultural lands
- Game species PHS habitat, primarily ring-necked pheasant, overlapping 770 acres of agricultural lands
- PHS bird habitat, primarily waterfowl habitat, is located near the west side of the community at the Potholes Reservoir and extends up near Moses Lake and Rocky Ford Creek (overlapping 2,500 acres of agricultural lands)

Critical Aquifer Recharge Areas (CARAs) have limited mapped intersections with agricultural lands where public water supplies are mapped under wellhead protections areas. In total, there are 66 public water system wells and 16 incorporated municipal supply system wells in the Moses Lake Community (EA 2017).

Other Critical Areas such as wetlands and frequently flooded areas have small intersections with agriculture in the community. Most wetlands occur around the Potholes Reservoir, Rocky Ford Creek, and Crab Creek and in the margins between irrigated fields.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	335	<1%	753	<1%	956	<1%	2,044	1%
HCAs – Non-game Species	957	<1%	1,204	1%	5,585	3%	7,745	4%
HCAs – Game Species	121	<1%	274	<1%	378	<1%	774	<1%
CARAs	4,822	2%	1,341	1%	2,422	1%	8,585	4%
Geologic Hazards[3]	2,838	1%	3,711	2%	21,273	10%	27,823	13%
Frequently Flooded Areas	1,483	1%	1,488	1%	2,954	1%	5,926	3%

1. Agricultural areas included in this summary are limited to privately owned lands.
2. Percentages are provided per agricultural type and total agricultural lands.
3. This table only shows water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential areas overlap approximately 26% of the agricultural lands in this community.

Critical Area Functions

Critical area functions within the Moses Lake Community, including water quality, habitat, soil and hydrology, are discussed below. This discussion focuses on existing functions as of the 2011 baseline and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the community are protected by publicly owned lands associated with the CBP. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Many of the water quality functions in the community are under public ownership by the CBP. Lakes and wetlands associated with these areas help filter surface and groundwater inputs. In this community, Crab Creek and the Rocky Coulee Wasteway are listed on the Washington State Department of Ecology 303(d) List as Category 5 for pH and temperature; Rocky Ford Creek is listed for temperature and dissolved oxygen; the Rocky Coulee Wasteway Drain is listed for pH; and, the Lind Coulee is listed for bacteria, temperature, and pH (Ecology 2016). • Riparian vegetation includes a mix of native and introduced trees and shrubs (WDFW 2006). These areas provide stream cover, which reduces temperatures and helps to filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located.
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities particularly for mule deer, and waterfowl, as well as other avian and terrestrial species. The shrub-steppe uplands are flanked by agricultural land use on all sides. Riparian vegetation adjacent to the lakes, creeks, canals, coulees, and wasteways is naturally sparse and low-growing and includes a mix of native and introduced trees and shrubs (WDFW 2006). • **Aquatic habitat:** Much of the aquatic habitat in the community occurs on the west side in proximity to Potholes Reservoir, Moses Lake, Rocky Ford Creek, and Crab Creek. In the east, aquatic habitat is mostly associated with canals, coulees, and wasteways. Riparian vegetation surrounding these waterbodies and nearby wetlands provides cover and food inputs for aquatic species. Invasive species (such as Russian olive and purple loosestrife) are prominent within wetlands. • **Species and habitats**: Priority species occurrences in the community include: the American white pelican, Clark's grebe, loggerhead shrike, tundra swan, and shorebird and waterfowl concentrations. Game species include ring-necked pheasant and mule deer.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland and riparian habitat in some areas where water moves through topographic lows. Additionally two natural streams, Rocky Ford and Crab creeks, also provide flow. Crab Creek flow has recently been enhanced through CBP operational improvements. • Soils are characterized as fine and sandy with high susceptibility to wind erosion due to soil type, steep slopes, and wind velocities. • Potential for reduced groundwater quantity with irrigation water withdrawals within deep aquifers where connection with surface recharge is limited and occurs at low rates (NRCS 2016).

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Moses Lake Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community's sandy and silty soils have low water-holding and high water infiltration properties. Indirect effects can be caused by erosion of nutrient-laden agricultural soils to nearby surface waters or seepage into shallow groundwater wells.

Although wind erosion susceptibility areas are not designated critical areas, wind erosion can affect soil health and agricultural viability. Therefore, wind erosion is identified as a management concern for this area as high wind erosion susceptibility areas are mapped within more than 26% of the community's agricultural lands.

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage nutrients and pesticides effectively and efficiently • Manage irrigation water so it is delivered, scheduled, and/or applied efficiently • Manage deep aquifer water withdrawals for sustained availability of groundwater • Protect soils from irrigation-induced erosion	• Water management • Nutrient management • Pest management • Conservation cover • Cover crop • Residue management • Direct seed • Upland wildlife habitat management	5,032 acres[2]

Notes:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Moses Lake Community (see attached RWA).
2. Range management acres such as prescribed grazing are excluded from this implementation target. See Appendix B-9 for County-wide description on range management and implementation targets.

References

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Gentry, H.R., 1984. *Soil Survey Report of Grant County, Washington*. Prepared by the U.S. Department of Agriculture, Soil Conservation Service in cooperation with Washington State University, Agricultural Research Center. January 1984.

NRCS (Natural Resources Conservation Service), 2016. Grant County, Washington Map: Nitrate Vulnerability Map (With Wells) for Wells 145 Feet Deep. Provided by Harold Crose, Grant County Conservation District. June 24, 2016.

WDFW (Washington Department of Fish and Wildlife), 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Moses Lake Community Planning Area Rapid Watershed Assessment Tables
- Moses Lake Community Planning Area GIS Summary Table

Enter Watershed Variables Below

Watershed Name	*Moses Lake*	Watershed Code	*ML-1*		
Landuse Type	*Irrigated*	Landuse Acres	*179,075*	Interest Rate	*4%*
Typical Unit Size (ac)	*322*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*

Estimated Time Frame = 5 years

Participation Rate (Based on Watershed Profile): *6%*

3% Calculated Participation Rate (Based on Projected Future Conditions)

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Baseline	*91%*	162,958	Baseline	*97%*	158,070	Baseline	88%	158,070	158,070	0
			Progressive	*2%*	3,259					
			RMS	*1%*	1,630					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Progressive	*8%*	14,326	Progressive	*99%*	14,183	Progressive	10%	17,442	14,183	3,259
			RMS	*1%*	143					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
RMS	*1%*	1,791	RMS	100%	1,791	RMS	2%	3,564	1,791	1,773
Grand Totals	**100%**	**179,075**					**100%**	**179,075**	**174,043**	**5,032**

WATERSHED NAME & CODE	MOSES LAKE - ML-1	LANDUSE ACRES	179,075
LANDUSE TYPE	IRRIGATED	TYPICAL UNIT SIZE ACRES	322
ASSESSMENT INFORMATION		CALCULATED PARTICIPATION	3%

	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Wind	Water Quantity – Inefficient Water Use on Irrigated Land	Water Quantity – Aquifer Overdraft	Profitability - Change in Profitability
Baseline				**System Rating ->**	**1**	**2**	**2**	**0**
Irrigation System, Sprinkler (ac.) 442	104,293	101,164	0	101,164	2	4	3	-1
Irrigation System, Surface and Subsurface (ac.) 443	6,518	6,323	0	6,323	2	0	2	-1
Total Acreage at Baseline	**162,958**	**158,070**	**0**	**158,070**				
Progressive				**System Rating ->**	**4**	**3**	**2**	**-1**
Conservation Cover (ac.) 327	14,326	14,183	3,259	17,442	5	0	0	-4
Cover Crop (ac.) 340	143	142	33	174	4	0	0	-1
Irrigation Water Management (ac.) 449	1,862	1,844	424	2,267	2	5	4	2
Nutrient Management (ac.) 590	10,888	10,779	2,477	13,256	1	1	0	1
Pest Management (ac.) 595	11,174	11,063	2,542	13,605	1	1	0	1
Residue Management, Seasonal (ac.) 344	143	142	33	174	4	1	0	-1
Total Acreage at Progressive Level	**14,326**	**14,183**	**3,259**	**17,442**				
RMS				**System Rating ->**	**3**	**1**	**0**	**0**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	90	90	89	178	5	2	0	-1
Upland Wildlife Habitat Management (ac.) 645	1,164	1,164	1,152	2,316	0	0	0	-1
Total Acreage at RMS Level	**1,791**	**1,791**	**1,773**	**3,564**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**299,128**	N/A
Agricultural Landcover	**218,157**	**73%**
Irrigated	101,431	46%
Dryland	47,104	22%
Range	69,622	32%

Analysis Unit: Moses Lake

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		335	0%	753	0%	956	0%	2,044	1%
Fish and Wildlife Habitat Conservation Areas[1,2]		957	0%	1,204	1%	5,585	3%	7,745	4%
Critical Aquifer Recharge Areas		4,822	2%	1,341	1%	2,422	1%	8,585	4%
Geologic Hazards	Water Erosion	2,838	1%	3,711	2%	21,273	10%	27,823	13%
	Wind Erosion	34,127	16%	10,699	5%	11,963	5%	56,789	26%
Frequently Flooded Areas		1,483	1%	1,488	1%	2,954	1%	5,926	3%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**120**	**22%**	**140**	**26%**	**123**	**23%**	**383**	**72%**
Shorelines of the State	0		0		6		6	
Fish Use or Potential Fish Use	1		0		1		2	
No Fish Use	0		0		0		0	
Unknown	119		139		117		375	

Notes:
1. Streams data excludes irrigation canals

Moses Lake

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**335**	**753**	**956**	**2,044**
Freshwater Emergent Wetland	275	645	531	1,452
Freshwater Forested/Shrub Wetland	2	5	7	14
Lake/Pond	56	94	195	344
Riverine	0	8	217	225
Other	1	1	6	8

Moses Lake

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**957**	**1,204**	**5,585**	**7,745**
Birds	**938**	**485**	**1,019**	**2,442**
American White Pelican	1	32	46	78
Bald Eagle	0	0	49	49
Burrowing Owl	0	0	13	13
Clark's Grebe	1	32	46	78
Common Loon	0	0	0	0
Eared Grebe	0	0	0	0
Ferruginous Hawk	0	0	0	0
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	0	0
Loggerhead Shrike	0	30	165	196
Sage Grouse	0	0	0	0
Sandhill Crane	0	0	0	0
Sharp-tailed Grouse	0	0	0	0
Shorebird Concentrations	31	249	450	729
Tundra Swan	0	0	0	0
Western Grebe	0	0	0	0
Waterfowl Concentrations	938	454	841	2,233
Amphibians/Reptiles	**0**	**0**	**0**	**0**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	0	0	0
Cliffs/bluffs	**0**	**0**	**0**	**0**
Shrub-Steppe	**19**	**719**	**4,579**	**5,317**
Other Species and Habitats	**0**	**0**	**0**	**0**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	0	0
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Moses Lake

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**121**	**274**	**378**	**774**
Birds	**120**	**270**	**190**	**581**
Barrow's Goldeneye	0	0	0	0
Chukar	0	0	0	0
Ring-necked Pheasant	120	270	190	581
Mammals	**1**	**14**	**198**	**214**
Mule Deer	1	14	198	214
Rocky Mountain Elk	0	0	0	0
White-tailed Jackrabbit	0	0	0	0

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Moses Lake

Appendix B-2: Community Planning Areas: Quincy

Quincy Community Description

The Quincy Community Planning Area is located in western Grant County, bordering the Columbia River to the west and Douglas County to the north. This Community has one community within its boundary—Quincy. The West Canal, which has a capacity of 5,100 cubic feet per second, skirts the northwest periphery of the planning area. At the north end of Soap Lake, the canal is carried through the world`s largest inverted siphon.

Profile

Water Resources

Water resources in this community are largely a result of water brought to the area as a part of the CBP. The CBP west canal runs through most the central and southern portions of the community. Wasteways connect to the canal and carry water through neighboring communities. There are several surface waters located in the central part of the community, which are known as the Quincy Lakes.

Wetlands are primarily present along the canal, wasteways, and lakes. Many of these are found in publicly owned areas or are associated with seepage from the CBP.

Soils and Terrain

Soils range from gravelly loam in the norther portion, silty and sandy loam along the western border, and fine sand in the southeast. Areas with fine sandy soils are also highly susceptible to wind erosion. Most of the community sits on the relatively flat Columbia Plateau; however, the north portion consists of hills with deep channels.

Agricultural Landcover and Primary Crops/Products

Approximately 76% of the community is within agricultural landcover (private lands), primarily comprising irrigated lands with a nearly equal distribution of rangeland and dryland. Primary crops produced in the community include alfalfa, wheat, soybeans, mint, potatoes, sweet corn, grain corn, livestock, apples, cherries, peaches, apricots, oats, barley, wine grapes, beans, sugar beets, carrots, squash, watermelon, and other specialty crops (WSDA 2015).

Landcover	Acres	Percent
Total Community Area	**249,591**	**NA**
Agricultural Landcover	**189,779**	**76%**
Irrigated	100,846	53%
Dryland	37,881	20%
Range	51,052	27%

The soil and climatic conditions are favorable to the growth of more than 60 different crops annually. Additionally, dairy farming and beef production are significant in the area.

If you eat fast food the french fries were likely produced in the Quincy region, which has large agricultural processing facilities.

Location of Critical Areas

Fish and Wildlife Habitat Conservation Areas (HCA), mapped as Priority Habitat and Species (PHS), intersect approximately 19% of private agricultural lands within the community. These mapped PHS areas include:

- Sage Grouse habitat is abundant in the community, occurring in 24,879 acres of dryland and rangeland habitat
- Shrub-steppe PHS habitat overlapping 9,666 acres of agricultural lands
- Game species PHS habitat, primarily mule deer, overlaps 51,944 acres of agricultural lands

Critical Aquifer Recharge Areas (CARAs) have limited mapped intersections with agricultural lands where public water supplies are mapped under wellhead protections areas. In total, there are 26 public water system wells in the Quincy Community. Of those wells, 10 are supplied from deep aquifers and 16 are supplied from shallow aquifers (EA 2017).

Water Erosion Potential is concentrated mainly along the Columbia River where slopes are higher and more susceptible to erosion.

Other Critical Areas such as wetlands and frequently flooded areas have small intersections with agriculture in the community. Most wetlands in the community occur near the Quincy Lakes and along irrigation channels.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	95	<1%	153	<1%	196	<1%	445	<1%
HCAs – Non-game Species	1,047	1%	12,546	7%	21,917	12%	35,510	19%
HCAs – Game Species	3,471	3%	19,041	50%	29,492	32%	51,944	27%
CARAs	2,655	1%	492	<1%	702	<1%	3,849	2%
Geologic Hazards[3]	1,827	1%	15,341	8%	29,292	15%	46,459	24%
Frequently Flooded Areas	106	<1%	316	<1%	507	<1%	929	<1%

1. Agricultural areas included in this summary are limited to privately owned lands. Publicly owned land is not managed under VSP.
2. Percentages are provided per agricultural type and total agricultural lands.
3. This table only shows water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential areas overlap approximately 48% of the agricultural lands in this community.

Critical Area Functions

Critical area functions within the Quincy Community, including water quality, habitat, soil and hydrology, are discussed below. This discussion focuses on existing functions as of the 2011 baseline and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the community are protected by publicly owned lands. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Much of the surface water quality functions in the community are managed through the CBP. In this community, numerous wasteways have 303(d) listings for dissolved oxygen, temperature, and pH (Ecology 2016). Publicly owned lands in the Quincy Community contain wetlands and lakes, which help filter surface and groundwater inputs. • Riparian vegetation is limited in agricultural areas; however, in uncultivated portions of the community, riparian vegetation appears healthy and consists of grasses and shrubs. These areas provide stream cover, which reduces temperatures and helps filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located, mainly in the central eastern portion of the community (NRCS 2016).
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities particularly for mule deer, and waterfowl, as well as other avian and terrestrial species. Shrub-steppe habitat in this region is concentrated along the Columbia River in the southwest corner of the community. Riparian vegetation is limited in agricultural areas; however, in uncultivated portions of the community, riparian vegetation appears healthy and consists of grasses and shrubs. • **Aquatic habitat:** Most natural streams in this community are concentrated in the northern hilly terrain. Most of these are classified as unknown; however, many of them appear to have characteristics of a stream, which is unlike the rest of the county where these are mostly mapped topographic lows. The Quincy Area streams do appear to be ephemeral and would only contain water during large storm events. • **Species and habitats**: The community is a major waterfowl migration route, and wetlands are used by numerous species. Much of the Priority Wildlife Habitat in the Quincy Community is concentrated along the Columbia River, including mule deer, chukar, common loon, sage grouse, and waterfowl. Upland areas in this region have scattered patches of long-billed curlew, red-necked pheasant, and waterfowl. There is also excellent hunting; pheasant is a favorite upland game bird and is stocked throughout the area.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland habitats. • Soils in the central eastern portion of the community are characterized as fine and sandy with high susceptibility to wind erosion due to soil type, steep slopes, and wind velocities. • Potential for reduced groundwater quantity with irrigation water withdrawals within deep aquifers where connection with surface recharge is limited and occurs at low rates.

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Quincy Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community's soils range in water-holding capacity and water infiltration rates. Indirect effects can be caused by erosion of nutrient-laden agricultural soils to nearby surface waters or seepage into shallow groundwater wells.

Although wind erosion susceptibility areas are not designated critical areas, wind erosion can affect soil health and agricultural viability. Therefore, wind erosion is identified as a management concern for this area as moderate to high wind erosion susceptibility areas are mapped within more than 48% of the community's agricultural lands.

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage nutrients and pesticides effectively and efficiently • Manage irrigation water so it is delivered, scheduled and/or applied efficiently to reduce water use and erosion • Protect soils from water and wind erosion • Plan intensity, frequency, timing, and duration of grazing to manage groundcover and plant density to maintain infiltration capacity and reduce runoff	• Water management • Nutrient management • Pest management • Conservation cover • Cover crop • Residue management • Direct seed • Polyacrylamide • Upland wildlife management • Prescribed grazing	4,745 acres[2]

Notes:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Quincy Community (see attached RWA).
2. Range management acres such as prescribed grazing are excluded from this implementation target. See Appendix B-9 for County-wide description on range management and implementation targets.

References

EA (EA Engineering, Science, and Technology, Inc. PBC), 2017. Grant County CARA and VSP. January 2017.

Ecology (Washington State Department of Ecology), 2016. Washington State Water Quality Assessment 303(d)/305(b) List Search Tool. Updated: July 22, 2016. Cited: March 15, 2017. Available from: https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx.

NRCS (Natural Resources Conservation Service), 2016. Grant County, Washington Map: Nitrate Vulnerability Map (With Wells) for Wells 145 Feet Deep. Provided by Harold Crose, Grant County Conservation District. June 24, 2016.

WDFW (Washington Department of Fish and Wildlife), 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Quincy Community Planning Area Rapid Watershed Assessment Tables
- Quincy Community Planning Area GIS Summary Table

Enter Watershed Variables Below

Watershed Name	*Quincy*	Watershed Code	*Q-1*		
Landuse Type	*Irrigated-Dryland*	Landuse Acres	*176,404*	Interest Rate	*4%*
Typical Unit Size (ac)	*350*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*

Estimated Time Frame = 5

Participation Rate (Based on Watershed Profile): *5%*

3% Calculated Participation Rate (Based on Projected Future Conditions)

Current Conditions			Projected Change			Projected Future Condition				
								Acres		
System	Percent	Acres	System	Percent	Acres	System	Percent	Total	Static	Treated
Baseline	*85%*	149,943	Baseline	*97%*	145,445	Baseline	82%	145,445	145,445	0
			Progressive	*2%*	2,999					
			RMS	*1%*	1,499					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
								Acres		
System	Percent	Acres	System	Percent	Acres	System	Percent	Total	Static	Treated
Progressive	*14%*	24,697	Progressive	*99%*	24,450	Progressive	16%	27,448	24,450	2,999
			RMS	*1%*	247					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
								Acres		
System	Percent	Acres	System	Percent	Acres	System	Percent	Total	Static	Treated
RMS	*1%*	1,764	RMS	100%	1,764	RMS	2%	3,510	1,764	1,746
Grand Total:	**100%**	**176,404**					**100%**	**176,404**	**171,659**	**4,745**

WATERSHED NAME & CODE	QUINCY - Q-1				LANDUSE ACRES			176,404
LANDUSE TYPE	IRRIGATED-DRYLAND				TYPICAL UNIT SIZE ACRES			350
ASSESSMENT INFORMATION					CALCULATED PARTICIPATION			3%
	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Irrigation induced	Water Quality – Excessive Nutrients and Organics in Groundwater	Fish and Wildlife – Habitat Fragmentation	Profitability - Change in Profitability
Baseline				**System Rating ->**	**-1**	**0**	**0**	**0**
Irrigation System, Sprinkler (ac.) 442	92,965	90,176	0	90,176	0	0	0	-1
Irrigation System, Surface and Subsurface (ac.) 443	17,993	17,453	0	17,453	-2	0	0	-1
Total Acreage at Baseline	**149,943**	**145,445**	**0**	**145,445**				
Progressive				**System Rating ->**	**5**	**4**	**3**	**0**
Anionic Polyacrylamide (PAM) Erosion Control (ac.) 450	247	244	30	274	3	-1	0	2
Conservation Cover (ac.) 327	15,065	14,914	1,829	16,744	5	1	5	-4
Cover Crop (ac.) 340	741	733	90	823	0	1	1	-1
Irrigation Water Management (ac.) 449	6,668	6,601	810	7,411	4	5	0	2
Nutrient Management (ac.) 590	10,373	10,269	1,260	11,528	0	5	1	1
Pest Management (ac.) 595	7,656	7,579	930	8,509	1	0	0	1
Residue and Tillage Management, Mulch Till (ac.) 345	247	244	30	274	4	-1	1	-1
Residue Management, Seasonal (ac.) 344	247	244	30	274	4	-1	1	-1
Total Acreage at Progressive Level	**24,697**	**24,450**	**2,999**	**27,448**				
RMS				**System Rating ->**	**3**	**0**	**3**	**0**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	353	353	349	702	5	-1	1	-1
Upland Wildlife Habitat Management (ac.) 645	1,200	1,200	1,188	2,387	0	0	5	-1
Total Acreage at RMS Level	**1,764**	**1,764**	**1,746**	**3,510**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**249,591**	N/A
Agricultural Landcover	**189,779**	**76%**
Irrigated	100,846	53%
Dryland	37,881	20%
Range	51,052	27%

Analysis Unit: Quincy

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		95	0%	153	0%	196	0%	445	0%
Fish and Wildlife Habitat Conservation Areas[1,2]		1,047	1%	12,546	7%	21,917	12%	35,510	19%
Critical Aquifer Recharge Areas		2,655	1%	492	0%	702	0%	3,849	2%
Geologic Hazards	Water Erosion	1,827	1%	15,341	8%	29,292	15%	46,459	24%
	Wind Erosion	65,416	34%	13,444	7%	12,156	6%	91,015	48%
Frequently Flooded Areas		106	0%	316	0%	507	0%	929	0%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**30**	**6%**	**117**	**22%**	**207**	**39%**	**354**	**67%**
Shorelines of the State	0		0		0		0	
Fish Use or Potential Fish Use	0		0		1		1	
No Fish Use	0		0		0		0	
Unknown	30		117		206		353	

Notes:
1. Streams data excludes irrigation canals

Quincy

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**95**	**153**	**196**	**445**
Freshwater Emergent Wetland	69	131	80	279
Freshwater Forested/Shrub Wetland	2	3	13	18
Lake/Pond	24	10	31	64
Riverine	1	10	73	83
Other	0	0	0	0

Quincy

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**1,047**	**12,546**	**21,917**	**35,510**
Birds	**212**	**12,180**	**13,724**	**26,116**
American White Pelican	0	0	0	0
Bald Eagle	0	0	0	0
Burrowing Owl	0	0	0	0
Clark's Grebe	0	0	0	0
Common Loon	0	1	2	3
Eared Grebe	0	0	0	0
Ferruginous Hawk	0	0	0	0
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	0	0
Loggerhead Shrike	0	0	0	0
Sage Grouse	0	11,855	13,024	24,879
Sandhill Crane	1	0	1	2
Sharp-tailed Grouse	0	0	0	0
Shorebird Concentrations	0	0	0	0
Tundra Swan	0	0	0	0
Western Grebe	0	0	0	0
Waterfowl Concentrations	212	325	700	1,237
Amphibians/Reptiles	**0**	**0**	**0**	**0**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	0	0	0
Cliffs/bluffs	**0**	**4**	**422**	**425**
Shrub-Steppe	**916**	**501**	**8,249**	**9,666**
Other Species and Habitats	**0**	**0**	**182**	**182**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	182	182
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Quincy

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**3,411**	**19,041**	**29,492**	**51,944**
Birds	**481**	**1,735**	**7,665**	**9,881**
Barrow's Goldeneye	0	0	0	0
Chukar	224	1,631	7,301	9,156
Ring-necked Pheasant	257	104	365	725
Mammals	**3,342**	**18,885**	**28,037**	**50,264**
Mule Deer	3,342	18,885	28,037	50,264
Rocky Mountain Elk	0	0	0	0
White-tailed Jackrabbit	0	0	0	0

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Quincy

Appendix B-2: Community Planning Areas: Royal Slope

Royal Slope Community Description

The Royal Slope Community Planning Area covers an area some 30 miles long between the Columbia River and Adams County line. The area is about 12 miles wide and spans from the north side of Frenchman Hills to the top of Saddle Mountain in the south, with Lower Crab Creek flowing along the base of Saddle Mountain to the Columbia River. The origin of the name Royal Slope is obscure; one story has it that some early settlers, admiring the broad, south-facing landscape, deemed it a royal slope for farming.

Profile

Water Resources

The main waterbody in this community is Lower Crab Creek. Much of Crab Creek is publicly owned and within the Columbia National Wildlife Refuge and the Lower Crab Creek Unit of the Columbia Basin Wildlife Area. The Columbia River Basin Project (CBP) has a large influence on the hydrology of Crab Creek though irrigation return flows contributing surface water to this system (WDFW 2004).

Other water resources in this community are largely a result of water brought to the area as a part of the CBP. A network of CBP canals runs through the northern portion of the community, supporting a variety of agricultural uses.

Wetlands are primarily present along within Crab Creek watershed area. Other wetland features within this community are largely associated with seepage from the CBP.

Soils and Terrain

Soils are dominated by fine sandy and silty loam, which are deep and well-drained (Gentry 1984). Soils throughout the community are also moderately to highly susceptible to wind erosion due to soil type and wind velocity. Additionally, areas near Crab Creek have severe water erosion potential due to steep slopes.

Agricultural Landcover and Primary Crops/Products

Approximately 65% of the community is within agricultural landcover (private lands), primarily comprising irrigated and rangeland.

Landcover	Acres	Percent
Total Community Area	**217,287**	**NA**
Agricultural Landcover	**141,483**	**65%**
Irrigated	92,039	65%
Dryland	14,155	10%
Range	35,289	25%

This small farming community is well known for producing a wide variety of crops, including apples, cherries, peaches, timothy and alfalfa hay, melons, potatoes, onions, wine grapes, pears, mint, and corn (WSDA 2015). The Columbia Basin Irrigation Project west canal delivers water to sprinkler irrigation systems, which is the primary method of irrigating crops.

Location of Critical Areas

Fish and Wildlife Habitat Conservation Areas (HCAs), mapped as Priority Habitat and Species (PHS), intersect approximately 3% of private agricultural lands within the community. These mapped PHS areas include:

- Shrub-steppe PHS habitat has the largest individual interest with agriculture, occurring on 3,943 acres of agricultural lands almost entirely within rangelands
- Sandhill crane PHS habitat also has a large interest with agriculture, occurring on 2,007 acres of agricultural lands mainly within irrigated areas
- Game species PHS habitat, primarily chukar and ring-necked pheasant, occur on 8,649 acres of agricultural lands

Critical Aquifer Recharge Areas (CARAs) have limited mapped intersections with agricultural lands where public water supplies are mapped under wellhead protections areas. In total, there are 17 public water system wells in the Warden Community. Of those wells, 7 are supplied from deep aquifers and 10 are supplied from shallow aquifers (EA 2017).

Water Erosion Potential is concentrated mainly along Crab Creek where slopes are higher and more susceptible to surface flow and erosion.

Other Critical Areas such as wetlands and frequently flooded areas have small intersections with agriculture in the community. Most wetlands occur in the vicinity of Saddle Mountain.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	829	1%	853	1%	470	0%	2,151	2%
HCAs – Non-game Species	1,525	1%	437	<1%	5,104	4%	7,065	5%
HCAs – Game Species	652	<1%	171	1%	8,009	23%	8,833	6%
CARAs	591	<1%	116	<1%	235	<1%	942	1%
Geologic Hazards[3]	7,190	5%	2,044	1%	15,992	11%	25,226	18%
Frequently Flooded Areas	1,198	1%	659	<1%	632	<1%	2,489	2%

1. Agricultural areas included in this summary are limited to privately owned lands.
2. Percentages are provided per agricultural type and total agricultural lands.
3. This table only shows water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential areas overlap a significant amount of agricultural lands in this community, totaling approximately 81%.

Critical Area Functions

Critical area functions within the Royal Slope Community, including water quality, habitat, soil and hydrology, are discussed below. This discussion focuses on existing functions as of the 2011 baseline and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the community are protected by publicly owned lands. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Much of the water quality functions in the community are managed by the Columbia National Wildlife Refuge and the Lower Crab Creek Unit of the Columbia Basin Wildlife Area. In this community, Crab Creek and tributaries to Crab Creek are listed on the Washington State Department of Ecology 303(d) List as Category 5 for dieldrin, 4,4'-DDE, pH, and temperature (Ecology 2016). • Riparian vegetation limited in agricultural areas; however, in protected areas, riparian vegetation consists of native grasses and shrubs (WDFW 2006). These areas provide stream cover, which reduces temperatures and helps filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located. These are mainly located in the northern portion of the community.
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities particularly for mule deer, and waterfowl, as well as other avian and terrestrial species. Shrub-steppe habitat is prevalent along Crab Creek with much of it protected. Natural streams are not common in this community, and riparian vegetation is mostly found adjacent to Crab Creek and are characterized by native grasses and shrubs (WDFW 2006). • **Aquatic habitat:** The portion of Crab Creek flowing through Royal Slope Community is the only portion of the creek known to have anadromous fall Chinook salmon and steelhead. Adult steelhead are known to spawn in Crab Creek in the spring, and fall Chinook salmon spawn there in the fall (WDFW 2004). • **Wildlife and habitat**: The Royal Slope Community is a popular place for birders. The area is renowned for viewing migratory sandhill cranes, which feed on aftermath from harvested fields on the Royal Slope before they migrate in the fall. Waterfowl, chukar partridge, and red-necked pheasant use the Lower Crab Creek valley and uplands. The Lower Crab Creek area has cliff and bluff habitat. A diverse range of species uses habitat along the Columbia River, including waterfowl, shorebirds, common loon, mule deer, amphibians, and reptiles. In particular, striped whipsnake may be found along the Columbia River, North of the Wanapum Dam. Shrub steppe habitat is found along Lower Crab Creek and the Columbia River.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland and stream-like habitat as water moves through topographic lows • Soils are characterized as fine and sandy with high susceptibility to wind erosion due to soil type, steep slopes, and wind velocities. • Potential for reduced groundwater quantity with irrigation water withdrawals within deep aquifers where connection with surface recharge is limited and occurs at low rates.

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Royal Slope Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community's sandy and silty soils have low water-holding and high water infiltration properties. Indirect effects can be caused by erosion of nutrient-laden agricultural soils to nearby surface waters or seepage into shallow groundwater wells.

Although wind erosion susceptibility areas are not designated critical areas, wind erosion can affect soil health and also agricultural viability, and so it has been identified as a management concern for this area as high wind erosion susceptibility areas are mapped within almost all of the community's agricultural lands (81%).

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage nutrients and pesticides effectively and efficiently • Manage irrigation water so it is delivered, scheduled, and/or applied efficiently to reduce water use and erosion • Manage deep aquifer water withdrawals for sustained availability of groundwater • Protect soils from wind erosion • Manage livestock to minimize stream back erosion	• Water management • Nutrient management • Pest management • Residue management • Conservation cover • Cover crop • Direct seed • Polyacrylamide • Upland wildlife habitat management	4,121 acres

Note:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Royal Slope Community (see attached RWA).

References

EA (EA Engineering, Science, and Technology, Inc. PBC), 2017. Grant County CARA and VSP. January 2017.

Ecology (Washington State Department of Ecology), 2016. Washington State Water Quality Assessment 303(d)/305(b) List Search Tool. Updated: July 22, 2016. Cited: March 15, 2017. Available from: https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx.

Gentry, H.R., 1984. *Soil Survey Report of Grant County, Washington*. Prepared by the U.S. Department of Agriculture, Soil Conservation Service in cooperation with Washington State University, Agricultural Research Center. January 1984.

WDFW (Washington Department of Fish and Wildlife), 2004. Crab Creek Subbasin Plan. Prepared by: KWA Ecological Sciences Inc. May 2004.

WDFW, 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Royal Slope Community Planning Area Rapid Watershed Assessment Tables
- Royal Slope Community Planning Area GIS Summary Table

Enter Watershed Variables Below

Watershed Name	*Royal Slope*	Watershed Code	*RoySlo_1*		
Landuse Type	*Irrigated*	Landuse Acres	*144,586*	Interest Rate	*4%*
Typical Unit Size (ac)	*370*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*
Estimated Time Frame = 5 years	Participation Rate (Based on Watershed Profile) *3%*	*3%*	Calculated Participation Rate (Based on Projected Future Conditions)		

Current Conditions			Projected Change			Projected Future Condition				
								Acres		
System	Percent	Acres	System	Percent	Acres	System	Percent	Total	Static	Treated
Baseline	*93%*	134,465	Baseline	*97%*	130,431	Baseline	90%	130,431	130,431	0
			Progressive	*2%*	2,689					
			RMS	*1%*	1,345					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
								Acres		
System	Percent	Acres	System	Percent	Acres	System	Percent	Total	Static	Treated
Progressive	*6%*	8,675	Progressive	*99%*	8,588	Progressive	8%	11,278	8,588	2,689
			RMS	*1%*	87					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
								Acres		
System	Percent	Acres	System	Percent	Acres	System	Percent	Total	Static	Treated
RMS	*1%*	1,446	RMS	100%	1,446	RMS	2%	2,877	1,446	1,431
Grand Totals	**100%**	**144,586**					**100%**	**144,586**	**140,465**	**4,121**

WATERSHED NAME & CODE	ROYAL SLOPE - ROYSLO_1	LANDUSE ACRES	144,586
LANDUSE TYPE	IRRIGATED	TYPICAL UNIT SIZE ACRES	370
ASSESSMENT INFORMATION		CALCULATED PARTICIPATION	3%

	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Irrigation induced	Water Quality – Excessive Nutrients and Organics in Groundwater	Fish and Wildlife – Habitat Fragmentation	Profitability - Change in Profitability
Baseline				**System Rating ->**	**-1**	**0**	**0**	**0**
Irrigation System, Sprinkler (ac.) 442	90,092	87,389	0	87,389	0	0	0	-1
Irrigation System, Surface and Subsurface (ac.) 443	8,068	7,826	0	7,826	-2	0	0	-1
Total Acreage at Baseline	**134,465**	**130,431**	**0**	**130,431**				
Progressive				**System Rating ->**	**4**	**4**	**3**	**0**
Anionic Polyacrylamide (PAM) Erosion Control (ac.) 450	2,169	2,147	672	2,819	3	-1	0	2
Conservation Cover (ac.) 327	1,041	1,031	323	1,353	5	1	5	-4
Cover Crop (ac.) 340	87	86	27	113	0	1	1	-1
Irrigation Water Management (ac.) 449	1,995	1,975	619	2,594	4	5	0	2
Nutrient Management (ac.) 590	7,894	7,815	2,447	10,263	0	5	1	1
Pest Management (ac.) 595	7,894	7,815	2,447	10,263	1	0	0	1
Residue Management, Seasonal (ac.) 344	87	86	27	113	4	-1	1	-1
Total Acreage at Progressive Level	**8,675**	**8,588**	**2,689**	**11,278**				
RMS				**System Rating ->**	**3**	**0**	**3**	**0**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	723	723	716	1,439	5	-1	1	-1
Upland Wildlife Habitat Management (ac.) 645	795	795	787	1,582	0	0	5	-1
Total Acreage at RMS Level	**1,446**	**1,446**	**1,431**	**2,877**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**217,287**	N/A
Agricultural Landcover	**141,483**	**65%**
Irrigated	92,039	65%
Dryland	14,155	10%
Range	35,289	25%

Analysis Unit: Royal Slope

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		829	1%	853	1%	470	0%	2,151	2%
Fish and Wildlife Habitat Conservation Areas[1,2]		1,525	1%	437	0%	5,104	4%	7,065	5%
Critical Aquifer Recharge Areas		591	0%	116	0%	235	0%	942	1%
Geologic Hazards	Water Erosion	7,190	5%	2,044	1%	15,992	11%	25,226	18%
	Wind Erosion	84,382	60%	12,093	9%	18,827	13%	115,303	81%
Frequently Flooded Areas		1,198	1%	659	0%	632	0%	2,489	2%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**70**	**14%**	**77**	**15%**	**89**	**18%**	**236**	**47%**
Shorelines of the State	2		2		3		8	
Fish Use or Potential Fish Use	0		2		1		3	
No Fish Use	0		0		0		1	
Unknown	68		72		84		224	

Notes:
1. Streams data excludes irrigation canals

Royal Slope

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**829**	**853**	**470**	**2,151**
Freshwater Emergent Wetland	703	658	356	1,717
Freshwater Forested/Shrub Wetland	46	55	17	118
Lake/Pond	72	120	72	263
Riverine	7	18	20	46
Other	1	2	4	7

Royal Slope

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**1,525**	**437**	**5,104**	**7,065**
Birds	**1,460**	**350**	**719**	**2,529**
American White Pelican	0	0	0	0
Bald Eagle	0	0	0	0
Burrowing Owl	0	0	0	0
Clark's Grebe	0	0	0	0
Common Loon	0	0	1	1
Eared Grebe	0	0	0	0
Ferruginous Hawk	0	0	0	0
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	0	0
Loggerhead Shrike	0	0	0	0
Sage Grouse	0	0	0	0
Sandhill Crane	1,448	114	445	2,007
Sharp-tailed Grouse	0	0	0	0
Shorebird Concentrations	0	0	0	0
Tundra Swan	0	0	0	0
Western Grebe	0	0	0	0
Waterfowl Concentrations	33	236	274	543
Amphibians/Reptiles	**0**	**1**	**419**	**420**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	1	419	420
Cliffs/bluffs	**0**	**1**	**947**	**948**
Shrub-Steppe	**65**	**87**	**3,792**	**3,943**
Other Species and Habitats	**0**	**0**	**0**	**0**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	0	0
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Royal Slope

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**652**	**171**	**8,009**	**8,833**
Birds	**645**	**170**	**7,834**	**8,649**
Barrow's Goldeneye	0	0	0	0
Chukar	585	105	7,774	8,463
Ring-necked Pheasant	60	65	61	186
Mammals	**7**	**2**	**175**	**184**
Mule Deer	7	2	175	184
Rocky Mountain Elk	0	0	0	0
White-tailed Jackrabbit	0	0	0	0

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Royal Slope

Appendix B-2: Community Planning Areas: Warden

Warden Community Description

The Warden Community Planning Area is located in southeastern Grant County, southeast of the Potholes Reservoir. Much of the western part of the Warden Community is covered by the Columbia National Wildlife Refuge and the eastern portion is rich with farms, history, and crop diversity. Crops grown in the Warden Community area include potatoes, grapes, feed corn, wheat, peas, alfalfa, seed crops, and beans.

Profile

Water Resources

Water resources in this community are largely a result of water brought to the area as a part of the Columbia Basin Project (CBP). The Potholes Reservoir boarders the northwestern portion of the community. The Drumheller Channels, a series of small lakes and CBP channels, are located in the Columbia National Wildlife Refuge in the western portion of the Community. Lind Coulee runs through the eastern portion of the Community before moving into the Moses Lake Community and draining into Potholes Reservoir.

Soils and Terrain

The eastern agricultural portion of the region is dominated by sandy and silty loam soils. These soils are deep and well-drained, and in some cases, excessively drained (Gentry 1984). The Drumheller Channels region comprises channel scablands within bedrock that are formed through the collection of seepage and runoff. Some soils the community are also moderately to highly susceptible to water and wind erosion.

Agricultural Landcover and Primary Crops/Products

Approximately 66% of Warden Community is within agricultural landcover (private lands), primarily comprising irrigated and dryland crops. In 2015, primary crops produced in the community included row crops, such as potatoes, corn, wheat, alfalfa hay, and peas, and permanent crops, such as apples (WSDA 2015).

Landcover	Acres	Percent
Total Community Area	**70,728**	**NA**
Agricultural Landcover	**46,674**	**66%**
Irrigated	25,824	55%
Dryland	11,448	25%
Range	9,402	20%

In 1954, the Columbia Basin Irrigation Project East Low Canal would bring irrigation water from Grand Coulee Dam to the Warden Community. The Lind Coulee pilot project was a major effort to study return flows from rill-irrigated row-crop fields in the Warden Community area. Studies showed significant irrigation-induced soil erosion entering Lind Coulee, which discharges into the Potholes Reservoir. The development and implementation of best management practices have made significant improvements to water quality in Lind Coulee.

Location of Critical Areas

Critical Aquifer Recharge Areas (CARAs) have a relatively large mapped intersection with agricultural lands in the Warden Community. In total, there are 13 wells in the Warden Community, which includes the public water supply wellhead protection area for the Town of Warden that extends into the surrounding agricultural lands. These wells are associated with the Wamapum Basalt aquifer (shallow wells) and Grant Ronde aquifer (deep wells; EA 2017).

Fish and Wildlife Habitat Conservation Areas (HCAs), mapped as Priority Habitat and Species (PHS) within the Warden Community, intersect predominantly within publicly owned wildlife management areas, including the Columbia National Wildlife Refuge. Only a small amount of PHS occurs in agricultural lands, including 1,156 acres of shrub-steppe habitat.

Other Critical Areas such as wetlands, water erosion potential, and frequently flooded areas have small intersections with agriculture in the Warden Community. Most water erosion potential and wetlands in the community occur mostly along Lind Coulee and in areas near the Columbia National Wildlife Refuge.

Critical Areas	Areas within Agricultural Lands[1, 2]							
	Irrigated		Dryland		Rangeland		Total	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands	66	<1%	113	<1%	245	1%	425	1%
HCAs – Non-game Species	0	0%	49	<1%	1,118	2%	1,167	3%
HCAs – Game Species	137	<1%	156	1%	1,246	13%	1,540	3%
CARAs	3,152	7%	916	2%	1,034	2%	5,102	11%
Geologic Hazards[3]	1,038	2%	787	2%	4,262	9%	6,087	13%
Frequently Flooded Areas	278	1%	439	1%	206	<1%	923	2%

1. Agricultural areas included in this summary are limited to privately owned lands.
2. Percentages are provided per agricultural type and total agricultural lands.
3. Only displaying water erosion potential as a geologically hazardous area. In addition to water erosion potential, wind erosion potential covers approximately 40% of the agricultural area in this community.

Critical Area Functions

Critical area functions within the Warden Community, including water quality, habitat, soil, and hydrology are discussed below. This discussion focuses on existing functions (2011) and potential stressors on functions from agricultural activities on private lands. Many of the critical areas and associated functions in the Warden Community are protected by the Columbia National Wildlife Refuge. Although these areas are not managed under VSP, agricultural activities on privately owned lands may have indirect effects on critical area functions in these areas.

Water Quality Function
• Much of the water quality functions in the community are managed by the Columbia National Wildlife Refuge. Publicly owned lands in the Warden Community contain wetlands and lakes, which help filter surface and groundwater inputs. In this Community, a tributary to Lind Coulee is listed on the Washington State Department of Ecology 303(d) List as Category 5 for pH, and one of the lakes in the Columbia National Wildlife Refuge is listed for dieldrin (Ecology 2016). • Riparian vegetation in the Columbia National Wildlife Refuge includes a mix of native and introduced trees and shrubs (WDFW 2006). These areas provide stream cover, which reduces temperatures and helps filter surface and groundwater inputs. • High infiltration rate soils are highly vulnerable to nitrate contamination to groundwater where shallow wells are located.
Habitat Function
• **Upland and riparian habitat:** Most of the upland and riparian habitat in agricultural areas occurs in the margins between fields. These areas and the cultivated fields provide shelter and migration corridors for terrestrial species; and forage and breeding opportunities, particularly for avian and terrestrial species. The shrub-steppe uplands are located mainly in rangelands. The Columbia National Wildlife Refuge provides diverse areas of wetlands and desert upland. Riparian zones in agricultural portions of the Community occur mainly along channels and consist of narrow strips of low-growing grasses and shrubs. Agriculture is dominant and flanks the riparian zone directly in most areas. • **Aquatic habitat:** Streams are not a prominent feature in this Community, instead a series of lakes and channels are found in the western portion of the Community in the Columbia National Wildlife Refuge. Lind Coulee is the main waterbody in the community, and the stream is generally confined to its channel by land use. Fish presence is primarily limited to rainbow trout (Anchor QEA 2013). • **Wildlife and habitat**: The western portion of the community is in the Columbia National Wildlife Refuge and is home to many species, including, mule deer, waterfowl, and upland birds. Ring-necked pheasants can be found in the eastern half of the region, especially within areas of dense natural vegetation. Additionally, patches of shrub-steppe habitat can be found throughout the Warden Community.
Soil and Hydrology Functions
• Surface water moves significant amounts of flow through this area for irrigation supply, along with soil and other water quality parameters, and creates wetland and stream-like habitat as water moves through topographic lows • Soils are characterized as silty and sand with susceptibility to water and wind erosion. • Potential for reduced groundwater quantity with irrigation water withdrawals within deep aquifers where connection with surface recharge is limited and occurs at low rates.

Indirect Effects of Agriculture on Critical Area Functions

Indirect effects occur within areas that are not adjacent to or within critical areas. Within the Warden Community, agricultural activities can have indirect effects on surface and groundwater quality function and quantity (hydrology function) where the community is located near public supply wells. Many of the community's privately owned wells are highly vulnerable to nitrate contamination (NRCS 2016). Additionally, transport of sediments from higher elevation fields located away from critical areas can carry these sediments to waterways from water-induced erosion.

Although wind erosion susceptibility areas are not designated critical areas, wind erosion can affect soil health and agricultural viability, so it has been identified as a management concern for this area as moderate to high wind erosion susceptibility areas are mapped within approximately 40% of the community's agricultural lands.

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017-2027 Implementation Target[1]
• Manage irrigation water so it is delivered, scheduled and/or applied efficiently • Manage nutrients and pesticides effectively and efficiently • Manage deep aquifer water withdrawals for sustained availability of groundwater • Protect soils from water and wind erosion • Protect or enhance upland wildlife habitat • Plan intensity, frequency, timing, and duration of grazing to manage groundcover and plant density to maintain infiltration capacity and reduce runoff	• Water management • Cover crop • Conservation cover • Nutrient management • Pest management • Residue management • Direct seed • Upland wildlife habitat management	1,118 acres[2]

1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Warden Community (see attached RWA).
2. Range management acres such as prescribed grazing are excluded from this implementation target. See Appendix B-9 for County-wide description on range management and implementation targets.

References

Anchor QEA (Anchor QEA, LLC), 2013. Grant County Shoreline Master Program Update: Inventory, Analysis, and Characterization Report.

EA (EA Engineering, Science, and Technology, Inc. PBC), 2017. Grant County CARA and VSP. January 2017.

NRCS (Natural Resources Conservation Service), 2016. Grant County, Washington Map: Nitrate Vulnerability Map (With Wells) for Wells 145 Feet Deep. Provided by Harold Crose, Grant County Conservation District. June 24, 2016.

USBR (United States Bureau of Reclamation), 2002. Potholes Reservoir Resource Management Plan. August 2002. Available from: https://www.usbr.gov/pn/programs/rmp/potholes/rmp-potholes2002.pdf

WDFW (Washington Department of Fish and Wildlife), 2006. Columbia Basin Wildlife Area Management Plan. November 2006. Available from: http://wdfw.wa.gov/publications/00461/.

WSDA (Washington State Department of Agriculture), 2015. WSDA Crop Data.

Attachments

- Grant County Critical Areas Map (See Appendix A: VSP Map Folio)
- Warden Community Rapid Watershed Assessment Tables
- Warden Community GIS Summary Table

Enter Watershed Variables Below

Watershed Name	*Warden*	Watershed Code	*Ward-1*		
Landuse Type	*Irrigated*	Landuse Acres	*41,873*	Interest Rate	*4%*
Typical Unit Size (ac)	*233*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*

Estimated Time Frame = 5 years

Participation Rate (Based on Watershed Profile): *5%*

3% Calculated Participation Rate (Based on Projected Future Conditions)

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Baseline	*84%*	35,173	Baseline	*97%*	34,118	Baseline	81%	34,118	34,118	0
			Progressive	*2%*	703					
			RMS	*1%*	352					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Progressive	*15%*	6,281	Progressive	*99%*	6,218	Progressive	17%	6,922	6,218	703
			RMS	*1%*	63					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
RMS	*1%*	419	RMS	100%	419	RMS	2%	833	419	415
Grand Totals	**100%**	**41,873**					**100%**	**41,873**	**40,755**	**1,118**

WATERSHED NAME & CODE	WARDEN - WARD-1	LANDUSE ACRES	41,873
LANDUSE TYPE	IRRIGATED	TYPICAL UNIT SIZE ACRES	233
ASSESSMENT INFORMATION		CALCULATED PARTICIPATION	3%

	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Irrigation induced	Water Quantity – Inefficient Water Use on Irrigated Land	Water Quantity – Aquifer Overdraft	Profitability - Change in Profitability
Baseline				**System Rating ->**	**1**	**0**	**2**	**0**
Irrigation System, Sprinkler (ac.) 442	22,863	22,177	0	22,177	1	1	3	1
Irrigation System, Surface and Subsurface (ac.) 443	2,462	2,388	0	2,388	2	1	3	1
Total Acreage at Baseline	**35,173**	**34,118**	**0**	**34,118**				
Progressive				**System Rating ->**	**1**	**2**	**2**	**2**
Conservation Cover (ac.) 327	3,078	3,047	345	3,392	2	1	4	1
Cover Crop (ac.) 340	63	62	7	69	0	1	3	1
Irrigation Water Management (ac.) 449	2,701	2,674	302	2,976	1	2	3	1
Nutrient Management (ac.) 590	6,281	6,218	703	6,922	-3	-3	-4	-1
Pest Management (ac.) 595	6,093	6,032	682	6,714	2	2	2	1
Residue Management, Seasonal (ac.) 344	63	62	7	69	3	4	0	4
Total Acreage at Progressive Level	**6,281**	**6,218**	**703**	**6,922**				
RMS				**System Rating ->**	**1**	**2**	**1**	**1**
Residue Management, No-Till/Strip Till/Direct Seed (ac.) 329	63	63	62	125	2	4	0	2
Upland Wildlife Habitat Management (ac.) 645	226	226	224	450	1	0	3	1
Total Acreage at RMS Level	**419**	**419**	**415**	**833**				

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**70,728**	N/A
Agricultural Landcover	**46,674**	**66%**
Irrigated	25,824	55%
Dryland	11,448	25%
Range	9,402	20%

Analysis Unit: Warden

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		66	0%	113	0%	245	1%	425	1%
Fish and Wildlife Habitat Conservation Areas[1,2]		0	0%	49	0%	1,118	2%	1,167	3%
Critical Aquifer Recharge Areas		3,152	7%	916	2%	1,034	2%	5,102	11%
Geologic Hazards	Water Erosion	1,038	2%	787	2%	4,262	9%	6,087	13%
	Wind Erosion	12,175	26%	2,607	6%	3,932	8%	18,714	40%
Frequently Flooded Areas		278	1%	439	1%	206	0%	923	2%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**21**	**15%**	**31**	**23%**	**16**	**12%**	**69**	**49%**
Shorelines of the State	0		0		0		1	
Fish Use or Potential Fish Use	0		0		1		1	
No Fish Use	0		0		0		0	
Unknown	21		31		15		67	

Notes:
1. Streams data excludes irrigation canals

Warden

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**66**	**113**	**245**	**425**
Freshwater Emergent Wetland	43	90	99	232
Freshwater Forested/Shrub Wetland	2	2	7	11
Lake/Pond	20	17	75	112
Riverine	0	4	64	69
Other	0	0	1	1

Warden

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**0**	**49**	**1,118**	**1,167**
Birds	**0**	**1**	**10**	**11**
American White Pelican	0	0	0	0
Bald Eagle	0	0	0	0
Burrowing Owl	0	0	0	0
Clark's Grebe	0	0	0	0
Common Loon	0	0	0	0
Eared Grebe	0	0	0	0
Ferruginous Hawk	0	0	0	0
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	0	0
Loggerhead Shrike	0	0	0	0
Sage Grouse	0	0	0	0
Sandhill Crane	0	0	0	0
Sharp-tailed Grouse	0	0	0	0
Shorebird Concentrations	0	0	0	0
Tundra Swan	0	0	0	0
Western Grebe	0	0	0	0
Waterfowl Concentrations	0	1	10	11
Amphibians/Reptiles	**0**	**0**	**0**	**0**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	0	0	0
Cliffs/bluffs	**0**	**0**	**0**	**0**
Shrub-Steppe	**0**	**48**	**1,108**	**1,156**
Other Species and Habitats	**0**	**0**	**0**	**0**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	0	0
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Warden

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**137**	**156**	**1,246**	**1,540**
Birds	**39**	**91**	**1,134**	**1,264**
Barrow's Goldeneye	0	0	0	0
Chukar	0	0	0	0
Ring-necked Pheasant	39	91	1,134	1,264
Mammals	**98**	**65**	**112**	**276**
Mule Deer	98	65	112	276
Rocky Mountain Elk	0	0	0	0
White-tailed Jackrabbit	0	0	0	0

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Warden

Appendix B-2: Community Planning Areas: Rangelands

Rangelands Description

Historic Conditions (Pre-European settlement)

Pre-European settlement, the rangeland of Grant County was primarily a sagebrush-bunchgrass ecosystem. Plant communities varied based on soil type, position on landscape, annual precipitation, and time interval since the last wildfire. This era was characterized by six different plant communities and six different soil-landscape situations described in Table 1. The native rangeland plant communities provided habitat for a variety of native wildlife species, including mule deer, jackrabbit, sage grouse, cougars, sagebrush thrashers, and geese.

Table 1
Historic Plant Communities within Grant County Rangelands

Soils/Landscape	Plant Communities
Deep silt loam soils and rocky silt loam soils	Bluebunch wheatgrass-Wyoming sagebrush community
Scabrock patches	Stiff sagebrush-Sandberg bluegrass community
Deep loamy basins	Basin wildrye-basin big sagebrush community
Alkali spots	Greasewood-saltgrass community
Areas of sand	Needleandthread-Indian ricegrass-sagebrush community
Steep north-facing slopes	Bluebunch wheatgrass-Wyoming sagebrush community

Current Conditions (Post-European settlement)

European settlement brought in cattle and sheep, and invasive plant species such as cheatgrass, Russian thistle, and knapweed. With heavy grazing pressure and other disturbances, the native bunchgrasses declined while the invasive plant species colonized and now dominate many areas. Thousands of acres of rangeland were converted to cropland (both non-irrigated and irrigated). In places, the rangeland of Grant County has been greatly fragmented.

The 1984 *Washington State Grazing Land Assessment* shows Grant County having 745,000 acres of rangeland. It also showed that about 60% of the rangeland was in poor condition and only about 20% remained in good to excellent condition. According to the 2011 Washington State Department of Agriculture (WSDA) and U.S. Department of Agriculture (USDA) agricultural landcover data shown in Table 2, rangeland cover accounted for 400,000 acres or 34% of the County's agricultural landcover on private lands (USDA 2011; WSDA 2011). See Figure 4: Agricultural Landcover in Appendix A: VSP Map Folio.

Table 2
2011 Agricultural Landcover in Grant County

Landcover	Acres	Percent
Total County Area	**1,758,594**	**N/A**
Agricultural Landcover	**1,195,519**	**68%**
Irrigated	477,783	40%
Dryland	317,005	27%
Range	400,731	34%

Objectives and Key Practices

Protection/Enhancement Objectives	Key Stewardship Practices	2017 to 2027 Implementation Target[1]
• Manage invasive species • Protect soils from water and wind erosion • Plan intensity, frequency, timing, and duration of grazing to manage groundcover and plant density to maintain infiltration capacity and reduce runoff	• Range planting • Prescribed grazing • Upland wildlife management	21,531 acres

Note:
1. Acres are based on projected new conservation treatments identified by the Rapid Watershed Assessment (RWA) for the Rangelands (see attached RWA).

References

USDA (U.S. Department of Agriculture), 2011. Agricultural Landcover GIS Data.

WSDA (Washington State Department of Agriculture), 2011. Agricultural Landcover GIS Data.

Attachments

- Grant County Agricultural Landcover Map (See Appendix A: VSP Map Folio)
- Rangelands Rapid Watershed Assessment Tables

Enter Watershed Variables Below

Watershed Name	*Grant_Range*	Watershed Code	*Range*		
Landuse Type	*Rangelands*	Landuse Acres	*745,000*	Interest Rate	*4%*
Typical Unit Size (ac)	*1,000*	Percent TA of FA	*30%*	Cost-Share Rate	*50%*

Estimated Time Frame = 5 years

Participation Rate (Based on Watershed Profile): *5%*

3% Calculated Participation Rate (Based on Projected Future Conditions)

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Baseline	*95%*	707,750	Baseline	*97%*	686,518	Baseline	92%	686,518	686,518	0
			Progressive	*2%*	14,155					
			RMS	*1%*	7,078					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
Progressive	*4%*	29,800	Progressive	*99%*	29,502	Progressive	6%	43,657	29,502	14,155
			RMS	*1%*	298					
			Must Total 100%	*100%*						

Current Conditions			Projected Change			Projected Future Condition				
System	Percent	Acres	System	Percent	Acres	System	Percent	Acres		
								Total	Static	Treated
RMS	*1%*	7,450	RMS	100%	7,450	RMS	2%	14,826	7,450	7,376
Grand Totals	**100%**	**745,000**					**100%**	**745,000**	**723,470**	**21,531**

WATERSHED NAME & CODE	GRANT_RANGE - RANGE				LANDUSE ACRES	745,000		
LANDUSE TYPE	RANGELANDS				TYPICAL UNIT SIZE ACRES	1,000		
ASSESSMENT INFORMATION					CALCULATED PARTICIPATION	3%		
	Benchmark Conditions	Future Conditions			RESOURCE CONCERNS			
Conservation Systems by Treatment Level	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Ephemeral Gully	Plant Condition – Noxious and Invasive Plants	Fish and Wildlife – T & E Fish/Wildlife Species: Listed or Proposed under ESA	Profitability - Change in Profitability
Baseline				**System Rating ->**	**0**	**0**	**0**	**1**
Fence (ft.) 382	708	687	0	687	0	0	1	2
Total Acreage at Baseline	**707,750**	**686,518**	**0**	**686,518**				
Progressive				**System Rating ->**	**3**	**3**	**2**	**1**
Range Planting (ac.) 550	298	295	142	437	4	4	3	2
Prescribed Grazing (ac.) 528	23,244	23,012	11,041	34,052	3	4	2	2
Total Acreage at Progressive Level	**29,800**	**29,502**	**14,155**	**43,657**				
RMS				**System Rating ->**	**2**	**3**	**1**	**1**
Range Planting (ac.) 550	75	77	71	148	4	4	3	2
Upland Wildlife Habitat Management (ac.) 645	75	75	74	148	0	4	0	-1
Total Acreage at RMS Level	**7,450**	**7,450**	**7,376**	**14,826**				

Appendix B-3
Grant County Critical Areas Ordinance Designations and Definitions

Appendix B-3: Grant County Critical Areas Designations and Definitions

Grant County Critical Areas and Cultural Resources Code (Chapter 24.08)

General Provisions

Critical areas in Grant County are categorized as follows:

1. Wetlands
2. Frequently Flooded Areas
3. Critical Aquifer Recharge Areas
4. Geologically Hazardous Areas
5. Fish and Wildlife Habitat Conservation Areas
6. Cultural Resource Areas:
   While Cultural Resource Areas are identified as a critical area within Grant County Code (GCC) Chapter 24.08, activities requiring cultural resource areas review will continue to be reviewed and regulated through the County's Critical Areas Ordinance, as opposed to the Voluntary Stewardship Program.

Resource Information and Maps (GCC 24.08.080):

- Critical areas are designated on a series of data maps maintained by the Department.
- The maps are for information and illustrative purposes, and are intended to alert a person to the potential presence of critical areas:
  - Intended to indicate if further study or review is needed to determine the presence of critical areas
  - Actual presence of critical areas will be based on field investigation and best available science

Wetlands

Identification and Designation (GCC 24.08.200)

Wetlands shall be identified and designated based on the definitions, methods and standards set forth in the Washington State Wetland Identification and Delineation Manual, Department of Ecology publication #96-94.

Maps and References (GCC 24.08.210)

The following maps and references should be used to assist in making a Preliminary Determination:

- Wetlands mapped under the National Wetland Inventory by the U.S. Department of Interior Fish and Wildlife Service
- Washington State Department of Fish and Wildlife Priority Habitat and Species (PHS) maps
- Federal Wetlands Delineation Manual, 1987
- Washington State Wetlands Identification and Delineation Manual, Washington State Department of Ecology, March 1997
- Washington State Wetlands Rating System for Eastern Washington, Publication No. 91-58, Washington State Department of Ecology:
  - *GCC 24.02.220(a)(1) identifies the Ecology Wetlands Rating System as may be amended in the future, for wetland rating classes. The most recently amended Ecology Rating System for Eastern Washington is dated October 2014 (Ecology Publication No. 14-06-030)*
- Wetlands previously identified through the methodology specified under GCC 24.08.200 for another development permit or approval application

Fish and Wildlife Habitat Conservation Areas (HCAs)

Identification and Designation (GCC 24.08.300)

HCAs in the County shall include:

- Areas within which State and Federal endangered and threatened species exist, or State sensitive, candidate and monitor species have a primary association
- Priority Habitat and Species Areas identified by the Washington State Department of Fish and Wildlife
- Habitats and species of local importance that have been designated by the County at the time of application
- Naturally occurring ponds under twenty (20) acres and their submerged aquatic beds that provide fish or wildlife habitat. These do not include ponds deliberately designed and created from dry sites such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds of less than three (3) years' duration and landscape amenities. Naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority
- Waters of the state as defined by WAC 222-16
- Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity
- Areas with which anadromous fish species have a primary association

In addition to the HCAs identified above, additional species and habitats of local importance may be designated by the Administrative Official, per criteria defined in GCC 24.08.300(c). These might include:

- Areas of high relative density or species richness, breeding and rearing habitat, winter range and movement and/or migration corridors
- Habitats that are of limited availability or high vulnerability to alteration such as cliffs, caves, talus, shrub steppe, in-stream gravel deposits (salmon spawning beds), and wetlands riparian areas

The following important habitat areas which are not based on use by a specific species include those areas protected by their conservation ownership or management status and are not subject to the protection standards within this Chapter:

- National Wildlife Refuges, National Parks, Natural Area Preserves, or any preserve or reserve designated under WAC 332-30-151;
- State Natural Area Preserves or Natural Resource Conservation Areas identified by state law and managed by the Department of Natural Resources; and
- Areas with recognized wildlife habitat value owned by the Bureau of Land Management or the Nature Conservancy.

Maps and References (GCC 24.08.310)

Site reconnaissance should include use of the following to assist in making a Preliminary Determination:

- Washington State Department of Fish and Wildlife Priority Habitat and Species (PHS) maps
- Wetlands mapped under the National Wetland Inventory by the U.S. Department of Interior; Fish and Wildlife Service
- Washington State Department of Fish and Wildlife/Department of Natural Resources, Washington Rivers Inventory System (WARIS) maps
- U.S. Department of the Interior, Spokane District Resource Management Plan

Critical Aquifer Recharge Areas (CARAs)

Identification and Designation (GCC 24.08.400)

CARAs are areas having a critical recharging effect on aquifer use for potable water defined as:

- Those areas designated as Wellhead Protection Areas (pursuant to WAC 246-290-135(4) and WAC 246-291-100 (2)(e)). Wellhead protection areas shall, for the purpose of this regulation, include the identified recharge areas associated with either Group A public water supply wells

and those Group B wells with a wellhead protection plan filed with the Grant County Health District.

- Any land identified in the Soil Survey of Grant County as having high potential for aquifer recharge, as determined by the Administrative Official.

Maps and References (GCC 24.08.410)

Site reconnaissance should include use of the following to assist in making a Preliminary Determination:

- Wellhead Protection Plans on file with the Grant County Health District
- Soil Survey of Grant County, Washington by the United States Department of Agriculture, Soil Conservation Service

Geologically Hazardous Areas (GHAs)

Identification and Designation (GCC 24.08.500)

GHAs shall include erosion, landslide, mine, and seismic hazards and are defined as follows:

- Erosion Hazards:
  - Those areas identified as having high or very high water erosion hazard by the U.S. Department of Agriculture Natural Resources Conservation Service as designated by the Natural Resources Conservation Service local office.
- Landslide Hazards:
  - Those areas potentially subject to landslides based upon the combination of geologic, topographic and hydrologic factors as described in GCC 24.08.500(c).
- Mine Hazards:
  - Those areas that fall within or 100 horizontal feet of a mine opening at the surface or an area designated as a mine hazard area by the Washington State Department of Natural Resources.
- Seismic Hazards:
  - Those areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, soil liquefaction or surface faulting, including areas with erosion or landslide hazards or areas located on a Holocene fault line.

As noted in the Voluntary Stewardship Program (VSP) Work Plan (Volume I), structures in agricultural lands will continue to be permitted and regulated through the County's Critical Areas Ordinance, notably for landslide, mine, and seismic hazard areas. Geologically hazardous areas for erosion hazards have primary applicability in the VSP context.

Maps and References (GCC 24.08.520)

Site reconnaissance should include use of the following to assist in making a Preliminary Determination:

- United States Department of Agriculture, Soil Conservation Service Grant County Soil Survey Maps and Tables
- All of Grant County lies within a Seismic Risk Zone 2(b), as shown on the Uniform Building Code Seismic Risk Zone Map of the United States
- United States Geological Survey topographic and geologic maps

Frequently Flooded Areas (FFAs)

Identification and Designation (GCC 24.08.600)

Frequently flooded areas shall be the most restrictive designation of floodways and associated floodplains out of the following:

- Delineated by Federal Emergency Management Agency (FEMA) as being within the 100-year flood plain or those floodways and associated floodplains
- Delineated by a comprehensive flood hazard management plan adopted by Grant County Board of Commissioners, as being within the 100-year floodplain or having experienced historic flooding

Maps and References (GCC 24.08.610)

Site reconnaissance should include use of the most current F.E.M.A. Flood Insurance Rate Maps to assist in making a Preliminary Determination.

Appendix B-4
Baseline Conditions Critical Areas Data Summary

Appendix B-4
Baseline Conditions Critical Areas Data Summary

Critical Areas Data Summary Tables

Table 1

Agricultural Activity Landcover

Landcover	Acres	Percent
Total Area	**1,758,594**	N/A
Agricultural Landcover	**1,195,519**	**68%**
Irrigated	477,783	40%
Dryland	317,005	27%
Range	400,731	34%

Analysis Unit: County-wide Summary

Global Notes: - Agricultural areas included in VSP are limited to privately-owned lands. Additionally, incorporated city/town limits are not included in VSP and are excluded from these calculations.
- See Appendix A-2 for GIS Data Sources and Methods.
- Critical area percentages are based on the total private agricultural landcover

Table 2

Critical Areas within Agricultural Lands

Critical Areas		Areas within Agricultural Lands							
		Irrigated		Dryland		Rangeland		Total	
		Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Wetlands		1,488	0%	2,243	0%	3,311	0%	7,043	1%
Fish and Wildlife Habitat Conservation Areas[1,2]		5,147	0%	43,754	4%	74,353	6%	123,254	10%
Critical Aquifer Recharge Areas		12,511	1%	3,302	0%	7,391	1%	23,204	2%
Geologic Hazards	Water Erosion	17,256	1%	103,184	9%	137,961	12%	258,401	22%
	Wind Erosion	307,914	26%	67,419	6%	83,761	7%	459,093	38%
Frequently Flooded Areas		5,939	0%	7,297	1%	8,562	1%	21,798	2%

Notes:
1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

Table 3

Stream Summary[1]

Critical Areas	Areas within Agricultural Lands							
	Irrigated		Dryland		Rangeland		Total	
	Miles	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*	*Miles*	*Percent*
Streams Total	**341**	**10%**	**920**	**26%**	**908**	**26%**	**2,170**	**62%**
Shorelines of the State	4		11		34		48	
Fish Use or Potential Fish Use	1		3		4		9	
No Fish Use	0		1		2		3	
Unknown	336		905		868		2,109	

Notes:
1. Streams data excludes irrigation canals

County-wide Summary

Wetlands Data Summary

Table 4

Wetland Summary

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Wetlands (all types)	**1,488**	**2,243**	**3,311**	**7,043**
Freshwater Emergent Wetland	1,205	1,759	1,779	4,742
Freshwater Forested/Shrub Wetland	55	72	73	201
Lake/Pond	214	343	813	1,370
Riverine	10	51	580	641
Other	3	19	67	88

County-wide Summary

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 5

Priority Habitats and Species(PHS) Summary - excluding game species[1,2]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
Priority Habitats and Species	**5,147**	**43,754**	**74,353**	**123,254**
Birds	**2,939**	**40,505**	**38,654**	**82,097**
American White Pelican	1	44	68	113
Bald Eagle	31	18	247	296
Burrowing Owl	11	2	21	35
Clark's Grebe	1	32	46	78
Common Loon	0	3	21	24
Eared Grebe	0	0	4	4
Ferruginous Hawk	128	11	10	149
Forster's Tern	0	0	0	0
Great Blue Heron	0	0	0	0
Grebe Species	0	0	8	8
Loggerhead Shrike	0	30	165	196
Sage Grouse	31	38,827	35,275	74,132
Sandhill Crane	1,449	114	446	2,009
Sharp-tailed Grouse	0	0	1	1
Shorebird Concentrations	59	272	482	813
Tundra Swan	0	12	23	35
Western Grebe	0	0	0	0
Waterfowl Concentrations	1,283	1,477	2,507	5,268
Amphibians/Reptiles	**0**	**1**	**419**	**420**
Northern Leopard Frog	0	0	0	0
Striped Whipsnake	0	1	419	420
Cliffs/bluffs	**0**	**33**	**6,404**	**6,438**
Shrub-Steppe	**2,289**	**3,370**	**31,218**	**36,877**
Other Species and Habitats	**0**	**0**	**182**	**182**
Snag-rich Areas	0	0	0	0
Talus Slopes	0	0	182	182
Instream Habitat	0	0	0	0
Yuma Skipper	0	0	0	0

Notes:

1. Excluding game species (see Table 6 for full list of game species)
2. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

County-wide Summary

Fish and Wildlife Habitat Conservation Areas - PHS Data Summary

Table 6

PHS Summary (game species)[1]

Critical Areas	Acres within Agricultural Lands			
	Irrigated	Dryland	Rangeland	Total
PHS (Game Species)	**26,767**	**54,445**	**103,663**	**184,875**
Birds	**3,794**	**4,282**	**29,196**	**37,271**
Barrow's Goldeneye	0	0	4	4
Chukar	1,099	2,064	24,623	27,785
Ring-necked Pheasant	2,695	2,218	4,569	9,482
Mammals	**25,786**	**53,490**	**86,717**	**165,993**
Mule Deer	25,786	53,489	86,714	165,988
Rocky Mountain Elk	0	2	40	42
White-tailed Jackrabbit	0	0	271	271

Notes:

1. Summary Priority and Habitat Species numbers are collapsed so that overlapping species or habitats are not double counted

County-wide Summary

Appendix B-5
Agricultural Viability Interview Summary

Appendix B-5: Agricultural Viability Interviews Summary

Grant County is unique in location, growing climate, and agricultural diversity enabled through irrigation supply from the Columbia Basin Project (CBP). These are all important factors in considering agricultural viability. To obtain a firsthand agricultural viability perspective, several producers in the County were interviewed. A compiled summary of the interviews is provided below (Dormaier 2016; Kraurscheid 2016; Leitz 2016).

1.1.1.1 What do you see in terms of trends for agricultural viability in Grant County or the region?

- Majority of seed and hay crops are extorted overseas (Europe, South America, Mexico, China, Taiwan, Korea, or Japan).
  - This results in reliance on the longshoreman's union and exchange rates
- Some crops are exported to the eastern US because the local market is not large enough.
- There is a constant evolution in practices, for example the shift to no till. Additionally, precision farming is an up-in-coming practices which includes things like cell phone activated pump systems, drone technology, real time infrared photos, etc. There is an opportunity to further the use of drones though a co-op.
- There is a trend toward more mechanization for pruning, picking, and handling, especially if labor costs increase.
- Economically, conversion of row crops to tree crops is putting a lot of pressure on row crop producers.
- The trend towards reduced tillage this is economically viable because it reduces trips across the field.

1.1.1.2 How do you see the international market affecting agricultural viability?

- Overall, not a large amount of international export in the County
- The strength of the dollar will affect agriculture in the County. The strong dollar is a positive for the buyer but is a negative for the seller.
- The longshoreman strike which closed port prices down due to oversupply in the United States.

1.1.1.3 In regards to the local agriculture market or practices, what do you see are some strengths, weaknesses, opportunities, and threats (SWOT)?

Strengths:

- Reliable water source from the Columbia River
- Reliable climate (dry fall weather)
- Good transportation systems (access to water, air, and ground transportation)
- Strong infrastructure

- High speed internet access
- Abundant cheap electricity
- Diversity of agricultural products that support the industry

Weaknesses:

- Reliance on export to other parts of the Country, especially the east coast. This is due to the lack of large market centers near the County. Seattle is not large enough to support the industry.
- High land prices which in some cases are too high to grow certain crops.
- Lack of young, educated labor force especially for smaller producers. Some larger producers are able to bring in young producers but some of the smaller farms don't have these opportunities.

Opportunities:

- Agricultural processing facilities closer to producers:
  - Currently, many of these facilities are located outside of the County and it would be beneficial to have these closer to where the products are grown
- Expanding into the vegetable market:
  - The County has the potential to support a consistent vegetable supply
- Vertical integration of individual farms so that farms can take advantage of changing market conditions:
  - Vegetables are a good crop of vertical integration to take advantage of future adverse climatic conditions in California.
- Education opportunities for new ideas.
  - This could include training in vertical integration and informal training on new conservation practices
- New technologies such as precision agriculture, drones, mechanization, etc.
- Big Bend Community College
- Eco marketing

Threats:

- Loss of small-size producers and an increase in migrant workers. This reduces the overall size of the community which is a negative
- High capitol producers coming from California and displacing current producers
- Land conversion and rising land prices
- Groundwater shortage
- Lack of replacements for producers who retire
- Lack of adequate labor force and potential labor shortages

1.1.1.4 Do agricultural producers have the flexibility to respond to fluctuating market conditions that is needed? Are there opportunities to increase flexibility?

- Due to the large variety of crops grown in the County, over 60 types, farmers need the ability to change practices as they see fit.
- Consider having a list of conservation practices for different types of production and producers can chose from those practices and change within those practices and still be part of program (this is similar to the Conservation Stewardship Program [CSP] system).
- A website would be helpful for tracking and outreach. Additionally, assistance from the Conservation District would be helpful.
- Producers would be open to recording what they are doing outside of programs. For example, many potato growers use mustard as a cover crop but this is not being tracked.
- Consider the time it takes producers to record and track practices. Potentially implement a reward or payment for tracking.
- Increasing producer flexibility may require change in production, this requires an open mind as well as large capital investments.

1.1.1.5 What types of financial incentives are available to producers to improve the bottom line?

- Producers like the CSP approach better than the Conservation Reserve Program (CRP) approach.
- Programs that help producer's covert to better practices, such as direct seed, are very helpful. These programs reduce the barrier to entry on these practices.
- Demonstration plots, sometimes done through county extension services or commercial companies, help to demonstrate that a new practice is viable. Once it is shown the technology or practice is viable they will be more likely to implement it on their property.
- Cost share for implementing practices, payments per acre or per project, may be helpful. Having these amounts stated up front will allow the producer to price out the benefits vs. costs.

1.1.1.6 What are some programs at the regional level that you would like to see to support a more resilient local agriculture market?

- It would be good to have additional technical support and technical education provided by independent parties instead of only available through companies.
- Having an independent entity to help farmers figure out what to do on their land, that would be helpful.
- It would be useful to have a simple way to transmit and disseminate information about new practices, sometimes it is hard to find the information you need.

- Some concern over other land uses outcompeting land uses that would benefit agriculture. For example, large transportation projects being stopped due to corporations purchasing land.
- More regional programs that benefit many types of people, such as improvements to transportation.
- Would like to see continued or increased investment in unbiased government research.

1.1.1.7 At a farm level, what would help agricultural producers maintain a viable practice?

- Agriculture is already a very efficient system and produces close to a supply and demand equilibrium.
- Neighbor to neighbor conversations are more efficient at promoting conservation practices than government regulating participation. Producers will follow who they know and trust. People are generally interested in what people are trying, but they want to make sure it can work for them before they implement.

1.1.1.8 We are developing a list of conservation practices already being implemented by producers. Can you provide some unique examples of measures being implemented to address items?

- Direct seed and other reduced tillage practices are the biggest thing happening in the County.
- CSP helps to take the risk out of implementing these practices and should be utilized.
- In the County, many producers have permanent crops and there are less conservation practices available for them. However, cover crops that have specific purposes, such as growing other crops in rows, is something that could be utilized in these areas.

1.2 References

Dormaier, Dan, 2016. Agricultural Viability Phone Interview. December 16, 2016.

Kraurscheid, Sam, 2016. Agricultural Viability Phone Interview. December 19, 2016.

Leitz, Richard, 2016. Agricultural Viability Phone Interview. December 20, 2016.

Appendix B-6
Grant County Water Quality 303(d) Listings (2016)

Water Quality Parameter	Potential Agricultural-related Source
2,4,6-Trichlorophenol	Herbicide/Fungicide/Insecticide
2,4-Dinitrophenol	Pesticide
4,4'-DDD	Insecticide
4,4'-DDE	Byproduct of DDT
4,4'-DDT	Pesticide
Aldrin	Insecticide
Alpha-BHC	Insecticide
Ammonia-N	Organic waste products
Bacteria	Animal waste
Beta-BHC	Insecticide
Chlordane	Pesticide
Chlorpyrifos	Insecticide
DDT (and metabolites)	Pesticide
Dieldrin	Insecticide
Dissolved Oxygen	Organic matter decomposition
Endosulfan	Insecticide
Endosulfan I	Insecticide
Endosulfan II	Insecticide
Endosulfan Sulfate	Insecticide
Endrin	Insecticide
Endrin Aldehyde	Insecticide
Heptachlor	Insecticide
Heptachlor Epoxide	Insecticide
Hexachlorobenzene	Fungicide
Hexachlorocyclohexane (Lindane)	Insecticide
pH	Indicator
Temperature	Erosion/sediment/canopy cover
Total Chlordane	Pesticide
Total Phosphorus	Organic decomposition
Toxaphene	Insecticide

Appendix C
Benchmarks: Methods and Initial Results

APPENDIX C: Benchmarks – Methods and Initial Results

Methods

Linking Stewardship Practices to Resource Protection

Conservation practice benefits are related to critical areas functions and values through the use of conservation practice physical effect (CPPE) scores for each practice developed by U.S. Department of Agriculture (USDA; NRCS 2017), which have been tailored slightly to Grant County conditions. The CPPE describes how Natural Resources Conservation Service (NRCS) practices affect the human-economic environment (e.g., Agricultural Viability) and natural resources (e.g., Critical Functions). CPPE, developed by USDA NRCS economists, helps field planners describe in detail how each practice affects agricultural viability and natural resource critical functions. Scores range between +5 and -5, with positive scores denoting a beneficial effect, 0 denoting no effect, and negative scores having an adverse effect.

For each of the four key critical area functions (i.e., water quality, hydrology, soil, and habitat), resource concerns were averaged together to provide an overall function score. Where a resource concern was listed as "not applicable" to a particular practice, this resource concern was not factored into the average function score. The following table provides additional details on methods applied to summary tables of practice effects on resource function in Grant County:

- **Table 1: CPPE Resource Concerns for Grant County**, summarizes the resource concerns identified as applicable to Grant County conditions, pared down for applicability from the comprehensive list of resource concerns in the NRCS National CPPE Summary Tool, dated 7/28/2015 and available from the NRCS CPPE webpage (NRCS 2017) at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/data/?cid=nrcs143_009740.
- **Attachment 1: Grant County CPPE Resource Concerns and Scores,** provides a detailed summary of applicable individual resource scores (identified in Table 1) and average function scores per key critical area function for all NRCS conservation practices. Resource concerns listed as a zero (and colored in red) indicate the score is applicable to the conservation practice as having no effect. Zero scores not highlighted in red indicate a resource concern that is not applicable to the practice and is therefore not factored into the average function score.
- **Attachment 2: Grant County Practice Toolbox with CPPE Averaged Function Scores,** provides an overview of NRCS conservation practices currently implemented in Grant County, showing quantitative scores, and additional applicable and key practices (scores greater than 3) for each function category.

Table 1
CPPE Resource Concerns for Grant County

Function	Resource Concern
Soil	The soil function score averaged both soil erosion and soil condition scores based on the associated resource concerns listed below.
Soil Erosion	• Sheet and rill • Wind • Ephemeral Gully • Classic Gully • Streambank/shoreline/conveyance
Soil Condition	• Organic matter depletion • Compaction • Subsidence • Contaminants: Salts or other chemicals
Hydrology	• Excessive seepage • Excessive runoff, flooding, or ponding • Excessive subsurface water • Drifted snow • Inefficient water use on irrigated land • Inefficient water use on non-irrigated land
Water Quality	• Pesticides in surface water • Pesticides in groundwater • Nutrients in surface water • Nutrients in groundwater • Salts in surface water • Salts in groundwater • Excess pathogens and chemicals from manure, bio-solids or compost applications in surface water • Excess pathogens and chemicals from manure, bio-solids or compost applications in groundwater • Excessive sediments in surface water • Elevated water temperature • Petroleum, heavy metals, and other pollutants transported to surface water • Petroleum, heavy metals, and other pollutants transported to groundwater
Habitat	• Inadequate food • Inadequate cover/shelter • Inadequate water • Inadequate space

Application for Future Practices

The spreadsheets in Attachments 1 and 2 may be used to track enrollment in future practices, and to continue to assess functional indicators of these practices. New NRCS practices may also be added to Grant County's palette of protection and enhancement tools (Attachment 2).

For practices outside of NRCS, equivalent function scores should be developed to estimate the benefit or impact on soil health, hydrology, water quality, and fish and wildlife habitat based on the understanding that scores range from +5 and -5 with positive scores denoting a beneficial effect and negative scores indicating an impact. The suggested steps for this process include:

- Assessing whether the new practice is similar to an existing NRCS practices and using the resource concern scores from the existing NRCS practice as a starting point to develop function scores
- Use experience and available technical information to develop scores, understanding although a practice may have a beneficial effect on a target resource, there may be impacts to other resources. Also, not all practices will have an effect on all possible resource concerns; many will have no effect, and some will not be applicable and should be listed as a zero.

Initial Results (2011 to 2016)

To track performance from implemented conservation practices from 2011 to 2016, enrollment in conservation practices was tabulated and average function scores (Attachment 2) were applied. This provided a functional indicator that accounted for the beneficial and adverse effects of each practice.

Although NRCS enrollment data is available since 2011, the discontinuation of practices during that period was not recorded. The rate of discontinuation of practices often varies based on whether implemented practices involve stewardship investment (e.g., irrigation management systems), stewardship actions (e.g., cover cropping), or permanent conversion into conservation easements. Table 2 summarizes the proposed approach to accounting for the varied disenrollment rates based on some of these categories of practices.

Table 2
Calculating Disenrollment for Conservation Practices

Assumed Range of Disenrollment/ Discontinuation	Conservation Practice Category	Example Practices
None	**Easements and Infrastructure** • Permanent Conservation Practices	• Permanent Easements • Major Infrastructure

Assumed Range of Disenrollment/ Discontinuation	Conservation Practice Category	Example Practices
Lower 0-3%	**Conservation Investments** • High Barriers to Entry/Exit - Conservation investments - Maintenance cost - Effectiveness • Increases Land Productivity • Lowers Cost	• Tillage Management • Pest Management • Nutrient Management • Irrigation Management • Fencing
Higher 0-6%	**Conservation Actions** • Low Barriers to Entry/Exit - Easily removed • Reduced land in production • Rotational use - Market driven rotation • Reliance on unstable conservation funding or incentives (e.g., CRP)	• Habitat Restoration • Prescribed Grazing • Cover Crop • Range Planting

Figures 1 through 4 illustrates the functional indicator results from 2011 to 2016 based on reported practices enrolled/implemented and estimated discontinuation of practices within that time period. Figures 1 through 4 indicate a net gain in function over time for soil, hydrology, water quality, and habitat.

Figure 1
Water Quality Functional Indictors: 2011 to 2016 NRCS Practice Enrollments

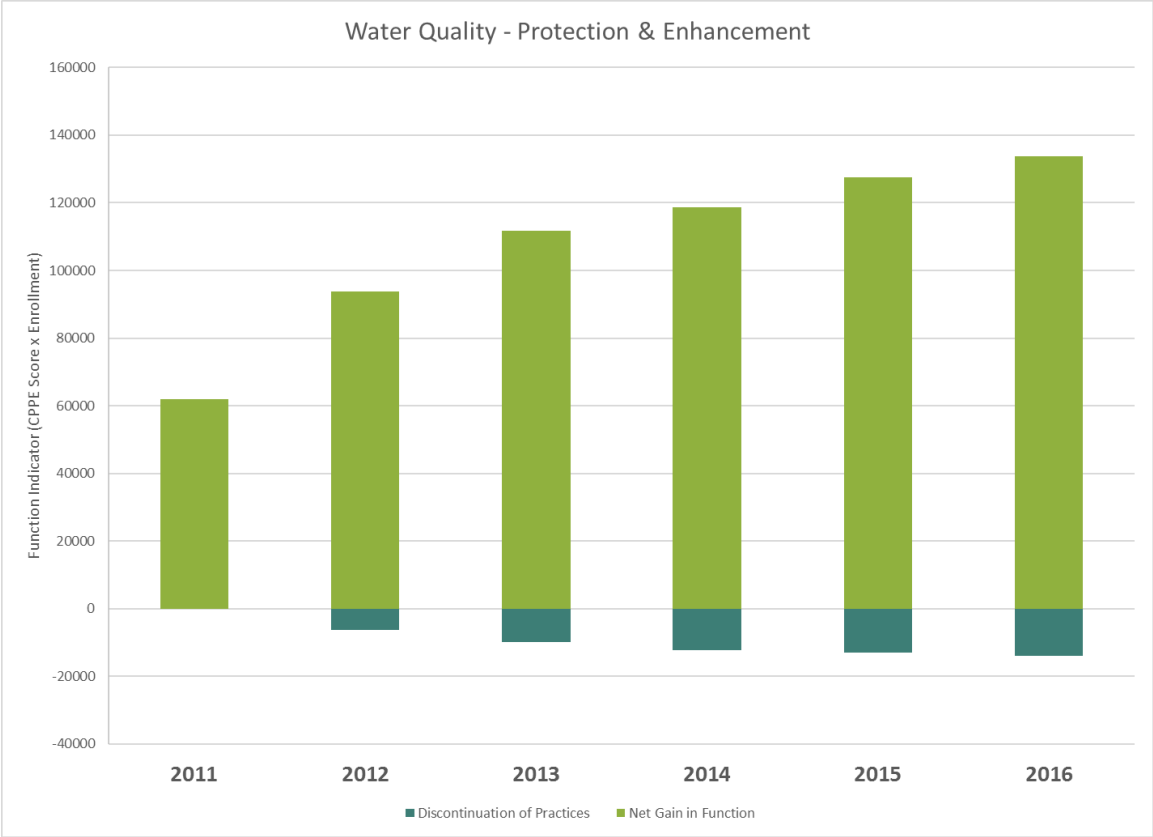


Figure 2
Hydrology Functional Indictors: 2011 to 2016 NRCS Practice Enrollments

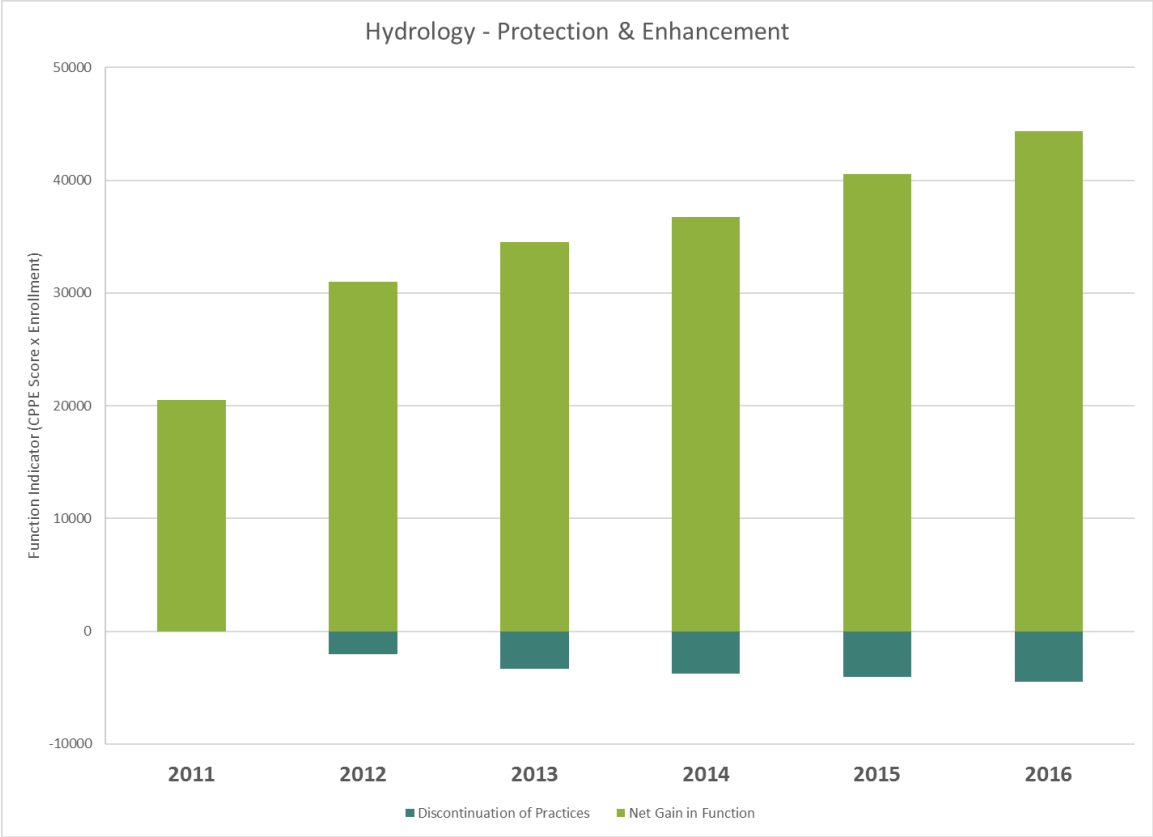


Figure 3
Soil Functional Indictors: 2011 to 2016 NRCS Practice Enrollments

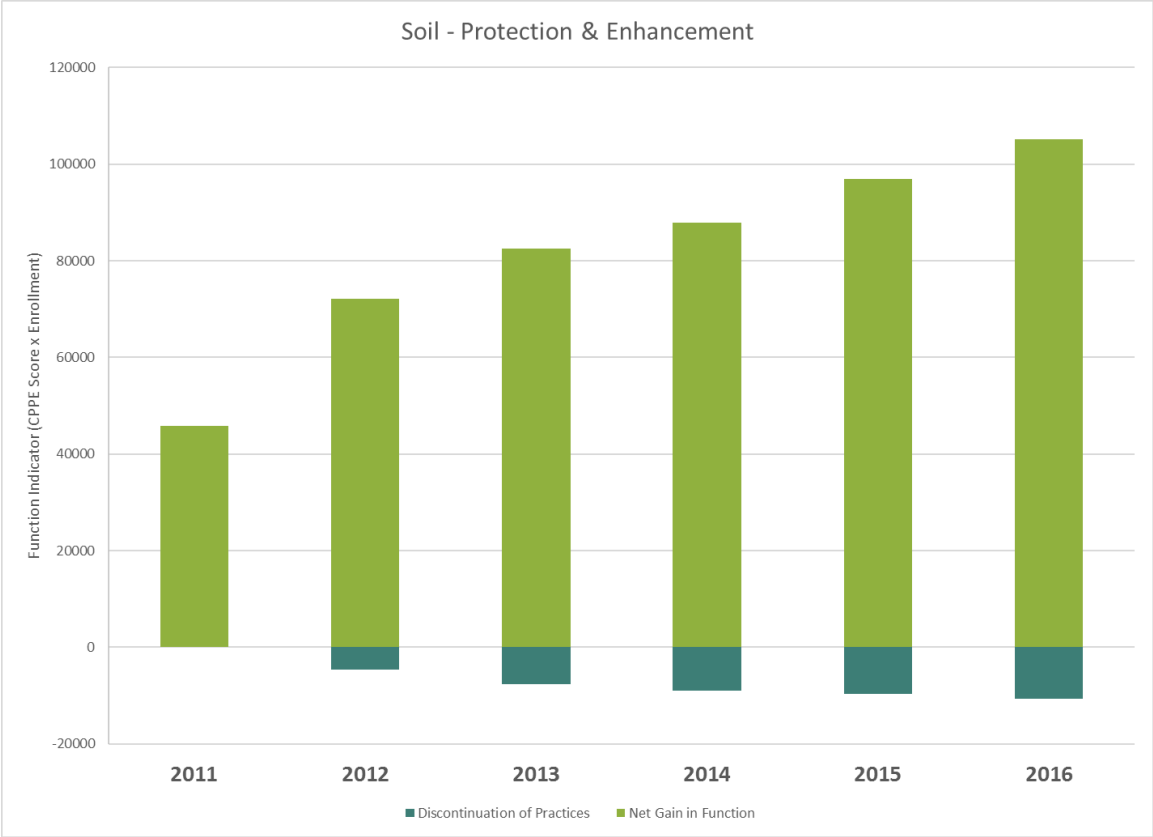
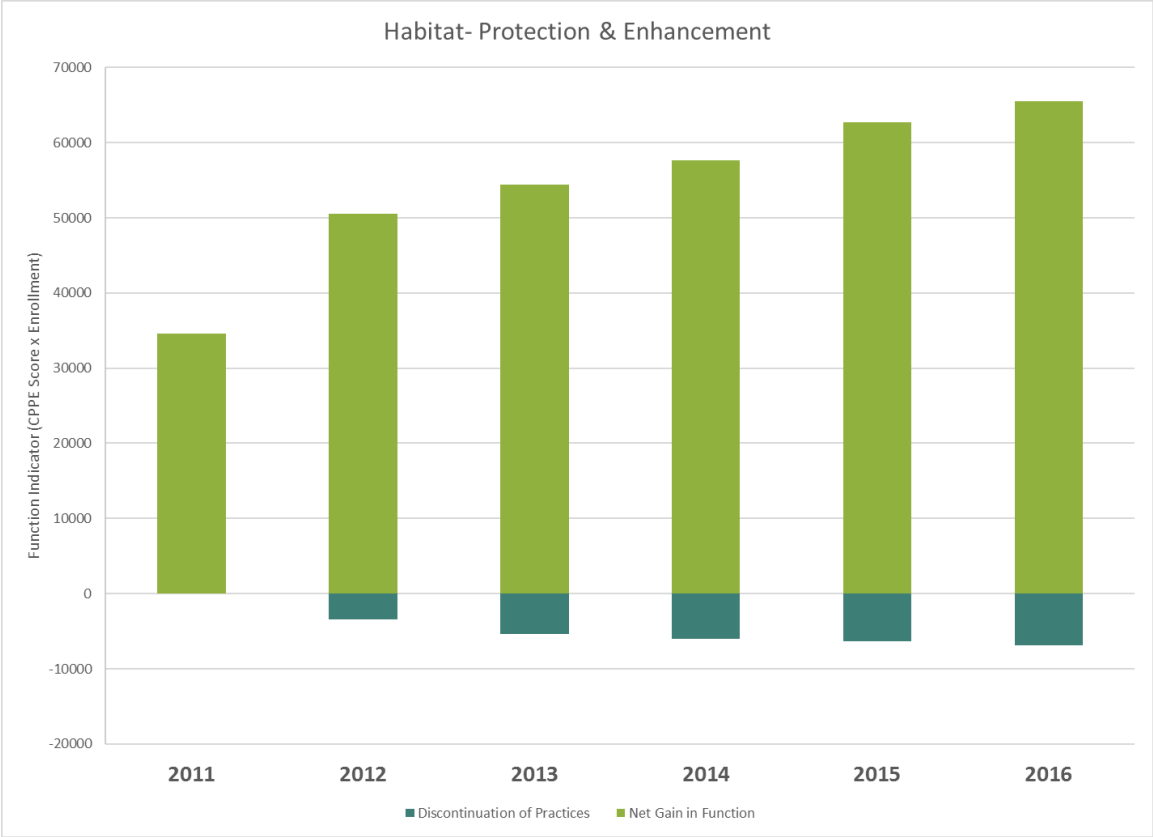


Figure 4
Habitat Functional Indictors: 2011 to 2016 NRCS Practice Enrollments



Reference

NRCS (Natural Resources Conservation Service), 2017. NRCS Conservation Practice Physical Effects CPPE/NRCS Economics. Cited March 2017. Available from: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/data/?cid=nrcs143_009740.

Attachment 1
Grant County CPPE Resource Concerns and Scores

Grant County VSP Work Plan	Code	Soil Erosion – Sheet and Rill	Soil Erosion – Wind	Soil Erosion – Ephemeral Gully	Soil Erosion – Classic Gully	Soil Erosion – Streambank/ Shoreline/ Conveyance	Soil Erosion Average	Soil Condition – Organic Matter Depletion	Soil Condition – Compaction	Soil Condition – Subsidence	Soil Condition – Contaminants: Salts or Other Chemicals	Soil Condition Average	Water Quantity – Excessive Seepage	Water Quantity – Excessive Runoff, Flooding, or Ponding	Water Quantity – Excessive Subsurface Water	Water Quantity – Drifted Snow	Water Quantity – Inefficient Water Use on Irrigated Land	Water Quantity – Inefficient Water Use on Nonirrigated Land	Hydrology Average	Water Quality Degradation - Pesticides in Surface Water	Water Quality Degradation - Pesticides in Groundwater	Water Quality Degradation - Nutrients in Surface water	Water Quality Degradation - Nutrients in Groundwater	Water Quality Degradation - Salts in Surface Water	Water Quality Degradation - Salts in Groundwater	Water Quality Degradation - Excess Pathogens and Chemicals from Manure, Bio-solids or Compost Applications in Surface Water	Water Quality Degradation - Excess Pathogens and Chemicals from Manure, Bio-solids or Compost Applications in Groundwater	Water Quality Degradation - Excessive Sediment in Surface Water	Water Quality Degradation - Elevated Water Temperature	Water Quality Degradation - Petroleum, Heavy Metals and Other Pollutants Transported to Surface Water	Water Quality Degradation - Petroleum, Heavy Metals and Other Pollutants Transported to Groundwater	Water Quality Average	Fish and Wildlife – Inadequate Food	Fish and Wildlife – Inadequate Cover/Shelter	Fish and Wildlife – Inadequate Water	Fish and Wildlife – Inadequate Space	Habitat Average
Access Control	472	3	1	4	4	5	3.40	1	4	0	0	2.50	1	1	2	0	0	3	1.75	1	0	1	1	0	0	1	1	3	3	1	1	1.44	3	3	1	1	2.00
Access Road	560	1	0	1	1	0	1.00	0	2	0	0	2.00	0	1	0	0	2	0	1.50	0	0	0	0	0	0	0	0	1	0	0	0	1.00	0	0	0	-1	-1.00
Agrichemical Handling Facility	309	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	5	5	5	5	0	0	0	0	0	0	0	0	5.00	0	0	0	0	0.00
Air Filtration and Scrubbing	371	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Alley Cropping	311	5	5	5	3	0	4.50	5	2	0	1	2.67	1	1	2	3	3	0	2.00	3	1	3	1	1	1	3	1	3	0	1	1	1.73	2	2	0	3	2.33
Amending Soil Properties with Gypsum Products	333	1	1	0	0	0	1.00	1	0	0	1	1.00	0	1	0	0	1	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Amendments for Treatment of Agricultural Waste	591	0	0	0	0	0	0.00	1	0	0	0	0.50	0	0	0	0	1	0	0.50	0	0	2	2	2	2	2	2	0	0	2	2	2.00	0	0	0	0	0.00
Anaerobic Digester	366	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	2	0	0	0	2	0	0	0	0	0	0.67	0	0	0	0	0.00
Animal Mortality Facility	316	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	2	2	0	0	2	2	0	0	0	0	2.00	0	0	0	0	0.00
Anionic Polyacrylamide (PAM) Erosion Control	450	2	2	2	0	0	2.00	0	2	0	0	2.00	0	0	0	0	1	1	1.00	2	-1	2	-1	0	0	0	0	4	0	1	0	1.17	0	0	0	0	0.00
Aquaculture Ponds	397	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	-2	-2	0	0	-2	0	0	-2	0	0	-2.00	0	0	1	0	1.00
Aquatic Organism Passage	396	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	2	0	0	2.00	0	2	1	5	2.67
Bedding	310	2	0	0	0	0	2.00	-1	-1	0	1	-0.33	0	5	0	0	0	-1	2.00	-2	1	-2	1	-2	1	-2	1	-1	0	-2	1	-0.55	0	0	0	0	0.00
Bivalve Aquaculture Gear and Biofouling Control	400	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	2	0	0	0	2	0	0	0	0	0	2.00	0	0	2	0	2.00
Brush Management	314	1	1	1	1	0	1.00	0	0	0	0	0.00	0	1	0	0	0	2	1.50	-1	0	0	0	0	0	0	0	2	0	0	0	0.50	2	2	0	1	1.67
Building Envelope Improvement	672	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Channel Bed Stabilization	584	0	0	0	2	2	2.00	0	0	0	0	0.00	2	0	0	0	0	0	2.00	0	0	0	0	0	0	0	0	1	1	0	0	1.00	1	1	1	2	1.25
Clearing & Snagging	326	0	0	0	0	2	2.00	0	0	0	0	0.00	0	2	0	0	0	0	2.00	0	0	0	0	0	0	0	0	-2	-1	0	0	-1.50	-2	-2	-1	-2	-1.75
Combustion System Improvement	372	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Composting Facility	317	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	2	2	0	0	2	2	0	0	0	0	2.00	0	0	0	0	0.00
Conservation Cover	327	4	4	1	1	1	2.20	5	3	0	2	3.33	1	2	1	1	0	0	1.25	2	2	4	4	5	2	1	2	4	0	0	0	2.89	4	4	0	2	3.33
Conservation Crop Rotation	328	4	4	0	0	0	4.00	4	1	0	2	2.33	1	2	1	0	2	2	1.60	2	2	2	2	1	2	1	0	2	0	0	0	1.75	2	2	0	2	2.00
Constructed Wetland	656	0	0	0	0	0	0.00	0	0	0	0	0.00	0	2	0	0	0	0	2.00	2	1	4	1	1	1	4	3	5	0	4	1	2.25	3	3	0	2	2.00
Contour Buffer Strips	332	3	0	0	0	0	3.00	2	0	0	0	2.00	-2	1	-1	0	0	0	-0.67	2	0	2	-1	1	-1	1	-1	2	0	0	0	0.56	2	2	0	2	2.00
Contour Farming	330	2	0	0	0	0	2.00	1	0	0	0	1.00	-2	1	-1	0	0	1	-0.25	1	-1	2	-1	1	-1	1	0	2	0	0	0	0.50	0	0	0	0	0.00
Contour Orchard and Other Perennial Crops	331	4	0	1	0	0	2.50	2	0	0	0	2.00	-2	1	-1	0	1	2	0.20	1	-1	2	-1	1	-1	0	0	2	0	0	0	0.43	0	0	0	0	0.00
Controlled Traffic Farming	334	0	0	0	0	0	0.00	0	4	0	0	4.00	0	0	0	0	1	1	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Cover Crop	340	4	4	3	0	0	3.67	2	2	0	1	1.25	1	2	1	0	1	2	1.40	2	2	2	2	0	1	1	2	2	0	0	0	1.75	2	2	0	2	2.00
Critical Area Planting	342	5	5	5	4	4	4.60	5	2	0	1	2.67	0	0	0	0	0	0	0.00	0	0	2	1	0	0	0	0	4	0	0	0	2.33	2	2	0	2	2.00
Cross Wind Ridges	588	0	4	0	0	0	4.00	1	0	0	0	1.00	0	0	0	0	0	0	0.00	1	0	1	0	1	0	0	0	1	0	0	0	1.00	0	0	0	0	0.00
Cross Wind Trap Strips	589C	0	4	0	0	0	4.00	2	0	0	0	2.00	0	0	0	0	0	0	0.00	2	0	2	0	1	0	0	0	1	0	0	0	1.50	0	2	0	2	2.00
Dam	402	0	0	0	2	1	1.50	0	0	0	-1	-1.00	-2	2	-1	0	2	0	0.25	0	0	0	-1	0	0	-2	0	2	0	0	0	-0.25	2	2	0	2	1.50
Dam, Diversion	348	0	0	0	0	-1	-1.00	0	0	0	0	0.00	0	2	0	0	2	2	2.00	0	0	0	0	0	0	0	0	0	-2	0	0	-2.00	-2	-2	-2	-2	-2.00
Deep Tillage	324	0	0	0	0	0	0.00	-4	5	-1	2	0.50	-2	0	2	0	2	2	1.00	0	0	1	-2	1	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Denitrifying Bioreactor	605	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	3	1	0	0	0	0	0	0	0	0	2.00	0	0	0	0	0.00
Dike	356	0	0	0	1	-2	-0.50	0	0	0	0	0.00	-1	2	-1	0	0	0	0.00	2	2	0	0	0	0	0	0	0	0	0	0	1.33	-2	-2	0	1	-0.75
Diversion	362	1	0	2	2	1	1.50	0	0	0	0	0.00	-1	2	2	0	2	2	1.40	1	1	0	-1	0	0	1	0	2	0	1	0	0.71	0	0	0	0	0.00
Drainage Water Management	554	0	2	0	0	0	2.00	2	-1	2	0	1.00	1	-2	2	0	0	0	0.33	2	2	1	-1	0	0	1	1	0	0	2	0	0.89	0	0	2	2	2.00
Dry Hydrant	432	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	-1	-1	-1.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Dust Control from Animal Activity on Open Lot Surfaces	375	0	2	0	0	0	2.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	1	0	1	0	1	0	0	0	0	0	1.00	0	0	0	0	0.00
Dust Control on Unpaved Roads and Surfaces	373	2	5	0	0	0	3.50	0	0	0	-1	-1.00	0	0	0	0	0	0	0.00	0	0	-1	0	-1	0	0	0	1	0	-1	0	-0.50	0	0	0	0	0.00
Early Successional Habitat Development/Mgt.	647	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	-2	0	0	-1.00	4	4	0	4	4.00
Emergency Animal Mortality Management	368	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	2	2	0	0	2	2	0	0	0	0	2.00	0	0	0	0	0.00
Farmstead Energy Improvement	374	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	-2	0	0	-2.00	0	0	0	0	0.00
Feed Management	592	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	2	2	1	0	1	1	0	0	0	0	1.40	0	0	0	0	0.00
Fence	382	1	0	0	0	0	1.00	0	1	0	0	1.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	2	0	0	0	0	0	2.00	0	0	0	0	0.00
Field Border	386	4	4	1	0	1	2.50	4	2	0	0	2.00	0	1	0	0	0	0	1.00	2	2	1	1	0	1	1	0	2	0	0	0	1.43	2	2	0	2	2.00
Field Operations Emissions Reduction	376	1	4	0	0	0	2.50	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Filter Strip	393	0	0	0	0	0	0.00	5	0	0	0	5.00	0	0	0	0	0	0	0.00	2	1	5	2	1	1	3	1	5	0	4	1	2.36	2	2	0	2	2.00
Firebreak	394	-1	-1	-1	-1	0	-0.80	-2	-2	0	0	-2.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	-1	0	0	0	-1.00	0	0	0	-1	-1.00
Fish Raceway or Tank	398	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	-1	-1	-1	0	-1	-1	0	-1	0	0	-1.00	0	0	0	0	0.00
Fishpond Management	399	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	-2	0	0	0	0	0	0	0	0	-2.00	4	4	2	4	3.50
Forage and Biomass Planting	512	1	1	0	0	0	1.00	1	2	0	0	1.50	0	1	0	0	0	0	1.00	1	0	1	0	0	0	1	0	1	0	1	0	1.00	1	1	0	0	1.00
Forage Harvest Management	511	1	1	0	0	0	1.00	1	3	0	0	2.00	0	0	0	0	1	1	1.00	2	0	1	0	0	0	1	0	0	0	1	0	1.25	1	1	0	0	1.00
Forest Stand Improvement	666	1	0	1	1	0	0.75	1	-1	0	0	0.00	0	0	0	0	0	3	3.00	0	0	1	2	1	0	1	1	0	1	1	1	0.75	3	1	0	3	2.33
Forest Trails and Landings	655	-1	0	-1	-1	0	-0.75	-1	1	0	0	0.00	0	0	0	0	0	0	0.00	0	0	1	0	0	0	0	0	0	0	0	0	0.50	1	1	0	-1	0.33
Fuel Break	383	-1	-1	-1	-1	0	-1.00	-3	-1	0	0	-2.00	0	0	-1	0	0	0	-1.00	-1	-1	0	0	0	0	0	0	-1	0	0	0	-1.00	1	-1	0	0	0.40
Grade Stabilization Structure	410	0	0	0	2	2	2.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	2	0	0	0	1.00	2	2	1	0	1.67
Grassed Waterway	412	0	0	5	4	1	3.33	3	0	0	-1	1.00	0	3	2	0	0	0	2.50	2	0	2	0	0	0	1	0	2	0	1	0	1.33	1	1	1	1	1.00
Grazing Land Mechanical Treatment	548	1	1	0	0	0	1.00	1	0	0	0	1.00	0	2	0	0	0	2	2.00	0	0	1	0	0	0	1	0	5	0	0	0	2.33	0	0	0	0	0.00
Groundwater Testing	355	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Heavy Use Area Protection	561	2	2	2	2	0	2.00	0	1	0	0	0.50	0	-1	0	0	0	0	-1.00	0	0	1	0	0	0	2	0	2	0	0	0	1.67	0	0	0	0	0.00
Hedgerow Planting	422	0	1	0	0	0	1.00	2	1	0	0	1.50	0	0	0	2	0	0	2.00	1	0	2	0	0	0	0	0	0	1	0	0	1.33	4	4	0	4	4.00
Herbaceous Weed Control	315	4	4	2	2	4	3.20	0	0	0	0	0.00	0	0	0	0	2	0	2.00	-1	0	0	0	0	0	0	0	0	0	0	0	-0.25	2	2	0	1	1.67
Herbaceous Wind Barriers	603	0	4	0	0	0	4.00	2	0	0	0	2.00	0	0	0	0	0	3	3.00	1	0	1	0	0	0	0	0	1	0	0	0	1.00	2	2	0	2	2.00
High Tunnel System	325	0	0	-1	0	0	-1.00	1	0	0	0	1.00	0	-3	0	0	0	-1	-2.00	0	0	0	0	0	0	0	0	-1	0	0	0	-1.00	0	0	0	0	0.00
Hillside Ditch	423	2	0	2	2	1	1.75	0	0	0	0	0.00	0	4	0	0	0	1	2.50	1	0	-1	-1	0	0	-2	0	2	0	-1	0	-0.25	0	0	1	0	1.00
Integrated Pest Management	595	2	2	2	2	0	2.00	2	2	0	0	2.00	0	0	0	0	0	0	0.00	5	5	0	0	0	0	0	0	2	0	0	0	4.00	2	0	2	0	2.00
Irrigation Canal or Lateral	320	0	0	0	0	0	0.00	0	0	0	0	0.00	0	2	-2	0	5	0	1.67	0	0	-2	0	0	0	-2	0	0	0	0	0	-1.33	0	0	1	0	1.00
Irrigation Ditch Lining	428	0	0	0	0	0	0.00	0	0	0	0	0.00	1	0	-1	0	5	0	1.67	0	0	1	1	1	2	-1	1	1	0	-1	1	0.60	0	0	1	0	1.00
Irrigation Field Ditch	388	0	0	0	0	0	0.00	0	0	0	0	0.00	0	1	-1	0	5	0	1.25	0	0	0	0	0	0	-1	0	0	0	1	0	0.00	0	0	1	0	1.00
Irrigation Land Leveling	464	1	0	1	0	0	1.00	-2	-2	0	-1	-1.67	0	1	2	0	4	0	2.33	2	2	2	2	0	2	2	2	1	0	1	1	1.55	0	0	0	0	0.00
Irrigation Pipeline	430	0	0	0	2	0	2.00	0	0	0	0	0.00	1	0	1	0	2	0	1.33	0	0	1	0	1	2	1	1	1	0	0	1	0.89	0	0	0	0	0.00
Irrigation Reservoir	436	0	0	0	2	1	1.50	0	0	0	0	0.00	-1	2	-1	0	2	0	0.50	0	0	0	-1	0	0	0	0	2	0	0	0	0.33	2	-1	2	-1	0.50
Irrigation System, Microirrigation	441	0	0	0	0	0	0.00	0	0	0	1	0.50	2	2	2	0	2	0	2.00	2	2	2	2	0	2	2	1	1	0	1	1	1.33	0	0	1	0	1.00
Irrigation System, Surface & Subsurface	443	0	1	0	-1	-1	-0.33	0	-1	0	0	-0.50	1	1	1	0	2	0	1.25	1	1	1	1	1	1	1	1	0	0	1	1	0.91	0	0	1	0	1.00
Irrigation System, Tailwater Recovery	447	0	0	1	1	1	1.00	0	-1	0	-1	-1.00	-1	1	-1	0	2	0	0.25	2	2	2	-1	1	-1	1	0	1	0	4	-1	0.73	0	0	1	0	1.00
Irrigation Water Management	449	0	2	0	0	0	2.00	1	0	0	2	1.50	0	0	1	0	2	0	1.50	2	2	2	2	2	2	2	2	2	0	2	2	1.82	0	0	0	0	0.00
Karst Sinkhole Treatment	527	0	0	4	4	0	4.00	0	0	0	2	2.00	0	-2	0	0	0	0	-2.00	2	2	2	2	0	2	2	2	2	0	0	2	2.00	0	0	0	0	0.00
Land Clearing	460	0	0	0	0	0	0.00	-3	-1	0	0	-2.00	0	-1	0	0	0	0	-1.00	-1	0	-1	0	0	0	-1	0	-1	-2	-1	0	-1.00	-2	-2	0	-2	-2.00
Land Reclamation, Abandoned Mined Land	543	4	4	4	1	0	3.25	3	1	0	4	2.67	0	3	0	0	0	0	3.00	0	0	0	0	1	1	3	0	4	0	0	1	2.00	2	2	0	1	1.67
Land Reclamation, Currently Mined Land	544	4	4	4	1	0	3.25	3	1	0	4	2.67	0	3	0	0	0	0	3.00	0	0	0	0	1	1	3	0	4	0	0	1	2.00	2	2	0	1	1.67
Land Reclamation, Landslide Treatment	453	2	2	2	0	0	2.00	2	0	0	0	0.67	2	0	2	0	0	0	2.00	0	0	0	0	0	0	1	0	4	0	4	0	3.00	2	2	0	0	2.00
Land Reclamation, Toxic Discharge Control	455	2	2	2	0	0	2.00	0	0	0	2	2.00	2	1	2	0	0	0	1.67	0	0	0	0	0	2	0	0	0	0	4	2	2.67	2	2	0	0	2.00
Land Smoothing	466	0	0	1	0	0	0.50	-2	-2	0	-1	-1.67	2	2	2	0	2	2	2.00	1	1	1	2	0	0	0	0	1	0	1	0	1.17	0	0	0	-1	-1.00
Lighting System Improvement	670	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Lined Waterway or Outlet	468	0	0	5	2	0	3.50	0	0	0	0	0.00	2	2	2	0	0	0	2.00	0	0	0	2	0	0	0	0	2	0	0	0	2.00	-2	1	0	0	-0.50
Livestock Pipeline	516	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Livestock Shelter Structure	576	0	0	0	0	3	3.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	3	0	0	0	2	0	2	0	0	0	2.33	0	0	0	0	0.00
Mine Shaft & Adit Closing	457	0	0	0	0	0	0.00	0	0	2	0	2.00	0	0	2	0	0	0	2.00	0	0	0	0	0	2	0	0	0	0	2	1	1.67	0	0	0	2	2.00
Mole Drain	482	1	0	1	0	-1	0.20	-2	1	-2	2	-0.25	2	2	2	0	0	0	1.20	1	1	-4	2	-2	2	0	2	1	0	0	2	0.56	0	0	0	0	0.00
Monitoring Well	353	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Mulching	484	4	4	0	0	0	4.00	1	0	0	1	1.00	-1	1	-1	0	2	2	0.60	2	0	2	-1	1	-1	0	0	2	0	0	0	0.83	1	1	0	0	1.00
Multi-Story Cropping	379	1	1	1	1	0	1.00	5	2	1	1	2.25	1	1	1	0	0	0	1.00	3	1	1	0	1	0	1	1	1	0	1	1	1.10	3	1	0	1	1.67
Nutrient Management	590	0	0	0	0	0	0.00	2	-1	0	4	1.67	0	0	0	0	0	0	0.00	0	0	5	5	3	3	4	4	0	0	2	2	3.50	0	0	0	0	0.00
Obstruction Removal	500	0	0	0	0	0	0.00	1	-1	0	0	0.00	0	0	0	2	0	0	2.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	-2	0	0	-2.00
On-Farm Secondary Containment Facility	319	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	5	5	5.00	0	0	0	0	0.00
Open Channel	582	0	0	0	0	2	2.00	0	0	0	0	0.00	1	5	2	0	0	0	2.67	0	0	-1	0	0	0	0	0	0	0	-1	0	-0.67	0	0	-2	0	-0.50
Pond	378	0	0	0	2	1	1.50	0	0	0	-1	-1.00	-2	2	-1	0	2	2	0.60	0	0	2	-1	0	0	-2	0	2	0	0	0	0.20	2	2	4	2	2.50
Pond Sealing or Lining, Concrete	522	0	0	0	0	0	0.00	0	0	0	1	1.00	1	0	2	0	2	2	1.75	0	0	2	2	0	3	0	2	0	0	0	1	2.00	0	0	1	0	1.00
Pond Sealing or Lining, Compacted Soil Treatment	520	0	0	0	0	0	0.00	0	0	0	1	1.00	1	0	2	0	2	2	1.75	0	0	2	2	0	3	0	2	0	0	0	1	2.00	0	0	1	0	1.00
Pond Sealing or Lining, Flexible Membrane	521A	0	0	0	0	0	0.00	0	0	0	1	1.00	1	0	2	0	2	2	1.75	0	0	2	2	0	3	0	2	0	0	0	1	2.00	0	0	1	0	1.00
Precision Land Forming	462	0	0	2	4	0	2.00	-2	-1	0	1	-0.67	2	2	2	0	0	2	2.00	1	1	1	2	0	1	0	1	1	0	1	1	1.11	0	0	0	0	0.00
Prescribed Burning	338	2	2	1	1	1	1.40	1	0	-1	-1	-0.33	0	1	0	0	0	0	1.00	0	0	2	1	0	0	0	0	1	0	1	0	1.25	2	2	0	4	2.67
Prescribed Grazing	528	4	4	3	1	3	3.00	4	2	0	2	2.67	0	1	0	0	0	2	1.50	2	1	1	1	2	1	1	1	2	1	0	0	1.30	2	2	0	4	2.67
Pumping Plant	533	0	0	0	0	0	0.00	0	0	2	0	2.00	2	2	2	0	2	2	2.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0.00
Range Planting	550	4	4	4	2	2	3.20	4	4	0	1	3.00	0	0	0	1	0	2	0.75	2	2	1	1	1	1	1	1	2	1	2	1	1.33	2	2	0	4	2.67
Recreation Area Improvement	562	1	1	1	1	1	1.00	1	1	0	0	1.00	0	1	0	0	0	0	1.00	1	1	0	0	0	0	0	0	1	0	0	0	1.00	1	1	0	-1	0.33
Recreation Land Grading and Shaping	566	0	0	0	4	2	1.20	1	0	0	0	0.50	0	2	0	0	0	0	2.00	0	0	0	0	0	0	0	0	2	0	0	0	2.00	-2	-2	0	-2	-2.00
Residue and Tillage Management, No Till	329	4	4	0	0	0	4.00	2	2	0	0	2.00	-1	2	-1	0	2	2	0.80	4	0	2	-1	0	0	1	0	4	0	0	0	2.00	2	2	0	1	1.67
Residue and Tillage Management, Reduced Till	345	4	4	0	0	0	4.00	2	1	0	0	1.50	0	1	0	0	1	2	1.33	4	0	2	0	1	0	1	0	3	0	0	0	2.20	2	2	0	1	1.67
Restoration and Management of Rare or Declining Habitats	643	2	2	2	0	0	2.00	0	0	0	-1	-1.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	2	2	0	0	2.00	4	4	4	4	4.00
Riparian Forest Buffer	391	3	2	1	3	4	2.60	4	2	0	1	2.33	1	-1	2	0	0	0	0.67	3	1	5	5	1	1	3	1	5	5	3	1	2.83	5	5	1	5	4.00
Riparian Herbaceous Cover	390	2	2	1	0	4	2.25	4	4	0	2	3.33	2	-3	2	0	0	0	0.33	2	2	5	5	1	1	3	2	4	2	2	1	2.50	4	4	2	4	3.50
Road/Trail/Landing Closure and Treatment	654	5	1	5	5	4	4.00	5	2	0	0	2.33	1	3	4	0	0	1	2.25	0	0	1	1	0	0	1	1	3	1	3	1	1.50	1	1	1	3	1.50
Rock Barrier	555	5	0	5	1	1	3.00	0	0	0	0	0.00	1	0	1	2	0	0	1.33	0	0	0	0	1	-1	1	0	2	0	1	0	0.80	0	0	0	0	0.00
Roof Runoff Structure	558	1	0	3	1	1	1.50	0	0	0	0	0.00	1	-1	1	0	0	3	1.00	0	0	2	2	2	0	2	0	1	0	0	0	1.80	0	0	0	0	0.00
Roofs and Covers	367	0	0	0	0	0	0.00	0	0	0	0	0.00	0	-1	0	0	0	0	-1.00	0	0	0	0	0	0	0	1	0	0	1	1	1.00	0	0	0	0	0.00
Row Arrangement	557	3	1	3	0	0	2.33	1	0	0	1	1.00	-1	2	-1	0	4	4	1.60	1	-1	-2	2	0	0	1	0	2	0	0	0	0.43	0	0	0	0	0.00
Salinity and Sodic Soil Management	610	0	0	0	0	0	0.00	0	0	0	2	2.00	0	0	0	0	2	2	2.00	0	0	0	0	-2	-2	0	-1	0	0	0	-1	-1.50	0	0	0	0	0.00
Saturated Buffer	604	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	5	0	0	0	0	0	0	0	0	0	5.00	0	0	0	0	0.00
Sediment Basin	350	0	0	2	2	0	1.33	0	0	0	0	0.00	-2	2	-2	0	0	0	-0.67	2	-1	5	-1	2	-1	2	-1	4	0	2	-1	1.00	-1	-1	1	0	-0.33
Shallow Water Development and Management	646	0	0	0	0	0	0.00	1	0	0	0	1.00	0	2	0	0	0	0	2.00	0	0	1	1	0	-1	2	-1	2	0	2	1	0.70	4	2	2	4	3.00
Short Term Storage of Animal Waste and Byproducts	318	0	0	0	0	0	0.00	1	1	0	0	1.00	0	0	0	0	0	0	0.00	0	0	4	2	2	1	2	2	0	0	0	1	2.00	0	0	0	0	0.00
Silvopasture Establishment	381	4	3	3	2	2	2.80	3	0	0	0	3.00	1	2	1	2	0	2	1.60	2	1	3	2	1	1	1	1	3	1	1	1	1.50	1	1	0	1	1.00
Spoil Spreading	572	0	0	0	0	0	0.00	1	-1	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	2	0	0	0	2.00	0	0	0	0	0.00
Spring Development	574	0	0	0	1	1	1.00	0	-1	0	0	-1.00	2	1	2	0	2	2	1.80	0	0	0	0	1	0	1	0	1	0	2	0	1.25	0	0	4	2	3.00
Sprinkler System	442	0	2	0	0	0	2.00	0	-1	0	2	0.50	0	2	1	0	5	0	2.67	2	2	2	1	2	2	2	1	1	0	1	1	1.55	0	0	1	0	1.00
Stormwater Runoff Control	570	0	0	2	0	3	2.50	0	1	0	0	1.00	-1	4	-1	0	0	0	0.67	0	0	2	0	0	0	0	0	4	0	2	0	2.67	0	0	0	0	0.00
Streambank and Shoreline Protection	580	0	0	0	0	4	4.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	1	0	0	0	1	0	2	1	0	0	1.25	2	2	0	2	1.50
Stream Crossing	578	0	0	0	0	2	2.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	-1	0	0	0	-3	0	2	0	0	0	-0.67	0	0	0	0	0.00
Stream Habitat Improvement and Management	395	0	0	0	0	5	5.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	2	2	0	0	2.00	2	3	3	4	3.00
Stripcropping	585	4	4	0	0	0	4.00	2	0	0	0	2.00	-2	1	-1	1	0	1	0.00	2	0	2	0	1	-1	1	0	2	0	0	0	1.17	2	2	0	1	1.67
Structure for Water Control	587	0	0	0	0	0	0.00	0	0	0	0	0.00	0	2	0	0	2	2	2.00	0	0	0	0	0	0	0	0	1	1	0	0	1.00	0	0	2	0	2.00
Structures for Wildlife	649	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	4	0	0	4.00
Subsurface Drain	606	4	-1	4	1	1	1.80	-2	2	-2	2	0.00	4	4	4	0	2	1	3.00	2	2	-2	1	-2	2	0	1	2	0	0	1	0.70	0	0	0	0	0.00
Surface Drainage, Field Ditch	607	1	-1	2	0	0	0.67	-2	1	-1	2	0.00	0	2	2	0	2	2	2.00	0	1	-2	1	-2	1	-2	1	1	0	-2	1	-0.20	0	0	0	0	0.00
Surface Drainage, Main or Lateral	608	0	-1	2	0	0	0.50	0	0	0	0	0.00	0	2	2	0	2	2	2.00	0	0	-2	1	-2	2	-2	2	-1	0	-2	2	-0.22	0	0	0	0	0.00
Surface Roughening	609	0	3	0	0	0	3.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	-1	1	0	0	0	0.00	0	0	0	0	0.00
Terrace	600	5	1	4	2	1	2.60	2	-1	0	0	0.50	-1	4	-1	-1	0	3	0.80	2	-2	2	-2	2	-2	2	-1	2	0	2	-1	0.36	0	1	0	0	1.00
Trails and Walkways	575	1	1	1	4	2	1.80	0	2	0	0	2.00	0	2	0	0	0	0	2.00	0	0	0	0	0	0	1	0	2	0	0	0	1.50	4	4	2	0	3.33
Tree/Shrub Establishment	612	5	5	4	2	2	3.60	4	2	0	1	2.33	2	0	2	1	0	1	1.20	1	1	1	1	1	1	1	1	3	1	1	1	1.17	1	3	0	3	2.33
Tree/Shrub Site Preparation	490	-1	-1	-2	-1	0	-1.25	-2	-1	0	0	-1.50	0	0	0	0	0	2	2.00	-1	-1	0	0	0	0	0	0	-1	0	0	0	-0.50	0	0	0	0	0.00
Tree/Shrub Pruning	660	1	0	0	0	0	1.00	1	0	0	0	1.00	0	0	0	0	0	0	0.00	1	1	1	1	0	0	0	0	0	0	0	0	1.00	1	1	0	0	1.00
Underground Outlet	620	0	0	5	4	-1	2.67	0	0	0	0	0.00	0	4	0	0	0	0	4.00	-1	0	-1	0	0	0	-1	0	0	0	1	0	-0.50	0	0	0	0	0.00
Upland Wildlife Habitat Management	645	3	3	3	2	1	2.40	0	0	0	0	0.00	0	-3	2	0	0	0	-0.50	0	0	0	0	0	0	0	0	2	0	0	0	2.00	5	5	0	5	5.00
Vegetated Treatment Area	635	4	4	0	0	0	4.00	3	3	0	-2	1.33	-1	0	-2	0	0	0	-1.50	0	0	4	-2	2	-2	5	0	2	0	0	0	1.50	0	0	0	0	0.00
Vegetative Barrier	601	4	1	1	0	0	2.00	0	0	0	-2	-2.00	0	0	0	0	0	0	0.00	2	0	2	0	1	0	1	0	2	0	0	0	1.60	1	1	1	1	1.00

Vertical Drain	630	0	0	0	1	0	1.00	0	0	0	0	0.00	0	4	-2	0	0	0	1.00	0	-2	1	-2	1	-1	1	-1	1	0	1	-1	-0.20	0	0	0	0	0.00
Waste Facility Closure	368	0	0	0	0	0	0.00	0	0	0	2	2.00	0	0	0	0	0	0	0.00	0	0	2	2	0	1	0	2	0	0	0	0	1.75	0	0	0	0	0.00
Waste Recycling	633	0	0	0	0	0	0.00	1	0	0	0	1.00	0	0	0	0	1	1	1.00	0	0	2	2	2	2	0	2	0	0	0	0	1.43	0	0	0	0	0.00
Waste Separation Facility (no)	632	0	0	0	0	0	0.00	1	0	0	0	0.50	0	0	0	0	1	0	1.00	0	0	2	2	2	2	2	2	0	0	2	2	2.00	0	0	0	0	0.00
Waste Storage Facility	313	0	0	0	0	0	0.00	1	1	0	1	1.00	0	0	0	0	1	0	1.00	0	0	4	2	2	1	2	2	0	0	0	1	1.75	0	0	0	0	0.00
Waste Transfer	624	-1	-1	-1	0	0	-1.00	0	-1	0	0	-1.00	0	0	0	0	0	1	1.00	0	0	2	2	2	2	2	2	0	0	0	0	1.50	0	0	0	0	0.00
Waste Treatment	629	0	0	0	0	0	0.00	1	1	0	0	1.00	0	0	0	0	1	0	0.25	0	0	2	2	2	2	2	2	0	0	2	2	2.00	0	0	0	0	0.00
Waste Treatment Lagoon	359	0	0	0	0	0	0.00	1	1	0	0	1.00	0	0	0	0	1	0	0.50	0	0	4	2	2	1	4	2	0	0	0	1	2.00	0	0	0	0	0.00
Water and Sediment Control Basin	638	0	0	2	2	0	2.00	0	0	0	0	0.00	-2	2	-2	0	0	0	-0.67	0	-1	0	-1	0	-1	0	-1	4	-2	0	-1	-0.43	0	0	2	0	2.00
Water Harvesting Catchment	636	0	0	0	0	0	0.00	0	0	0	0	0.00	1	0	0	0	0	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	4	2	3.00
Watering Facility	614	2	2	2	1	4	2.20	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	0	4	0	1	0	2	1	2	1	1	0	1.71	0	0	5	3	4.00
Water Well	642	2	2	2	0	0	2.00	0	0	0	1	1.00	0	0	2	0	2	0	2.00	0	0	0	0	0	0	-1	0	0	0	0	0	-1.00	0	0	2	0	2.00
Waterspreading	640	0	0	0	-1	0	-1.00	1	0	0	1	1.00	0	1	-1	0	1	2	0.75	1	-1	2	-1	1	-1	0	-1	0	0	1	-1	0.00	2	2	1	0	1.67
Well Decommissioning	351	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0	0.00	0	2	0	2	0	2	0	2	0	0	0	2	2.00	0	0	0	0	0.00
Wetland Creation	658	0	0	0	0	0	0.00	2	0	0	0	2.00	0	2	-1	0	0	0	0.50	1	1	3	1	1	0	1	0	2	0	2	0	1.50	5	5	2	4	4.00
Wetland Enhancement	659	0	0	0	0	0	0.00	1	0	0	0	1.00	0	2	0	0	0	0	2.00	1	1	3	1	1	0	1	0	2	0	2	0	1.50	5	5	2	4	4.00
Wetland Restoration	657	0	0	0	0	0	0.00	1	0	0	0	1.00	0	2	0	0	0	0	2.00	1	1	3	1	1	0	1	0	2	0	2	0	1.50	5	5	2	4	4.00
Wetland Wildlife Habitat Management	644	0	0	0	0	0	0.00	0	0	0	0	0.00	0	2	0	0	0	0	2.00	0	0	0	0	0	0	1	0	3	0	0	0	2.00	5	5	2	4	4.00
Windbreak/Shelterbelt Establishment	380	1	5	2	0	0	2.67	4	2	0	1	2.33	2	0	2	5	5	3	2.83	3	0	1	1	0	0	0	0	1	0	1	0	1.40	3	3	0	3	3.00
Windbreak/Shelterbelt Renovation	650	1	5	2	0	0	2.67	4	2	0	1	2.33	2	0	2	5	5	3	2.83	3	0	1	1	0	0	0	0	1	0	1	0	1.40	3	3	0	3	3.00
Woody Residue Treatment	384	-1	1	1	1	0	1.00	-1	-2	0	0	-1.50	0	0	0	0	0	1	1.00	0	0	0	0	0	0	0	0	1	0	0	0	1.00	0	0	0	0	0.00

Attachment 2
Grant County Practice Toolbox with CPPE Averaged Function Scores

Grant County Conservation Practices

NRCS Code	Conservation Practice	Function Effects: Average CPPE Scores				Critical Areas					Agricultural Viability					
		Soil [1]	Hydrology	Water Quality	Habitat	WET	FFA	CARA	GHA	HCA	Soil Health	Prevent Soil Loss	Moisture Management	Weed/ Pest Management	Pollinator/ Beneficial Organisms	Yield/ Fertility Management
313	Waste Storage Facility	0.50	1.00	1.75	0.00	x	x		x	x				x		
327	Conservation Cover	2.77	1.25	2.89	3.33	x	x		x	x	x	x		x	x	
328	Conservation Crop Rotate	3.17	1.60	1.75	2.00	x			x	x	x	x	x	x	x	x
329	Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed	3.00	0.80	2.00	1.67	x	x	x	x	x	x	x	x			x
340	Cover Crop	2.46	1.40	1.75	2.00	x	x	x	x	x	x	x	x	x	x	x
345	Residue Management - Mulch Till	2.75	1.33	2.20	1.67	x	x	x	x	x	x	x	x			x
362	Diversion	0.75	1.40	0.71	0.00					x		x				x
382	Fence	1.00	0.00	2.00	0.00	x			x	x		x			x	
393	Filter Strip	2.50	0.00	2.36	2.00	x		x	x	x		x		x	x	
430	Irrigation Pipeline	1.00	1.33	0.89	0.00			x				x				x
441	Irrigation System, Microirrigation	0.25	2.00	1.33	1.00	x		x	x	x		x	x			x
442	Irrigation System, Sprinkler	1.25	2.67	1.55	1.00	x		x	x	x	x	x	x			x
449	Irrigation Water Management	1.75	1.50	1.82	0.00	x		x	x	x						
450	Anionic Polyacrylamide (PAM) Erosion Control	2.00	1.00	1.17	0.00				x			x				
472	Access Control	2.95	1.75	1.44	2.00	x		x	x	x	x	x		x	x	x
484	Mulching	2.50	0.60	0.83	1.00	x		x	x	x	x	x	x	x		x
490	Tree/Shrub Site Preparation	-1.38	2.00	-0.50	0.00	x		x	x	x				x	x	
500	Obstruction Removal	0.00	2.00	0.00	-2.00	x		x	x	x					x	x
511	Forest Harvest Management	1.50	1.00	1.25	1.00	x		x	x	x	x	x	x	x	x	
516	Livestock Pipeline	0.00	0.00	0.00	0.00			x	x	x						x
528	Prescribed Grazing	2.83	1.50	1.30	2.67	x	x	x	x	x		x				x
533	Pumping Plant	1.00	2.00	0.00	0.00		x					x		x		x
550	Range Planting	3.10	0.75	1.33	2.67				x	x	x	x		x	x	x
561	Heavy Use Area Protection	1.25	-1.00	1.67	0.00				x	x		x				
587	Structure for Water Control	0.00	2.00	1.00	2.00				x				x			
590	Nutrient Management	0.83	0.00	3.50	0.00			x		x	x					x
595	Pest Management	2.00	0.00	4.00	2.00			x		x	x			x	x	
606	Subsurface Drain	0.90	3.00	0.70	0.00				x	x		x	x			
612	Tree/Shrub Establishment	2.97	1.20	1.17	2.33	x				x		x			x	
614	Watering Facility	1.10	0.00	1.71	4.00					x						x
633	Waste Utilization	0.50	1.00	1.43	0.00					x			x			
634	Manure Transfer	-1.00	1.00	1.50	0.00					x			x			
642	Water Well	1.50	2.00	-1.00	2.00					x			x			x
643	Restoration and Management of Rare and Declining Habitats	0.50	0.00	2.00	4.00					x					x	
645	Upland Wildlife Habitat Management	1.20	-0.50	2.00	5.00					x				x	x	
734	Fish and Wildlife Structure	1.00	1.50	1.00	5.00					x				x	x	
325	Seasonal High Tunnel	0.50	0.00	0.00	0.00					x			x			

Notes:
1 = Soil function scores are based on the average scores for Soil Condition and Soil Erosion as summarized in Atttachment 1.
CARA = Critical Aquifer Recharge Areas
FFA = Frequently Flooded Areas
GHA = Geologically Hazardous Areas
HCA = Fish and Wildlife Habitat Conservation Areas
WET = Wetlands

Appendix D
Existing and Related Plans, Programs, and Regulations

APPENDIX D: Existing and Related Plans, Programs, and Regulations

Existing Conservation Programs

As described in the Voluntary Stewardship Program (VSP) Work Plan (Volume 2), the VSP provides a voluntary framework for critical areas protection and enhancement actions carried out by agricultural producers while maintaining and improving agricultural viability. Other similar programs are available to agricultural producers that are designed to incentivize protection and enhancement of critical areas through conservation practices. The availability of these programs is variable, as they are heavily influenced by the federal and state program funding, regulatory environment, industry standards, and the agricultural market. Many of these programs have been in place since the July 22, 2011 baseline and have contributed to conservation practices being implemented across the Grant County.

There are a variety of voluntary incentive programs for agricultural producers provided by federal, state, and local entities. The VSP was written to be compatible with existing conservation programs to achieve protection and enhancement of critical areas. Table 1 includes a summary of federal programs and Table 2 includes a summary of state and local programs available to agricultural producers. These tables provide a general representation of available federal, state, and local programs and are not intended to provide an exhaustive list.

The following list includes international organizations that offer a variety of voluntary conservation and certification programs to agricultural producers:

- **GLOBALG.A.P.:** GLOBALG.A.P. is an international non-profit organization that provides a voluntary GLOBALG.A.P. certification for eligible crops and livestock that meet or exceed 16 standards for safe and environmentally sound agricultural practices.
- **Safe Quality Food Institute (SQFI):** SQFI offers certifications recognized by the Global Food Safety Initiative for best agricultural and livestock practices.
- **PrimusLabs:** PrimusLabs, located in North and South America, is a food safety company that provides a Good Agricultural Practices (GAP) auditing program that certifies agricultural producers who comply with standard operating procedures for food safety.
- **Farmed Smart:** The Pacific Northwest Direct Seed Association oversees the Farmed Smart Program, which is designed to certify producers who use sustainable practices. The program defines conservation standards and provides educational tools to producers regarding the environmental benefits of direct seeding.

Table 1
Federal Conservation Programs

Lead	Description	Program	Details
Natural Resources Conservation Service (NRCS)	NRCS provides technical and financial assistance to help agricultural producers make and maintain conservation improvements on their land. NRCS also offers conservation easement programs and partnerships to leverage existing conservation efforts on farm lands.	**Environmental Quality Incentives Program (EQIP)**[1]	Voluntary program providing financial and technical assistance for agricultural producers to plan and implement conservation practices improving soil, water, plant, animal, air, and related natural resources.
		Conservation Stewardship Program (CSP)[2]	Voluntary program providing technical assistance for agricultural and forest landowners to develop plans for conservation, management, and enhancement activities.
		Agricultural Conservation Easement Program (ACEP)[3]	Provides conservation partners with financial and technical assistance through agricultural land easements to restore, protect, and enhance wetlands.
		Agricultural Water Enhancement Program (AWEP)[4]	Voluntary program providing financial and technical assistance to agricultural producers for implementing agricultural water-enhancement activities.
		Wildlife Habitat Incentive Program (WHIP)[5]	Voluntary program for wildlife habitat conservation and enhancement on agricultural land, nonindustrial private forest land, and Native American land.
Farm Service Agency (FSA)	FSA oversees several voluntary, conservation-related programs that work to address several agriculture-related conservation measures.	**Conservation Reserve Program (CRP)**[6]	Voluntary reserve program to conserve environmentally sensitive land through agricultural protections and plant species to improve environmental health.
		Conservation Reserve Enhancement Program (CREP)[7]	Similar to the CRP, this voluntary program targets high-priority conservation issues. The contract period is typically 10 to 15 years.

[1] www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/
[2] www.nrcs.usda.gov/csp
[3] www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/
[4] www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/whip/
[5] www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/awep/
[6] www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/
[7] www.fsa.usda.gov/FSA/webapp?area=home&subject=lown&topic=cep

Table 2
State and Local Conservation Programs

Lead	Description	Program(s)	Details
Washington State Conservation Commission (WSCC)	WSCC works with conservation districts (CDs) to provide voluntary, incentive-based programs for implementation of conservation practices. WSCC supports the CDs through financial and technical assistance; administrative and operational oversight; program coordination; and promotion of CDs activities and services.	**Coordinated Resource Management (CRM) Program**[8]	Voluntary and locally led program for landowners seeking to resolve land-use and natural resource issues through local coalitions and consensus building.
		Irrigation Efficiencies Grant Program (IEGP)[9]	Provides financial incentives to landowners willing to install irrigation systems that save water.
		Natural Resource Investments (non-shellfish) Grants[10]	Grant program for landowners to complete natural resource enhancement projects necessary to improve water quality in non-shellfish growing areas.
		Office of Farmland Preservation (OFP)[11]	The OFP identifies and addresses farmland loss through agriculture conservation easement programs, providing technical assistance, developing farm transition programs, and providing data and analysis on trends.
Washington State Department of Fish and Wildlife (WDFW)	WDFW provides financial assistance for habitat projects that restore and/or preserve fish and wildlife habitat through funding opportunities such as the ALEA Volunteer Cooperative Grant Program.	**Aquatic Lands Enhancement Account (ALEA)**[12]	Grant program for qualifying landowners who undertake projects that benefit Washington state's fish and wildlife resources.
		Partnership for Pheasants[13]	Voluntary habitat enhancement and public access program that provides annual rental payments to landowners who plant and maintain pheasant habitat and allow public hunting.

[8] http://scc.wa.gov/coordinated-resource-management/
[9] http://scc.wa.gov/iegp/
[10] http://scc.wa.gov/wq-nonshellfish/
[11] http://scc.wa.gov/office-of-farmland-preservation/
[12] http://wdfw.wa.gov/grants/alea/index.html
[13] http://wdfw.wa.gov/grants/pheasants/index.html

Lead	Description	Program(s)	Details
Washington State Recreation and Conservation Office	The Washington State Recreation and Conservation Office provides funding to protect aquatic lands and for projects aimed at achieving overall salmon recovery, including habitat projects and other activities that result in sustainable and measurable benefits for salmon and other fish species. Funding is provided through programs such as ALEA and the Salmon Recovery Funding Board Grant Program.	**Aquatic Lands Enhancement Account (ALEA)**[14]	Local and state agencies and Native American Tribes can apply for grants to fund aquatic habitat-enhancement projects.
		Salmon Recovery Funding Board Salmon Recovery Grants[15]	Grant program for eligible parties seeking to improve important habitat conditions or watershed processes to benefit salmon and bull trout.
		Farmland Preservation Grants[16]	Grant program for local agencies and non-profits to buy development rights on farmlands to ensure the lands remain available for farming in the future.
Washington State Department of Ecology (Ecology)	Ecology provides funding for water-quality improvement and protection projects, including programs such as the Water Quality Financial Assistance program and voluntary partnership programs such as the Farmed Smart Partnership.	**Water Quality Financial Assistance Program**[17]	Grant and loan program for high-priority projects to protect and improve the health of Washington State waters.
		Farmed Smart Partnership[18]	Regional voluntary program overseen by the Pacific Northwest Direct Seed Association, in coordination with Ecology, that certifies agricultural producers for environmentally friendly and sustainable dryland agriculture practices.

[14] http://www.rco.wa.gov/grants/alea.shtml
[15] http://www.rco.wa.gov/grants/sal_rec_grants.shtml
[16] http://www.rco.wa.gov/grants/farmland.shtml
[17] http://www.ecy.wa.gov/programs/wq/funding/funding.html
[18] http://www.ecy.wa.gov/programs/wq/nonpoint/Agriculture/farmedsmart.html

Lead	Description	Program(s)	Details
Grant County Conservation Districts (GCCD)	GCCD works through voluntary, incentive-based programs to assist landowners and agricultural operators with the conservation of natural resources including cost-share, and assistance in the development of range management and farm conservation plans.	**Cost-share Assistance Programs**[19]	Program providing technical assistance and cost-share assistance for projects that implement best management practices to address natural resources priority areas, livestock management, small farms, vacant lot weed control, and wildlife conservation.
		Irrigation Water Management Cost-share[20]	Program providing cost-share assistance for farmers to install and utilize water management technology in coordination with the Grant Public Utility District.
Washington State University (WSU) Extension	The WSU Extension program connects agricultural and natural resource stakeholders and industries, as well as the general public, to extend research-based information and conduct locally relevant applied research in the fields of agriculture and natural resource sciences.	**Agriculture and Natural Resources Program**[21]	Program providing technical assistance, research, and education to producers.

[19] http://www.columbiabasincds.org/projects
[20] http://www.columbiabasincds.org/project-page
[21] http://anr.cw.wsu.edu/

Related Plans and Programs

As required by RCW 36.70A.720(1)(a), the VSP Work Plan must incorporate applicable water quality, watershed management, farmland protection, and species recovery data and plans. Table 3 includes a summary of the planning documents and programs that were referenced for the VSP Work Plan and appendices. This includes watershed management and wildlife management programs prepared specific to Grant County and the Columbia Basin.

The County includes portions of six watersheds, or Water Resource Inventory Areas (WRIAs). As described in the VSP Work Plan, the watershed that overlaps with most of the County is the Lower Crab (WRIA 41). The southern portion of the County is in the Esquatzel Coulee (WRIA 36). The northern portion of the County is largely in the Grand Coulee (WRIA 42), with portions in the Upper Crab-Wilson (WRIA 43), Moses Coulee (WRIA 44), and Lower Lake Roosevelt (WRIA 53).

Within the six watersheds, there are two Washington State Department of Ecology water quality improvement projects or Total Maximum Daily Loads (TMDLs) in process or under development:[22]

- Upper Crab Creek: TMDL is currently on hold due to a study confirming that a surface water connection between Lake Audubon and Upper Crab Creek was highly unlikely or a rare event.
- Moses Lake: TMDL is under development for Nitrogen and Total Phosphorus.

Table 3
Summary of Planning Documents

Plan or Program	Date	Author/Agency	Description
State and Local Management Plans and Programs			
Grant County Hazard Management Plan	December 2013	Grant County	The Hazard Management Plan identifies hazards and vulnerable areas within the County, including erosion, flood-hazard, and landslide-prone areas.
Grant County Shoreline Master Program (SMP) and Restoration Plan	September 2014	Grant County	The SMP includes shoreline goals and policies for management and protection of shorelines of the state located within the County. The Restoration Plan describes existing restoration planning, programs, and partners and summarizes goals and priorities for the County.
Crab Creek Subbasin Plan	May 2004	Washington Department of Fish and Wildlife and Lincoln County Conservation District	The Crab Creek Subbasin Plan consists of a comprehensive description of the basin general ecology including the identification of specific fish and wildlife needs. Future action strategies and project funding are to be based upon these identified needs.

[22] http://www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyCounty/grant.html

Plan or Program	Date	Author/Agency	Description
State and Local Management Plans and Programs			
Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan	August 2007	Upper Columbia Salmon Recovery Board	The recovery plan includes recommendations for several enhancement and implementation measures to restore and protect habitat throughout the upper Columbia Basin, including Crab Creek.
Various Groundwater Management Area Plans and Reports	*Various*	Columbia Basin Groundwater Management Area	Groundwater Management Area plans and reports describe existing conditions and management recommendations for municipalities located throughout the Columbia Basin. Management practices include irrigation water management used to reduce irrigation infiltration and entrained nitrate.
Shrub-steppe and Grassland Restoration Manual for the Columbia River Basin	2011	Washington State Department of Fish and Wildlife	This publication provides guidance for shrub-steppe and grassland restoration practitioners within the Columbia River Basin.
Management Recommendations for Washington's Priority Habitats: Riparian	1997	Washington State Department of Fish and Wildlife	The riparian habitat management plan provides statewide riparian management recommendations based on the best-available science.
Washington State Recovery Plan for the Greater Sage Grouse	May 2004	Washington State Department of Fish and Wildlife	The greater sage grouse recovery plan prescribes strategies to recover the species such as protecting and restoring habitat.

Federal, State, and Local Regulations that Apply to Agriculture

The VSP is provided as an alternative to protecting critical areas used for agricultural activities through development regulations under the Growth Management Act. Despite its voluntary nature, it is still the intent of the VSP to improve, and not limit, "compliance with other laws designed to protect water quality and fish habitat," per Revised Code of Washington (RCW) 36.70A.700 and 36.70A.702. Per RCW 36.70A.720, the development regulations used to achieve the goals and measurable benchmarks for protection of critical areas must be incorporated into the VSP Work Plan.

Tables 4 and 5 include a summary of federal, state, and local development regulations that are used to achieve the goals and measurable benchmarks of the VSP Work Plan. This list includes the most common environmental regulations affecting agriculture. The list does not include all regulations potentially impacting agricultural producers in the County. For instance, regulations on taxation, employment practices, marijuana production, and other regulations are not included. Because no regulations are enforced via the VSP, regulatory enforcement in the County provides a "regulatory backstop." For example, the Washington State Department of Ecology will continue to regulate wetland conversions on agricultural lands through the local Water Pollution Control Act.[23] Continued compliance with these regulations provides assurance the functions and values of critical areas are protected.

As illustrated in Figure 1, the VSP is intended to balance critical areas protection and agricultural viability at the County level through voluntary actions by agricultural producers. VSP is not a replacement for compliance with other laws and regulations, but participation in the program can often help agricultural producers comply with these requirements.

[23] Washington State Department of Ecology, 2013. The Voluntary Stewardship Program and Clean Water. Available at: https://fortress.wa.gov/ecy/publications/publications/1310030.pdf.

Figure 1
Balanced Approach of Critical Areas Protection and Agricultural Viability

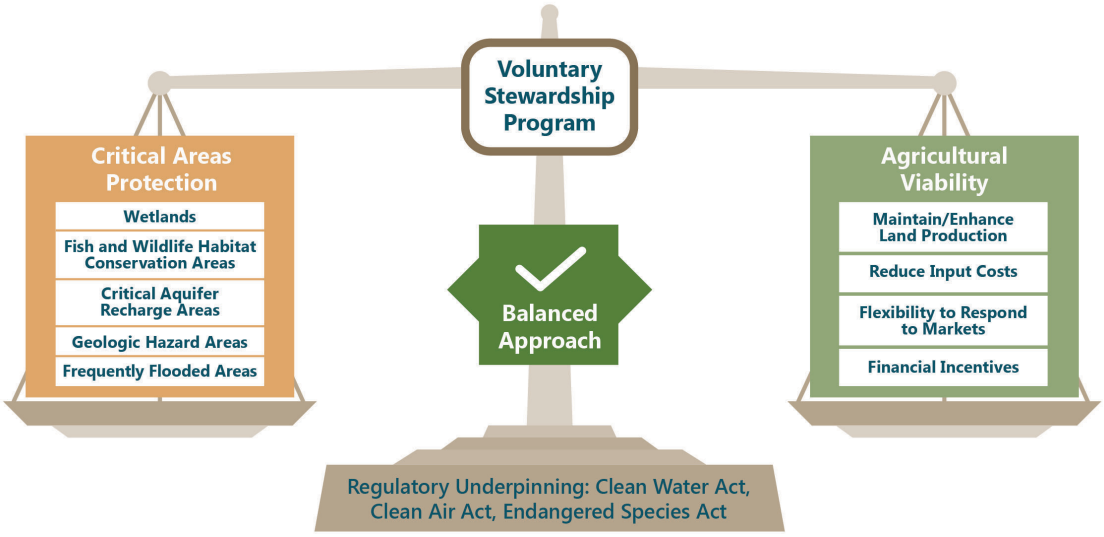


Table 4
Federal Regulations that Apply to Agriculture

Regulation(s)	Agency	Description	VSP Intersect
Agricultural Act (Farm Bill)[24]	U.S. Department of Agriculture	The Farm Bill, reauthorized in 2014, eliminates direct payments and continues crop insurance.	The Farm Bill includes the "swampbuster" conservation policy prohibiting land owners from converting wetlands to cropland. The "sodbuster" provision requires participating parties to maintain a specified level of conservation.
Clean Water Act (CWA)[25]	U.S. Environmental Protection Agency (USEPA); regulated locally by Washington State Department of Ecology	The CWA regulates discharges of pollutants into waters of the United States, including discharges of dredge or fill material in wetlands. CWA exemptions for agriculture are designed consistent with and support existing U.S. Department of Agriculture programs.	Compliance with the CWA maintains or enhances water quality, which in turn benefits critical areas, including wetlands and fish and wildlife habitat conservation areas.
Safe Drinking Water Act (SDWA)[26]		The SDWA protects public drinking water supplies in the United States, including sole-source aquifers. The USEPA provides technical and financial resources under the Clean Water State Revolving Fund (CWSRF) for improving water quality, protecting drinking water sources, and controlling nonpoint source pollution.	The SDWA is designed to protect critical aquifer recharge areas, an important source for drinking water that is vulnerable to contamination.
National Pollution Discharge Elimination System (NPDES)[27]		NPDES is promulgated under the CWA to regulate discharges to waters of the United States from animal feeding operations.	Regulated discharges to waters of the United States helps to protect water quality in critical areas, including wetlands and fish and wildlife habitat conservation areas.

[24] https://www.fsa.usda.gov/programs-and-services/farm-bill/index
[25] https://www.epa.gov/laws-regulations/summary-clean-water-act
[26] https://www.epa.gov/sdwa
[27] https://www.epa.gov/npdes

Regulation(s)	Agency	Description	VSP Intersect
Endangered Species Act (ESA)[28][29]	National Marine Fisheries Service and the U.S. Fish and Wildlife Service	The ESA protects threatened and endangered species and critical habitat throughout the United States.	ESA-listed species and critical habitat are protected through avoidance and minimization measures such as the "no-spray" pesticide buffer zones near ESA-listed salmon-bearing waterbodies. The no-spray buffer zones are 60 feet for ground and 300 feet for aerial pesticide applications.
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)[30]	U.S. Environmental Protection Agency	FIFRA regulates pesticide distribution, sale, and use and includes labeling and registration requirements.	Compliance with FIFRA is intended to maintain or enhance water quality, which in turn benefits critical areas, including wetlands, fish and wildlife habitat conservation areas, and critical aquifer recharge areas.
National Emissions Standards for Hazardous Air Pollutants (NESHAP)[31]	U.S. Environmental Protection Agency	NESHAP regulates hazardous air pollutant emissions, including from new and existing facilities that manufacture organic pesticide active ingredients used in herbicides, insecticides, and fungicides.	These regulations are intended to reduce or eliminate hazardous air pollutant emissions with the potential to spread via aerial application to critical areas, including wetlands and fish and wildlife habitat conservation areas.

[28] http://www.nmfs.noaa.gov/pr/laws/esa/
[29] https://www.fws.gov/endangered/
[30] https://www.epa.gov/laws-regulations/summary-federal-insecticide-fungicide-and-rodenticide-act
[31] https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-9

Table 5
State and Local Regulations that Apply to Agriculture

Regulation(s)	Agency	Description	VSP Intersect
Revised Code of Washington (RCW)			
Title 15 Agriculture and Marketing	Washington State Department of Agriculture	RCW Title 15 includes general regulations pertaining to agricultural practices.	• Regulations cover pest and disease control, fertilizers, and commodity commissions
Title 16 Animals and Livestock	Washington State Department of Agriculture	RCW Title 16 includes general regulations pertaining to animals and livestock practices.	• Regulations cover range areas, meat licensing, feed lot certification, and fencing.
Title 17 Weeds, Rodents, and Pests	Washington State Noxious Weed Control Board*	RCW Title 17 includes general regulations pertaining to weed, rodent, and pest control.	• RCW Title 17.06 establishes intercounty weed districts.
Title 36 Counties	*Various*	RCW Title 36 includes regulations pertaining to counties including the Voluntary Stewardship Program.	• RCW Titles 36.70A.700-904 comprise the Voluntary Stewardship Program, a program designed to promote plans to protect and enhance critical areas while maintaining and improving agricultural viability.
Title 77 Fish and Wildlife	Washington Department of Fish and Wildlife	RCW Title 77 includes fish and wildlife enforcement regulations.	• Salmon recovery and enhancement programs include habitat projects and plans, including voluntary, incentive-based enhancement programs. • In-water construction activities (i.e., hydraulic projects) are regulated under RCW Title 77.55.
Title 87 Irrigation	Irrigation Districts	RCW Title 87 regulates irrigation and irrigation districts.	• RCW Title 87.03 establishes irrigation and improvement districts.
Title 89 Reclamation, Soil Conservation, and Land Settlement	Conservation Districts, Office of Farmland Preservation, and Irrigation Districts	RCW includes general regulations pertaining to reclamation and local conservation districts.	• RCW Title 89.08 establishes conservation districts • RCW Title 89.10 establishes the Office of Farmland Preservation • RCW Title 89.12 includes adoption of the Columbia Basin Project Act and related regulations.

Regulation(s)	Agency	Description	VSP Intersect
Title 90 Water Rights – Environment	*Various*	RCW Title 90 regulates various aspects of water rights and appropriation for public and industrial purposes.	• RCW Title 90.42-46 include regulations pertaining to water resource management, regulation of public groundwater, and reclaimed water use. • RCW Title 90.48 includes the Water Pollution Control Act which regulates agricultural discharges to surface waters and wetlands. • RCW Title 90.64 includes dairy nutrient management regulations. • RCW Title 90.90 includes the Columbia River Basin water supply rules for allocation and development of water supplies.
Washington Administrative Code (WAC)			
Title 16	Washington State Department of Agriculture	WAC Title 16 includes Washington State Department of Agriculture rules pertaining to agriculture regulation, certification, and marketing.	• WAC Chapters 16-200 through 16-202 include standards for fertilizer and pesticide usage. • WAC Chapter 16-611 includes standards for nutrient management.
Title 173	Washington State Department of Ecology	WAC Title 173 includes Washington State Department of Ecology rules for air and water quality protection.	• WAC Chapters 173-15 through 173-27 include state Shoreline Management Act rules and permitting requirements. The County currently implements the Shoreline Master Program under these state rules. • WAC Chapter 173-134A sets the Quincy groundwater management and zones. • WAC Chapter 173-158 includes floodplain management rules. • WAC Chapters 173-166, 173-170, and 173-173 includes rules for drought relief programs, agricultural water supply facilities, and measuring and reporting water usage. • WAC Chapter 173-220 includes National Pollution Discharge Elimination System rules for discharges to waters of the state. • WAC Chapter 173-430 includes rules for agricultural burning.

Regulation(s)	Agency	Description	VSP Intersect
Title 220 and 232	Washington State Department of Fish and Wildlife	WAC Title 173 includes Washington State Department of Fish and Wildlife rules for management of fish and wildlife species and habitat.	• WAC Chapter 220-410 defines game management areas, including the Game Management Units in Grant County. • WAC Chapter 220-620 describes the volunteer cooperative fish and wildlife enhancement program. • WAC Chapter 220-660 includes the Washington State Hydraulic Code which regulates in-water construction activities (hydraulic projects) through Hydraulic Project Approvals. • WAC Chapter 232-28 includes wildlife interaction rules, including those pertaining to damage of commercial crops and livestock.
Title 246	Washington State Department of Health	WAC Title 246 includes Washington State Department of Health rules, including those for protection of water systems.	• WAC Chapters 246-290 and 246-291 includes rules for Group A and B public water supplies and water systems, respectively. These include regulations for using greywater for irrigation purposes.
Grant County Regulations			
Critical Areas Ordinance	Grant County Planning Department	The Grant County Critical Areas and Cultural Resources Code is promulgated under Grant County Code (GCC) 24.08.	• GCC 24.08.060 permits existing and ongoing agricultural operations without county review occurring within critical areas and their buffers. However, agricultural practices with significant impacts to critical areas are not exempt from this chapter. New development and/or expansion of existing developments must comply with this chapter. • GCC 24.08.430 includes protection standards for critical areas. GCC 234.08.430(e) requires agricultural uses to employ best management practices in the application, storage, and disposal of pesticides, herbicides, sterilants, fumigants, and fertilizers, including livestock wastes.

Regulation(s)	Agency	Description	VSP Intersect
Shoreline Master Program	Grant County Planning Department	The Grant County Shoreline Master Program is promulgated under GCC 24.12	• GCC 24.12.030(b)(17) includes policies protecting agricultural land of long-term significance from development, protecting the productivity of land through best management practices for soil erosion, and maintaining a vegetative buffer between agricultural land and water bodies or wetlands. • The Shoreline Master Program covers new or additional uses within shorelines of the state (defined as 200 feet from mean higher high water) and does not limit or modify existing or ongoing agricultural practices. The VSP applies to critical areas both inside and outside of the shoreline jurisdiction.
Flood Damage Prevention	Grant County Planning Department	The Grant County Flood Damage Prevention ordinance is promulgated under GCC 24.16	• The Flood Damage Prevention ordinance is intended to reduce flood damages from development within flood hazard areas.

*Includes agencies responsible for overseeing agriculture-specific regulations. Other agencies may be assigned jurisdiction for non-agriculture related regulations described therein.

Appendix E
Grant County VSP Outreach Plan

GRANT COUNTY VOLUNTEER STEWARDSHIP PROGRAM
OUTREACH PLAN

OBJECTIVE:	Ensure outreach is provided to the agricultural community and all parties with interest in or potentially impacted by the Voluntary Stewardship Program

Your Goal	Next Steps/Resources	Who	When	Progress Report
DEVELOP VSP COMMUNICATIONS PLAN	▸ Workgroup meeting notices	Marie Lotz	1 week before meeting	Agenda/Minutes and packet information sent to list 1 week prior to scheduled meeting. Legal notices sent in local newspaper 2 weeks prior to each meeting. GCCD website lists all meetings.
	▸ FSA Newsletter ▸ WSU Newsletter	Crose Lotz	10/14/16 10/6/16	Published Community Dates and information about VSP Published Community dates and information about VSP
	▸ Newspaper articles		5/23/16 8/8/16	Introduction VSP and let us come speak to your board. Why you need to be involved in process
	▸ GCCD Newsletter	Marie Lotz	April 2016 Aug 2016 Sept 2016 May 2017	VSP information in newsletter with future articles to be added. VSP process and importance to be involved VSP information newsletter. VSP information newsletter.
	▸ Paid advertisement Community meetings	Marie Lotz	10/3/16 10/11/16	All Community Meetings advertised Posters in each community (8) various locations about meetings.
	▸ GCCD Website	Marie Lotz	4/1/16	VSP information on website and meeting dates being updated as needed.
	▸ Postcards	Marie Lotz	9/13/16 10/12/16	Upcoming Community Meetings announced Community meetings date, place, time
DEVELOP OUTREACH MATERIALS	▸ Develop VSP Fact Sheet	Crose/Lotz	April 2016	VSP Fact sheet produced and updated as needed.
	▸ PowerPoint presentation Community Group meetings	Crose/Lotz/Anchor	Ongoing	Hartline – 10/27/16; Ephrata – 11/1/16; Moses Lake – 11/3/16 Royal Slope – 11/10/16; Warden – 11/15/16; Mattawa – 11/17/16
	▸ News Articles	Crose/Lotz Crose/Lotz	9/23/16 9/22/16	Columbia Basin Herald IFiber News
	▸ Newsletter VSP	Lotz/Crose	10/5/16 11/2/16 5/30/16	Grant County VSP Newsletter Grant County VSP Newsletter Grant County VSP Newsletter
	▸ News Reporters	Lotz/Crose	9/9/16 9/14/16	Columbia Basin Herald Reporter IFiber News Reporter
DEVELOP CONTACT LISTS	▸ Farmers and Ranchers	Crose/Lotz	May 2016	200 agriculture producers mailing addresses. Add to when new producers request to be added.
	▸ Ag organizations	Crose/Lotz	May 2016	Identified with name and manager and address.

GRANT COUNTY VOLUNTEER STEWARDSHIP PROGRAM OUTREACH PLAN				
	► Public	Crose/Lotz	8/15/16	Lynn Olsen, Adams Co. VSP process, what is VSP, etc.
	► Food processors	Crose/Lotz	May 2016	Identified with name and manager and address.
	► Ag tech support group	Crose/Lotz	May 2016	Identified with name and manager and address.
	► Federal, state and local government	Crose/Lotz	May 2016	Identified with name and lead and address.
	► Tribes	Crose/Lotz	May 2016	Identified Colville, Yakama, Spokane, Wanapum with name and address.
	► Environmental Groups	Crose/Lotz	May 2016	Identified with name and address.
COMMUNITY MEETINGS	► Hartline	Lotz, Crose	10/27/16 1-3 PM	Catholic Church Hall, 138 Range St, Hartline, WA 99135 10 attendees
	► Ephrata	Lotz, Crose	11/1/16 1-3 PM	Grant County Public Works, 124 Enterprise ST SE, Ephrata 98823 8 attendees
	► Quincy	Lotz, Crose	11/7/16 1-3 PM	Port Quincy, 115 F ST SW, Quincy 98848 6 attendees
	► Moses Lake	Lotz, Crose	11/3/16 1-3 PM	WA Potato Commission, 108 S Interlake, Moses Lake 98837 3 attendees
	► Warden	Lotz, Crose	11/15/16 1-3 PM	Senior Center, 114 N Oak, Warden 98857 9 attendees
	► Black Sands	Lotz, Crose	Can attend any	
	► Royal City	Lotz, Crose	11/10/16 1-3 PM	Royal City Golf Course, 13702 Dodson Rd, Royal City 99357 9 attendees
	► Mattawa	Lotz, Crose	11/17/16 1-3 PM	Mattawa Community Center, 200 Portage AVE, Behind 76 Gas Station, Mattawa 99349 4 attendees
GOVERNMENT	► Department of Natural Resources (DNR)			
	► WA Department of Fish & Wildlife	Crose/Lotz Crose/Lotz	5/18/16 7/27/16	Met with Pentico/Andonaegui about Critical Areas/wildlife plan here Met with Pentico/Andonaegui/ Matt Monda about wildlife BMP's in Ephrata
	► WSU Adams/Grant Extension	Lotz	6/22/16	Discussion on VSP participation.
	► Department of Ecology (DOE)	Crose/Lotz	7/14/16	Meeting with Zach Meyer and Gary Graff in Yakima.
	► Farm Service Agency (FSA)	Crose	9/29/16	Meeting with Greg Anderson

GRANT COUNTY VOLUNTEER STEWARDSHIP PROGRAM
OUTREACH PLAN

	▸ Natural Resource Conservation Service (NRCS)	Crose/Lotz	5/23/16	Meeting about VSP with Erin Kaczmarczyk
	▸ Grant County Commissioners		8/2/16 2/7/17 3/7/17 6/6/17	Overview of VSP process and plan in Ephrata Update on VSP process Update on VSP process Update on VSP process
	▸ Grant County Planner	Crose/Lotz	6/1/16 8/2/16	Met with Damien progress of VSP beginning stages Met with Damien on VSP progress/direction.
	▸ VSP Statewide Advisory Committee		8/31/16	Present Grant Co. VSP Plan and process in Lacy
	▸ VSP Technical Panel	Crose/Lotz/Anchor Crose/Lotz/Anchor Crose/Anchor Crose/Lotz/Anchor	8/31/16 5/26/17 6/10/17 6/20/17	Present Grant Co. VSP Plan and process in Lacy. Submitted Grant County Plan to State Technical Panel via website. Present to answer questions on plan submitted by Grant County VSP on 5/26/17 in Lacy. Present to answer final questions on plan in Lacy – Plan approved by Tech Panel
	▸ Dept of Agriculture	Crose Lotz	7/16 9/15/16	Perry Beale provided cropping data. Met with Derek Sandison, Director, GCCD office VSP process.
	▸ WA State Conservation Commission	Crose/Lotz Crose/Lotz	8/19/16 8/30/16	Mike Baden went over VSP and he made maps for communities with cropping. Mark Clark and NRCS met to go over VSP process in Ellensburg.
	▸ Grant County Health	Lotz	7/26/16	Request all nitrate levels over 10ppm, received not that many over the limit or many wells tested.
	▸ Direct Seed Association	Lotz/Crose	8/16/16	Met with board to go over Farmed Smart in Irrigated Agriculture.
	▸ NRCS and WSCC	Lotz/Crose	8/30/16	Met with NRCS staff and WSCC staff/Clark, Ledgerwood on Grant County approach.
	▸ VSP Regional Meeting	Crose/Lotz	1/24/17	Presentation Outreach/Education and Available Incentive Programs
FOOD PROCESSORS	▸ Lamb Weston	Crose/Lotz Crose/Lotz	6/22/16 10/10/16	Invite letter sent to all listed to meet about details of VSP. Brandon Mauseth - Lamb Weston Quincy VSP details GCCD office.
	▸ Basic American Foods	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	▸ Central Bean	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	▸ ConAgra	Crose/Lotz Lotz	6/22/16 7/15/16	Invite letter sent to all listed to meet about details of VSP. Marvin Price, Lamb Weston, requested to be added to e-mail list after discussion about VSP process and participation.
	▸ J.R. Simplot	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.

GRANT COUNTY VOLUNTEER STEWARDSHIP PROGRAM OUTREACH PLAN				
	► National Frozen Foods Quincy	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Royal Ridge Fruit	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Washington Potato	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Skone & Conners	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Jones Produce	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Jerry Milbrandt	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Pacific Coast Canola	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► National Frozen Foods Moses Lake	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
AG TECH SUPPORT	► Field Men Association			
	► Fertilizer companies			
	► IWM Consultants	Lotz	6/2/16	IWM consultant Anderson about data information on number of acres implemented.
	► Ag equipment dealers	Crose/Lotz	9/26/16	WA Tractor – VSP involvement and demonstration field days along with Drones.
ANNUAL MEETINGS	► Grant County Weed	Lotz	January 1/14/16	Presentation on VSP
	► Columbia Basin Crop		January	Presentation
	► Columbia Hay Growers	Crose/Lotz	February 2/17/16	Presentation about VSP
	► Grant County Conservation District		TBA	
	► Cenex Annual Meeting	Lotz/Crose	11/18/16	Char, 208-949-9983 15 Minutes, 8:50-9:05 AM
	► Vegetable Seed Growers	Crose/Lotz Crose/Lotz	January 1/22/16 2/1/16	Presentation VSP accepted by Grant County Presentation VSP progress
	► Wilbur Ellis	Crose/Lotz	2/7/16	Presentation VSP information and progress

GRANT COUNTY VOLUNTEER STEWARDSHIP PROGRAM OUTREACH PLAN

Your Goal	Next Steps/Resources	Who	When	Progress Report
DISTRICTS and COUNCILS	► Grant County Public Utility District	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► WA Potato Commission	Crose/Lotz Crose/Lotz	6/22/16 4/1/16	Invite letter sent to all listed to meet about details of VSP. Met with Matt Harris about participation in VSP, Work Group member.
	► Columbia Basin Development League	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Grant County Economic Development Council	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► East Columbia Basin Irrigation District	Crose/Lotz	8/15/16	Met with Craig Simpson irrigation district role and how they can help get word out, Work Group member.
	► Quincy Irrigation District	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Black Sands Irrigation District	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Moses Lake Irrigation District	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Bureau of Reclamation	Crose/Lotz	6/22/16	Invite letter sent to all listed to meet about details of VSP.
	► Grant County Public Works Dept	Crose	10/11/16	Met with Elizabeth and Damien regarding maps needed for VSP. Elizabeth provided maps.
OTHERS	► US Fish & Wildlife			
	► Representative Dent	Crose/Lotz	5/23/16	Discussed VSP and the need to fund it in the future for implementation.
	► Senator Warnick	Crose/Lotz	5/23/16	Discussed VSP and the need to fund it in the future for implementation.
	► Senate Ag Committee	Crose/Lotz	9/26/16	Drone demonstration and VSP information/update/importance to support
	► 12th District	Crose/Lotz	12/12/16	Condotta, Hawkins, Steele VSP support and information
	► 9th and 13th Legislative Districts	Crose/Lotz/Dan Dormaier	2/14/17	Legislative Days – VSP Support

GRANT COUNTY VOLUNTEER STEWARDSHIP PROGRAM OUTREACH PLAN

Your Goal	Next Steps/Resources	Who	When	Progress Report
Work Group	► Work Group Meeting	Crose/Lotz/Anchor	4/26/16 4-6 PM 16 attended	Invite Meeting, Overview, roundtable discussions, establishing By-laws, timelines, work plan development
	► Work Group Meeting	Crose/Lotz/Anchor	6/27/16 7-9 PM 15 attended	View WA Open Public Meetings Act Video, follow up action items, key terms and requirements, baseline discussions, work plan development, project schedule
	► Work Group Meeting	Crose/Lotz/Anchor	9/26/16 7-9 PM 12 attended	Recap, summer activities, baseline ag practices, conservation measures by community, ag type, questions/concerns roundtable, workplan outline review
	► Work Group Meeting	Crose/Lotz/Anchor	10/24/16 3:30-5:30 11 attended	Recap prior meeting, upcoming public meetings, critical areas functions and values
	► Work Group Meeting	Crose/Lotz/Anchor	12/5/16 1-3 PM 20 attended	Follow up, recap, debrief from public outreach meetings, conceptual overview of work plan volume 1, case study on Grant County farm, roundtable
	► Work Group Meeting	Crose/Lotz/Anchor	1/23/17 1-3 PM 18 attended	Work Plan objectives, work plan overview, Volume 1 Work Plan content review, discuss layout, next steps
	► Work Group Meeting	Crose/Lotz/Anchor	2/27/17 2-4 PM 18 attended	Review comments received, goals & benchmarks methods, implementation phase, plan framework, next steps
	► Work Group Meeting	Crose/Lotz/Anchor	4/17/17 3-5 PM 12 attended	Updates/recap last meeting, outreach materials, VSP overview, VSP checklist, review revised work plan, protection & enhancement benchmark value, next steps
	► Work Group Meeting	Crose/Lotz/Anchor	5/22/17 6-8 PM 11 attended	Work plan objective, work plan overview, volume 1, work plan content review, discuss layout, plan approval and submittal process, next steps
Work Group Formed April 26, 2016	► Environmental Groups	Crose/Lotz	4/8/16	Central Basin Audubon, Ducks Unlimited, Walleye Club, Pheasants 4ever, Nature Conservancy invite letter.
	► Grant Co. Planning Dept.	Crose/Lotz	4/8/16	Damien Hooper sent invite letter.
	► WA State Potato Commission	Crose/Lotz	4/8/16	Chris Voigt sent letter.
	► Natural Resources Conservation	Crose/Lotz	4/8/16	Erin Kaczmarczyk letter sent.
	► WSU Extension/Horticulture	Crose/Lotz	4/8/16	Andy McGuire letter sent.

	▸ Confederated Tribes of the Yakama Nation	Crose/Lotz	4/8/16	JoDe L. Goudy – Toppenish letter sent.
	▸ Confederated Tribes of the Colville Reservation	Crose/Lotz	4/8/16	Guy Moura – Nespelem letter sent.
	▸ Spokane Tribe	Crose/Lotz	4/8/16	Rudy Peone – Wellpinit letter sent.
	▸ Wanapum Tribe	Crose/Lotz	4/8/16	Rex Buck Jr. – Beverly letter sent.
	▸ Department of Ecology	Crose/Lotz	4/8/16	Spokane office sent letter.
	▸ Department of Natural Resources	Crose/Lotz	4/8/16	Ellensburg office sent letter.
	▸ Grant County Farm Bureau	Crose/Lotz	4/8/16	Aaron Golladay sent letter.
	▸ WA State Department of Fish & Wildlife	Crose/Lotz	4/8/16	Eric Pentico letter sent.
	▸ US Bureau of Reclamation	Crose/Lotz	4/8/16	Clint Wertz letter sent.
	▸ Quincy-Columbia Irrigation District	Crose/Lotz	4/8/16	Darvin Fales letter sent.
	▸ Grant County Black Sands Irrigation District	Crose/Lotz	4/8/16	Tom Flint letter sent.
	▸ Moses Lake Irrigation Rehabilitation Dist	Crose/Lotz	4/8/16	Chris Overland letter sent.
	▸ East Columbia Basin Irrigation District	Crose/Lotz	4/8/16	Craig Simpson letter sent.
	▸ Orchard/Vineyard Grower	Crose/Lotz	4/8/16	Richard Leitz, WA Fruit, Jones Produce, Stemilt, Bob Murphy, George Jelmberg, Mike Taylor, Jerry Milbrandt
	▸ Dryland Farmers	Crose/Lotz	4/8/16	Jerry Dormaier, Mike Edwards, Paul Walker Jr., Chris Edwards, Brian Knopp, Wes Sieg invite letter.
	▸ Irrigated Agriculture cross section of county	Crose/Lotz	4/8/16	Sam Krautscheid, Boe Clausen, Austin Allred, Rodney Youngren, Denny Michelson, Dan Roseburg, Dale Gies
	▸ Dairy Federation	Crose/Lotz	4/8/16	Tony Freeman sent invite letter to be on Work Group/attend first meeting.

VSP Assistance to Neighboring Counties	► Kittitas County	Crose/Lotz Crose/Lotz	2/10/17 2/22/17	NRCS data information 2011-2016 in spreadsheet with future contracts. Demonstration at Work Group meeting about VSP process.
	► Okanogan County	Crose/Lotz Crose/Lotz	4/6/17 6/19/17	Demonstration at Work Group meeting about VSP process. NRCS data information 2011-2016 in spreadsheet with future contracts.
	► Lincoln County	Crose/Lotz	12/6/16	NRCS data information 2011-2016 in spreadsheet with future contracts
	► Franklin County	Crose/Lotz	12/6/16	NRCS data information 2011-2016 in spreadsheet with future contracts.
	► Adams County	Crose/Lotz	12/6/16	NRCS data information 2011-2016 in spreadsheet with future contracts.
	► Whitman County	Crose/Lotz	12/6/16	NRCS data information 2011-2016 in spreadsheet with future contracts.
	► Columbia County	Crose/Lotz	1/11/17	NRCS data information 2011-2016 in spreadsheet with future contracts.
	► Ferry County	Crose/Lotz	2/6/17	Discuss VSP process in Grant County, shared outreach and VSP PowerPoints, shared VSP Fact Sheet.
	► Walla Walla County	Crose	2/10/17	Discuss VSP process in Grant County.