Okanogan County

Voluntary Stewardship Program

Work Plan

Okanogan County, Washington

September 17, 2018

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Funded by:
Washington State Conservation Commission

VSP Statutory Requirements and Plan Elements

RCW 36.70A.720 (1) requires that the work plan accomplish each of the elements below to demonstrate protection of critical areas while maintaining the viability of agriculture in the watershed:

Statutory Requirement	Plan Section	Pg. #
(a) Review and incorporate applicable water quality, watershed management, farmland protection, and species recovery data and plans;	Section 2.3: Critical Areas	19
	Section 5.2 Critical Area Protection & Enhancement Goals	51
	Appendix A: Related Plans, Regulations and Programs	76
	Appendix D: Critical Area Data	100
(b) Seek input from tribes, agencies, and stakeholders;	Section 1.3: Work Plan Development	11
	Appendix J: Outreach Plan	141
(c) Develop goals for participation by agricultural operators conducting commercial and noncommercial agricultural activities in the watershed necessary to meet the protection and enhancement benchmarks of the work plan;	Section 5: Goals and Benchmarks	50
(d) Ensure outreach and technical assistance is provided to agricultural operators in the watershed;	Section 7.1 Implementation Roles	72
	Appendix J: Outreach Plan	141
(e) Create measurable benchmarks that, within ten years after the receipt of funding, are designed to result in (i) the protection of critical area functions and values and (ii) the enhancement of critical area functions and values through voluntary, incentive-based measures;	Section 5.3: Participation Benchmarks for Critical Areas Protection	57
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(f) Designate the entity or entities that will provide technical assistance;	Section 6: Monitoring and Adaptive Management	64
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(g) Work with the entity providing technical assistance to ensure that individual stewardship plans contribute to the goals and benchmarks of the work plan;	Section 6: Monitoring and Adaptive Management	65
	Appendix H: Stewardship Checklist	125
	Section 5.3.2: Inventory of Participation	58
(h) Incorporate into the work plan any existing development regulations relied upon to achieve the goals and benchmarks for protection;	Section 5.2: Goals	51
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(i) Establish baseline monitoring for: (i) Participation activities and implementation of the voluntary stewardship plans and projects; (ii) stewardship activities; and (iii) the effects on critical areas and agriculture relevant to the protection and enhancement benchmarks developed for the watershed;	Section 3: Baseline and Existing Conditions	29
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(j) Conduct periodic evaluations, institute adaptive management, and provide a written report of the status of plans and accomplishments to the county and to the commission within sixty days after the end of each biennium;	Section 7: Implementation and Reporting Table 6-1 (outlines adaptive management triggers)	73 69
(k) Assist state agencies in their monitoring programs; and	Section 6.2.1: Effectiveness Monitoring Section 6.2.2: Assisting Outside Organizations	65 66
(l) Satisfy any other reporting requirements of the program.	Section 7.2 Reporting	74

Foundations of the Okanogan County Work Plan

The Okanogan County VSP Work Plan represents a locally driven effort to protect critical areas and to promote the viability of agriculture. The plan aims to:

- Rely entirely on voluntary participation to achieve program requirements, goals, and benchmarks.
- Recognize agriculture as a centerpiece of our communities and culture and as a vital asset in the ongoing protection of critical areas.
- Promote flexibility for agricultural producers in terms of how they use and protect the land.
- Rely on existing resources to the maximum extent possible.
- Align with the customs and culture of Okanogan County residents.
- Respect private property rights and protect the right of landowners to use and enjoy their property.
- Build on the existing stewardship ethic in Okanogan County and foster stronger partnerships between key stakeholders such as agricultural producers, the conservation community, technical assistance providers, state and federal agencies, local governments, and tribes.
- Protect the unique and diverse ecological communities of Okanogan County and the natural resources that support their health.
- Recognize that agricultural activities and natural resource protection are not mutually exclusive concepts, but are rather inextricable components of a robust, sustainable economy.

Resolution

It is the expressed intent of this Work Group to work collaboratively with farmers, stakeholders, and landowners conducting agricultural activities. If progress towards the goals and benchmarks is not proceeding in a satisfactory manner, further outreach and education will be developed and implemented to address the shortcomings of this plan. The work group will not rely upon mandatory enforcement as described under RCW 36.70A.720 (3) and will not use this plan to encourage any agency or the County to conduct focused enforcement.

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Appendices

Abbreviations

BLM	US Bureau of Land Management
BOR	US Bureau of Reclamation
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinance
CARA	Critical Aquifer Recharge Area
CMZ	Channel Migration Zone
CPPE	Conservation Practices Physical Effects
CREP	Conservation Reserve Enhancement Program
CCT	Colville Confederated Tribes
FFA	Frequently Flooded Area
DNR	Washington Department of Natural Resources
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHZ	Flood Hazard Zone
FWHCA	Fish and Wildlife Habitat Conservation Area
GHA	Geologically Hazardous Area
HPA	Hydraulic Project Approval
NAIP	National Agriculture Imagery Program
NDVI	Normalized Difference Vegetation Index
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OCD	Okanogan Conservation District
PHS	Priority Habitat and Species
PUD	Public Utility District
RCW	Revised Code of Washington
READ	Resource Economic Analysis Division
USDA	United States Department of Agriculture
USFS	United States Forest Service
USGS	United States Geological Survey
VSP	Voluntary Stewardship Program
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
Workgroup	Okanogan County Voluntary Stewardship Program Workgroup
Work Plan	Okanogan County Voluntary Stewardship Program Work Plan
WRIA	Washington Resource Inventory Area
WSCC	Washington State Conservation Commission
WSDA	Washington State Department of Agriculture

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Acknowledgments

The approved plans from several Counties were used to guide the Okanogan County VSP. Particular appreciation is due to the staff and work group who completed the Stevens County VSP Work Plan and Grant County VSP Work Plan for providing a helpful framework for the Okanogan VSP process.

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1 Introduction

1.1 Purpose

The Voluntary Stewardship Program (VSP) is an alternative to traditional top-down regulations for the protection of critical areas on agricultural lands. Enabled under the Washington State Growth Management Act (RCW 36.70A), the VSP uses a collaborative, stakeholder-driven process to identify, coordinate, and build on existing programs and practices that address agricultural effects on critical areas. These practices are then implemented by individual farmers through voluntary, site-specific stewardship plans. Maintaining agricultural viability while protecting critical areas is a key component of the VSP and this Work Plan.

The purpose of this Work Plan is to fulfill VSP legislative requirements to create a voluntary set of goals and benchmarks to protect and enhance critical areas while maintaining and improving agricultural viability in Okanogan County. While the goals and benchmarks within this Work Plan apply to privately owned land in the County, state and federal lands are a significant portion of the County's land base and have a notable role in the agricultural viability component of the plan.

1.1.1 Overall Program Goals

According to RCW 36.70A.700 (2), the overall goals of the VSP are to:

- protect and enhance critical areas within the area where agricultural activities are conducted, while maintaining and improving the long-term viability of agriculture and reducing the conversion of farmland to other uses;
- focus and maximize voluntary incentive programs to encourage good riparian and ecosystem stewardship as an alternative to historic approaches used to protect critical areas;
- leverage existing resources by relying upon existing work and plans in counties and local watersheds, as well as existing state and federal programs to the maximum extent practicable to achieve program goals;
- encourage and foster a spirit of cooperation and partnership among county, tribal, environmental, and agricultural interests to better ensure the program success;
- improve compliance with other laws designed to protect water quality and fish habitat; and

Critical areas include:

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

- rely upon voluntary stewardship practices as the primary method of protecting critical areas and not require the cessation of agricultural activities.

1.2 Core Elements of the Work Plan

The guiding document for the VSP is the Okanogan County VSP Work Plan (Work Plan), the goal of which is to outline a program that will protect critical areas while maintaining agricultural viability. The Work Plan was developed by the Okanogan County VSP Work Group, convened by the County and comprising agricultural producers, local government staff, agency representatives and interest groups. In general, this Work Plan outlines protection and enhancement practices and measurable participation benchmarks, agricultural viability goals and strategies, monitoring methods and adaptive management techniques.

1.2.1 Applicable Area

In 2012, Under Resolution 10-2012, the Board of Okanogan County Commissioners enrolled the entirety of unincorporated Okanogan County in VSP. The County did not recommend any priority watershed to the State.

VSP applies to land where agricultural activities are conducted, as defined by RCW 90.58.065:

"Agricultural activities" means agricultural uses and practices including but not limited to:

- Producing, breeding, or increasing agricultural products; 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 that the replacement facility is no closer to the shoreline than the original facility; and
- maintaining agricultural lands under production or cultivation.

Participation in VSP is voluntary- no landowner is required to participate. Agricultural producers who choose to participate are free to withdraw at any time. VSP is not a replacement for compliance with other local, state or federal laws and regulations but participation in VSP will demonstrate the level of 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.

1.2.2 Work Plan Goals & Monitoring

One of the main components of the Work Plan is to identify stewardship practices that are implemented under existing programs or voluntarily implemented through producer-funded projects 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 VSP implementation and program success. Through a review of critical area protections implemented by agricultural producers since July 2011 (the VSP baseline for protection), it is clear the Okanogan County agricultural community consistently implements stewardship practices which protect critical area functions and values. This Work Plan outlines a strategy for maintaining critical area protection through goals and benchmarks, individual stewardship plans, and monitoring and adaptive management. Technical service providers are identified to assist landowners to plan and implement stewardship projects.

1.3 Work Plan Development

1.3.1 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, including participation by producers, conservation districts (CDs), local and state agencies, and others. The Work Group was convened by the County to develop the Work Plan with technical assistance from the County, the Okanogan Conservation District, and other local agencies. The Work Group and technical staff integrated local plans, monitoring data and programs into the development of the Work Plan (Appendix A).

Table 1-1 Work Plan Development and Roles

Local – Administration and Work Plan Development	
Okanogan County	Administers VSP funding for work plan development, program coordination
Okanogan VSP Work Group	Develops and proposes a work plan for approval by the WSCC
Okanogan Conservation District	Writing and technical support for work plan development
Other Technical Providers	State and federal agencies and stakeholder groups provide technical input during work plan development
Other Local Citizens	Provide input on the work plan
State – Approval and Administration	
Washington State Conservation Commission (WSCC)	Administers VSP statewide; approves/rejects work plans
VSP Technical Panel[1]	Provides technical guidance and assistance, reviews draft work plans, makes recommendations whether to approve or reject the work plans
VSP Statewide Advisory Committee[2]	Works with the WSCC to revise rejected draft work plans

Notes:

1. The VSP State Technical Panel includes members: Ecology, WDFW, WSDA, and WSCC. There is one member from each of these agencies; four members in total.
2. The Statewide Advisory Committee includes representatives of environmental interests, agriculture, counties, and tribal interests, with two representatives invited for each.

The Work Group participants included representatives from the Okanogan County Farm Bureau, Methow and Okanogan watersheds, the Okanogan County Cattleman's Association, horticultural producers, Okanogan County Commissioner's District's 1 and 3 (District 2 representative left the process early on and the vacancy was never filled), and environmental interests. Most Work Group members are active farmers managing range land and livestock, irrigated crop land and orchards, and dryland

farming. Representatives include large and small-scale operations. Many members participate in other regional planning efforts, such as the Methow Watershed Council and Okanogan Watershed Planning.

Okanogan County notified and invited participation from the Yakama Nation and Colville Confederated Tribes during Work Group formation. Biologists and planners with the Yakama Nation and Colville Confederated Tribes received VSP progress updates at watershed meetings and received draft Work Plans for review. Available monitoring and resource planning documents by the Tribes were integrated into this Work Plan. The Work Group did not receive input from the Tribes but will continue to provide program updates.

Okanogan Conservation District staff have many years of experience working with agricultural producers and technical knowledge on assessing and improving critical area functions and values, in addition to being actively engaged in regional planning efforts and direct implementation of conservation projects on agricultural land and in critical areas.

The Work Group sought input and participation by sharing updates on the Conservation District Facebook and website, newsletters, and status updates to the Methow Restoration Council and Similkameen-Okanogan Watershed Action Team meetings.

The Work Group considered Agency and stakeholder planning documents while developing this Work Plan (Appendix A). In addition to stewardship recommendations, watershed plans and resource planning efforts encourage working collaboratively with stakeholders on private lands for conservation improvement. Watershed Plans for the Okanogan and the Methow Rivers, and smaller-scale reach assessments will be incorporated into landowner outreach and on-the-ground planning efforts during the implementation phase. These plans present localized assessments and recommendations on priority projects to protect critical area functions and values.

2 Okanogan County Regional Setting

2.1 Okanogan County Profile

Okanogan County is in North Central Washington State. The County borders Canada in the North, Ferry County in the east. The North Cascade mountains forms the County's western border, and the southern portion of the County is bordered by the Columbia River. Okanogan County is the largest county in the state with a population of 41,554 (US Census Bureau 2016). Part of the Colville Reservation overlaps with a portion of Okanogan County.

The County's climate is generally cold in winter and hot and dry in summer. While most of Okanogan County is considered semi-arid, precipitation and average temperatures vary (Appendix B). The geology, climate, and topography creates a semi-arid region that influences agriculture, land use, hydrology, and habitat (Okanogan Watershed Planning Unit, 26).

2.1.1 Soil and Terrain

Okanogan County's topography ranges from mountainous alpine and sub-alpine terrain to gently sloping valleys. Elevation varies from 750 feet where the Columbia River crosses the county line south of Pateros, to over 8,500 feet in the Cascade mountains.

The landscape below 5,000 feet was sculpted by glaciers about 10,000 years ago. Large areas remain covered with rocks deposited by the glaciers melting and receding. The receding glaciers also left valleys, canyons, waterfalls, benches, lakes, and cliffs.

Most soils are deep and well drained. Gravelly loam, silt loam, and sandy loams dominate the surface horizons throughout the County (USDA 1980). Forest soils are often volcanic ash capped and finer textured soils can be found in lower lying areas.

Alluvial soils along the Okanogan and Methow Rivers, and many tributaries, are prime irrigated and sub-irrigated farmland. Approximately one third of the County is forested, and much of the rest of the area is shrub-steppe with some dryland agriculture (USDA 1980).

2.1.2 Water Resources and Precipitation

Water Resources

The county includes 8 major watersheds, which are known as Water Resource Inventory Areas (WRIA) (Figure 2-1).

- Okanogan River (WRIA 49)
- Sanpoil River (WRIA 52)
- Nespelem River (WRIA 51)
- Foster Creek (WRIA 50)
- Methow (WRIA 48)
- Kettle River (WRIA 60)
- Lower Lake Roosevelt (WRIA 53)
- Chelan (WRIA 47)

Figure 2-1 Water Resource Inventory Areas (WRIA) in Okanogan County

Precipitation

Annual precipitation ranges from approximately 8 inches at the confluence of the Okanogan and Columbia Rivers, to more than 60 inches in the upper elevations of the Pasayten and Ashnola sub watersheds. Snow can be expected after the first of November and remains on the ground from the first of December until March or April. On average, snow accumulates to a depth of about 10 to 20 inches in the valleys (Okanogan Watershed Planning Unit 27).

Table 2-1 Average Annual Climate throughout Okanogan County (WRCC, 2016)

Town	Max. Temp (F) Jul/Aug Avg	Min. Temp (F) Dec/Jan Avg	Precipitation[1] (in.)	Snowfall (in.)
Oroville	87.5	23	11.4	22.8
Tonasket	86.5	23	11.4	13.9
Omak	89.5	22.5	11.9	No data
Bridgeport	89	21.5	10.3	25
Chesaw	79.5	13	13.5	52.8
Conconully	82.5	15.5	14.6	42.8
Winthrop	86.5	12.5	14.1	70.5

1. Precipitation includes rain, snow, hail, etc.

2.1.3 Land Use and Landcover

The landscape is largely forested at higher elevation, with shrub-steppe habitat dominating the landscape at lower elevations. Shorelines and other wet areas support riparian and wetland vegetation.

Communities and agricultural operations in Okanogan County are generally concentrated in the Methow and Okanogan valleys and along the Columbia River. Notable land-use activities include agriculture, recreation, mining, and forestry. Approximately 57% of private land, including private land within the Colville Reservation, is in agricultural production. Agricultural lands are associated with irrigated crops, rangelands, and dryland crops (USDA Census of Agriculture; WSDA Cropland Data; Okanogan County Assessor).

2.1.4 Land Area

Okanogan County encompasses approximately 3,409,840 acres (5,268 square miles), including surface water. Approximately 58% of the land in the county is owned by federal, state or local agencies. Privately owned land comprises approximately 26% of the County. The Confederated Tribes of the Colville Reservation (CCT) own 16%, which includes land inside and outside of the Reservation boundaries (Okanogan County Assessor 2017). Some land within the reservation boundary is under the jurisdiction of both Okanogan County and CCT.

Table 2-2 Summary of Land Ownership in Okanogan County (excludes surface water) (Okanogan County Assessor 2017).

Ownership Type	Acres	Percent
Federal	1,570,845	46%
Private	872,733	26%
Tribal	525,751	16%
State	430,159	12%
Total Land	**3,399,488**	**100%**

Federal agencies that own and manage land include the US Forest Service, Bureau of Land Management, and the Bureau of Reclamation. State agencies include the Department of Fish and Wildlife, Department of Natural Resources, State Parks and Recreation. Local governments and the Okanogan Public Utility District also own land (less than 1%).

2.1.5 Major Resource Concerns

Major Resource Concerns in Okanogan County are listed below, in no order.

- Wind erosion
- Water erosion/flooding
- Water quantity
- Water quality
- Invasive species (plant & animal)
- Forest health
- Range health
- Wildfire hazards
- Depredations of livestock by predatory wildlife
- Crop impacts from grazing ungulates
- Pollinator habitat
- Soil health/cover crops

2.2 Agricultural Activities

Agriculture is a significant component of the Okanogan County economy. Crop and animal production and agriculture associated businesses is the County's provides more jobs than any other sector (WA Employment Security Department 2017). Approximately 57% of privately owned land, 500,136 acres, is designated agricultural production and average farm size is among the largest in the state, 825 acres (Okanogan County Assessor 2011, USDA 2012, WSDA 2011). Per the 2012 Census of Agriculture, crop sales account for 87% of the value of products sold in the County.

Statewide, per the USDA Census of Agriculture (2012) Okanogan County:

- Has an annual market value from agricultural products of approximately $280 million.
- Is the fourth highest producer of fruit (sales value) in Washington.

- Is the eight highest producer (sales value) for cattle and calves in Washington.
- Has the third highest acreage of apples in Washington.
- Has the fifteenth highest acreages of vegetables, hay, and corn (for grain) in Washington.

Topography affects agricultural activities and productivity in Okanogan County. The County's productive irrigated lands are located near surface water, where there is a consistent water supply from groundwater, rivers, streams, lakes, or impoundments. Irrigated and dryland crops comprise 6% and 3% of the County private lands respectively (Okanogan County Assessor 2011, USDA 2012, WSDA 2011). Table 2-3 provides an overview of dryland, irrigated and range lands.

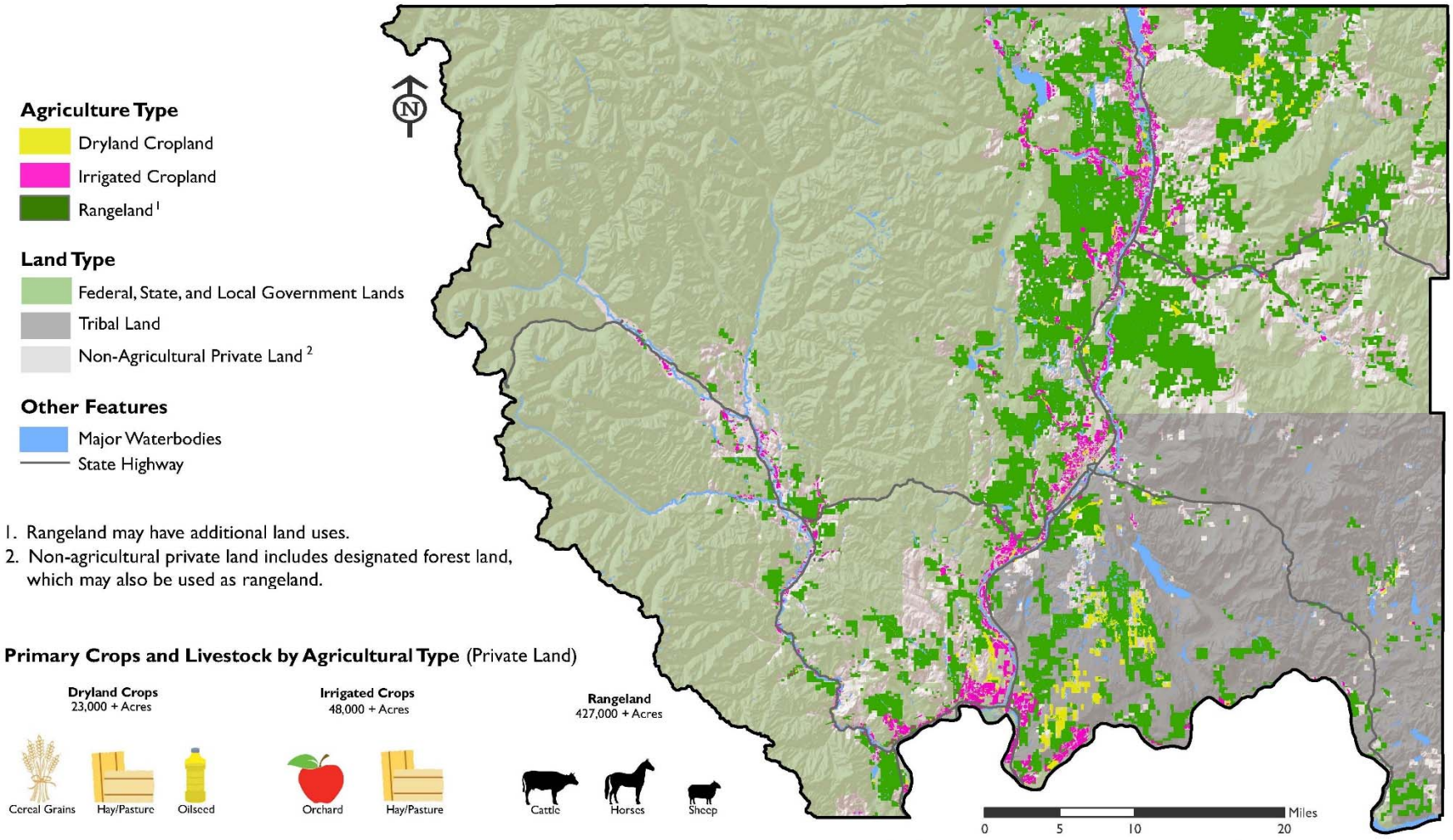
Rangelands account for at least 49% of private land, and county-wide livestock sales account for approximately 13% of the value of products sold. Many additional acres of private and public lands are utilized as range but are unaccounted for in census and private land use surveys like the County Assessor data. For example, some private lands may be designated forest land through the County Assessment procedure but are also utilized for livestock production. Much of the Federal, State, and Colville Reservation forest land at lower elevations is commonly permitted or leased as agricultural land.

Table 2-3. Summary of Agricultural Activity and Products on private lands, including private land within the Reservation (Okanogan County Assessor 2011, USDA 2012, WSDA 2011).

Agricultural Type	Acres	% of Private Land	Primary Crops/Livestock
Dryland	23,838	3%	Cereal grains, Hay/Pasture, Oilseed
Irrigated	48,435	6%	Orchard, Hay/Pasture, Grapes, Pigs
Rangeland	427,863	49%	Cattle, Horses, Sheep
Total	500,136	58%	



Agriculture on Private Lands in Okanogan County



SOURCE: WSDA Cropland Data (2011), Okanogan County Parcel Data (2011), USDA Agricultural Census (2012)

DISCLAIMER: While every precaution was taken in preparing this map, the publisher disclaims any warranty of fitness or accuracy of the data. The map is approximate in nature, based on compilation of data from multiple sources, and should not be substituted for appropriate survey and/or engineering analysis. The user of the map acknowledges its limitations and assumes all responsibility for its use.

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2.2.1 Agriculture on Public Land

A portion of the state and federal (public) land in Okanogan County is leased or permitted to private landowners for grazing, dryland, and irrigated agriculture (Table 2-4). Access to public lands, particularly for grazing, is essential for agricultural viability. Cooperative management between public agencies and permittees and leaseholders is vital to the agricultural economy as well as protection and enhancement of critical areas on public land.

Table 2-4 Acres of agricultural leases and permits available on State and Federal lands (public) in Okanogan County.

Agency	Grazing	Irrigated	Dryland
US Forest Service*	671,405	0	0
US Bureau of Land Management	48,000	0	0
US Bureau of Reclamation	468	0	0
WA DNR	89,033	4,750	350
WDFW Methow	14,076	376	170
WDFW Okanogan	19,859	681	230
Total	**842,841**	**5,807**	**750**

Data was collected by direct communication with agency staff.
*USFS includes Methow and Tonasket Ranger Districts (permitting 318,553 and 352,852 acres, respectively).

Approximately 909,334 acres of Colville Reservation land is potentially available to the public for range permits.

2.3 Critical Areas

2.3.1 Critical Areas Definitions

The five critical areas defined under RCW 36.70A.030 include: 1) wetlands; 2) fish and wildlife habitat conservation areas (FWHCAs); 3) critical aquifer recharge areas; 4) geologically hazardous areas (GHAs); and frequently flooded areas (FFAs). Critical areas perform key functions that enhance the environment (e.g., water quality and fish and wildlife habitat), and provide protections from hazards (e.g., flood, erosion, or landslides). The Work Plan addresses all five critical areas.

Agricultural activities impacting critical areas will be addressed under VSP and the County will continue to regulate structures proposed within agricultural lands for any of the five critical areas, whether they are related to agricultural activities or not, through the County's Critical Area Ordinance (CAO) or other applicable code. Structures are defined by Okanogan County Zone Code 17A and Floodplain Code 15.08. A full list of applicable regulations is in Appendix A.

Critical areas designations are described in Appendix C. The current CAO for Okanogan County was adopted in 1994, and a new CAO is being developed to address updated GMA standards. For the purpose of this Work Plan, critical areas designations were developed by integrating the current code with updated critical area requirements and recommendations. Once a new County CAO is adopted, critical area designations may be amended to reflect the updated CAO during reviews of the Work Plan.

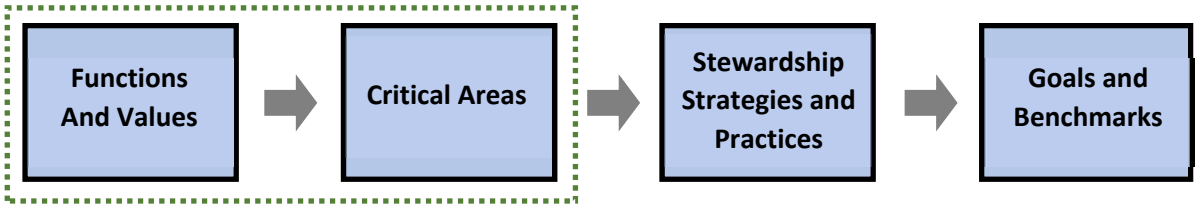
The five critical areas are summarized below.

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
Wetlands 	Wetlands are areas inundated or saturated by surface water or ground-water 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 WA Department of Ecology for guidance). **Functions:** Water quality, hydrology, and habitat
Fish and Wildlife Habitat Conservation Areas (FWHCAs) 	FWHCAs 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. The Work Plan focuses on protecting habitat for en-dangered, sensitive and threatened species. **Functions:** Water quality, hydrology, soil, and habitat
Geologically Hazardous Areas (GHAs) 	GHAs are areas susceptible to erosion, sliding, and other geological events. Erosion may be related to water or wind. Channel migration zones and flood hazard zones are mapped by the County. **Functions:** Water quality, hydrology, soil, and habitat
Frequently Flooded Areas (FFAs) 	FFA's include 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. **Functions:** Water quality, hydrology, soil, and habitat

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 critical areas in the County can be summarized into four major functions, which include: 1) water quality; 2) hydrology; 3) soil; and 4) fish and wildlife habitat (Table 2-5). 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 Crosswork – Areas Connection with Functions and Values



Each critical area provides one or more of these key functions and values, which are summarized in Table 2-5. The relationship between each critical area, with key functions and values, is discussed further in the following sections. See Section 3 for further discussion on the baseline conditions and practices to improve these key functions.

Table 2-5 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	•	•	•	•
Frequently Flooded Areas	•	•	•	•

Water Quality Function

Critical areas, such as stream channels, riparian areas, and wetlands, are part of the aquatic ecosystem that filters and retains excess sediment 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. Functioning critical areas also help moderate water temperatures by providing shade and cooler water from recharged groundwater, which helps maintain cooler water temperatures and dissolved oxygen levels needed to support native aquatic species.

In Okanogan County, some water bodies (including the Methow River, Okanogan River, and several tributaries and lakes) are identified by the Washington Department of Ecology for having one or more beneficial uses impaired. Common impairments include high water temperatures, low dissolved oxygen, elevated pH, presence of DDT (and derivative breakdown products) and PCBs, and low stream flow. The full list of impaired waterbodies is included in Appendix D: Critical Area Data and more detail can be found in reports listed in Appendix A.

Surface and groundwater water quality may be affected by excess nutrients and fertilizers, bacteria, and sediment from soil erosion, which have natural and human origins. Further planning and site assessments are needed to determine the source of impairment.

All five critical areas provide water quality functions, as summarized in Table 2-6.

Table 2-6 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 and cool water recharge
FWHCA	• Reduces siltation by stabilization of streambanks from riparian vegetation • Provides water filtration and nutrient cycling for nitrogen and phosphorus • Moderates water temperature by providing shade
CARA	• Infiltration through soil column and underlying geology improves groundwater quality and protects public drinking water supplies
GHA	• Affects rate of soil erosion and associated movement of sediment deposited in surface water bodies
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 slow release of cooler groundwater from unconfined aquifers back to streams, and by vegetation that can provide shade

Hydrology Function

Hydrology refers to the processes of water delivery, movement, and storage. In an ecosystem, hydrology is affected by landform, geology, climate (including precipitation), vegetative cover, and soil characteristics such as moisture content and temperature. Stream channels, riparian areas, and wetlands are also a part of the hydrologic cycle that stores and transports water and sediment, maintains base flows, and can support vegetation and microorganism communities.

In Okanogan County, hydrology is primarily a factor of winter snow fall, mountain snow pack, valley rains in the fall and spring, and groundwater flow. Most precipitation in Okanogan County occurs October through April. Valley rain provides soil profile moisture for crop and native plant production through the spring and into early summer. In the arid climate of Okanogan County, most of the precipitation during storm events is not available for plants due to high evapotranspiration (Walters, 1974).

Springtime snow melt from mountain snowpack in Washington and British Columbia, Canada, is the primary contributor to stream and ground water aquifers. Peak flows in tributary streams in Okanogan County generally occur from late April through late May. Due to the topography and location of its upper headwaters in British Columbia, peak flows in the Okanogan River typically occurs in June. Annual and seasonal discharges vary substantially in rivers and tributaries.

The Methow River is greatly impacted by exchanges between surface and shallow ground water aquifers located in unconsolidated sediment. These shallow aquifers provide water for domestic and agricultural supply but also are an integral component to maintain stream flows and lower stream water temperatures.

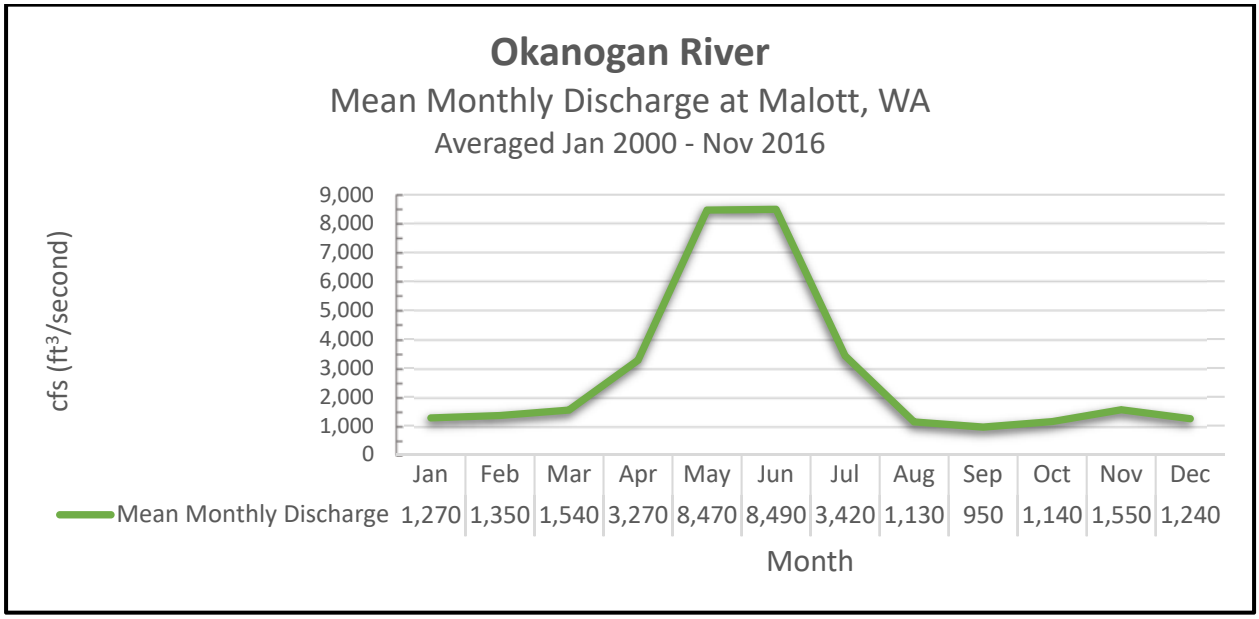
The County also has numerous lakes with no stream outlets, resulting in relatively mineralized water. Omak Lake is the largest of these lakes, which provide unique fish and wildlife habitat and recreational opportunities (Walters, 1974).

A low winter snow pack is a significant threat to stream flows and groundwater levels, and can impact critical area functions and agricultural irrigation. Water infiltration rates are impacted by soil permeability, which can be a function of soil temperature. Rain events or snow melt on frozen soil reduces infiltration and can reduce groundwater recharge. Irrigation diversions affect the flow and timing of many surface water ways. Irrigation withdrawals and conveyance canals can also impact groundwater levels and soil moisture depending on whether or not they are opened canal or piped.

More information on hydrologic conditions throughout the County can be found in the Okanogan Watershed Plan, the Methow Watershed Plan, and multiple reports and assessments.

All five critical areas provide hydrology functions, as summarized in Table 2-7.

Figure 2-2 Okanogan and Methow River hydrographs.
Peak flows in the Okanogan and Methow Rivers occur in late spring. Figures show mean annual discharge from January 2000 to November 2016, recorded at USGS monitoring stations in Malott and Twisp.



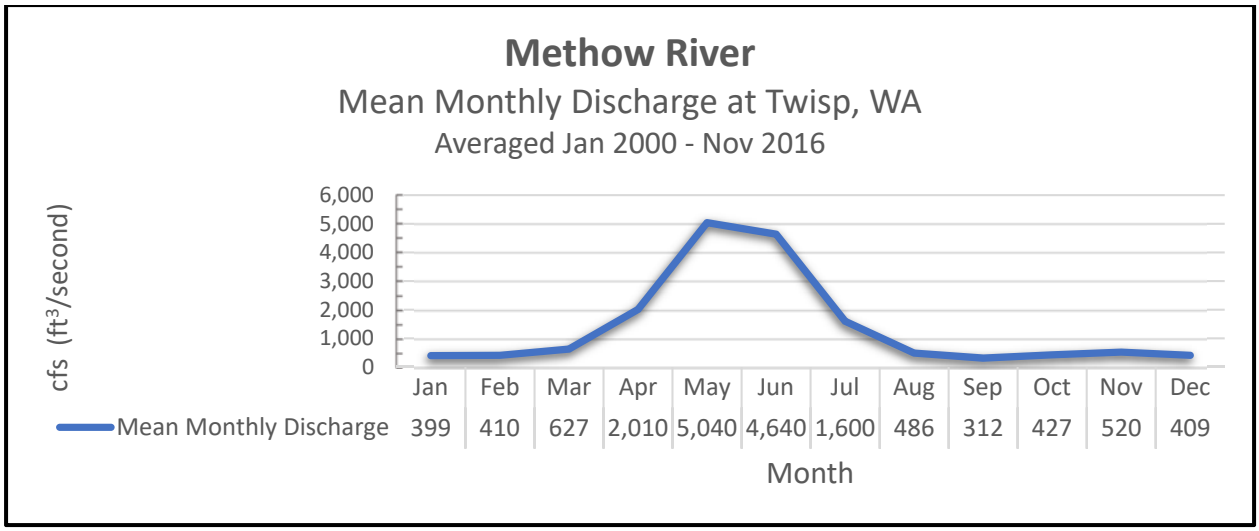


Table 2-7 Critical Areas Providing Hydrology Functions

Critical Area	Hydrology Functions
Wetland	• Stores water to reduce flooding and contributes to base flows
FWHCA	• Stores and retains water to reduce flooding and support base flows in streams • Provides for recruitment of large wood, which slows flows and stabilizes channels. • Provides habitat for beavers, which can potentially reduce downstream flooding and improve riparian habitat health.
CARA	• Recharges groundwater resources
GHA	• Affects 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 return to streams and help maintain base flow

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 Okanogan County, agriculture preserves lands from more intensive development, and farmers can be the County's most valuable soil managers by effectively managing grazing, tillage, and pesticide and fertilizer applications. 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 can impact beneficial soil organisms. Overgrazing by livestock can reduce vegetative cover and expose soils to erosion.

Three critical areas provide soil functions, as summarized in Table 2-8.

Table 2-8 Critical Areas Providing Soil Functions

Critical Area	Soil Functions
FWHCA	• 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 Function

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

In Okanogan County, intensively managed agricultural land is interspersed with rural home development and diverse native landscapes. Abundant hunting and fishing opportunities are valued by residents and visitors. Grasslands, shrub-steppe, riparian-wetlands, and ponderosa pine forest are common in the County and are considered Ecological Systems of Concern because they are at-risk and they are considered Habitats of Greatest Conservation Need because they are closely associated with several Species of Greatest Conservation Need (WDFW, 2005b).

Habitat conversion, fragmentation, and degradation post the most serious statewide threat to Washington's native fish and wildlife resources (WDFW 2005a). Agricultural practices can contribute to these factors when native habitat is removed, and waterways are altered.

Croplands can provide benefit as a food source for species such as deer and migrating birds. Properly managed grazing can be neutral or even beneficial to wildlife (WDFW, 2005a).

In the County, habitats include diverse forest and aquatic habitats, eastside (interior) grasslands, shrub-steppe, wetlands, and riparian areas that support aquatic and terrestrial species. **Common fish and wildlife species in Okanogan County include:**

- **Mule Deer**
- **Whitetail Deer**
- **Moose**
- **Elk**
- **Bighorn Sheep**
- **Bald Eagle**
- **Golden Eagle**
- **Black Bear**
- **Cougar**
- **Bobcat**
- **Coyote**
- **Rainbow Trout**
- **Chinook Salmon**
- **Sockeye Salmon**

This work plan will prioritize protecting habitat for endangered, sensitive and threatened species.

Spring Chinook, steelhead and bull trout are examples of high priority endangered or threatened species in the County. See Appendix D for a summary of Priority Habitats and Species data agricultural overlap and Appendix B for a mapped representation.

Four critical areas provide habitat functions, as summarized in Table 2-9.

Table 2-9 Critical Areas Providing Habitat Functions

Critical Area	Habitat Functions
Wetland	• Provides aquatic and woody vegetated habitat for fish and wildlife
FWHCA	• Provides in-stream spawning, rearing and migratory habitat for fish • Provides upland and riparian migration corridors, refuge, forage, nesting, and rearing areas for wildlife • Improves aquatic habitat by supplying organic inputs (e.g., leaf fall, insects, and large wood) and providing shade • Supports sensitive species life cycles
GHA	• Affects 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 VSP is not intended to restore critical areas to pre-development conditions. However, its intended goal is to maintain the functions and values that existed as of July 22nd, 2011. The 2011 baseline sets the conditions from which the County will measure progress in implementing the Work Plan and meeting measurable benchmarks Section 5. Stewardship strategies and practices have been implemented since 2011 to improve agricultural productivity, reduce erosion, and improve soil and water quality.

Changes to the baseline conditions have and will occur because of natural weather variation, natural events (e.g., wildfires), or other changes outside the scope of VSP. Additional changes to critical areas may occur in the County that are the result of activities outside of the County jurisdictional boundaries, such as effects to watercourses. These changes will be documented with the best available data through the reporting and adaptive management process discussed in Sections 6. Annual weather variability can affect critical areas unrelated to agricultural practices. Prolonged drought, annual snowpack variability and run off patterns affect water availability. Similarly, high snow pack and precipitation may have positive impacts for agriculture and critical area functions. Climate variations should be considered when assessing the gains and efforts made by ranchers and farmers under the VSP program.

Post-fire flooding on Benson Creek. This property is involved in a riparian restoration project.

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 B: VSP Map Folio
- Appendix E: 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 FWHCAs 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.

Table 3-1 summarizes the potential presence of critical areas within the County that intersect with agricultural activities on private lands.

Table 3-1 Critical Areas Within Okanogan County Agricultural Lands

Critical Area Type	Acres within Agricultural Lands[1]	% of Total Agricultural Lands[1]
Wetlands (all types)	20,237	4%
Fish and Wildlife HCAs	235,715[2]	47%
Critical Aquifer Recharge Area	8,239	2%
Geologically Hazardous	19,821	4%
Frequently Flooded Area	6,634	1%

1. Agricultural lands include only privately owned lands. All calculations include privately owned lands within the Colville Confederated Tribes Reservation, except Fish and Wildlife HCA's due to lack of information.
2. Fish and Wildlife HCA's include game and non-game PHS, and endangered, threatened and sensitive species. The goals of this work plan will protect habitat for endangered, threatened and sensitive species.

Game Species in Priority Habitat and Species (PHS):

PHS data and mapping are maintained by WDFW in part to provide a reference to the potential existence of FWHCAs. Game species habitat as mapped in PHS overlap with approximately 200,000 acres of the County's private agricultural lands, comprising primarily of mule deer, white-tail deer and bighorn sheep. These habitats are mapped over all types of agricultural land.

- **Protection goals:** Protection efforts under VSP are focused on state and federally listed endangered, threatened and sensitive species. 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) for these habitats is also expected to benefit game species.
- **Enhancement goals:** Enhancement efforts under this Work Plan includes practice implementation that exceeds protection metrics. Conservation easements are considered enhancement practices since they are in perpetuity, and disenrollment is practically 0. Water trusted results in significant improvements to CARAs and FWHCAs and is considered an enhancement practice.

See Figure 2 in Appendix B, and Appendix E for additional details on PHS species.

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 the National Wetland Inventory Map (USFWS 2016), wetlands are found within 4% of the County's total agricultural lands (including private land on the Colville Reservation) (Figure 3, Appendix B), which represents approximately 17% of the wetlands found within the County. Wetlands within the County are influenced by water management practices, including water efficiency and stewardship practices for the delivery and use of water for irrigation and livestock. Improving water management, which is happening through projects and practices implemented in Okanogan County each year, may affect the size and number of wetlands and associated habitats. When wetlands dry 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 • Plateaus with pothole lakes
Intersections with Agricultural lands	• River valleys and streams with seasonally wet areas (most have been farmed prior to 2011). • Most are within rangelands, with some on dryland and irrigated lands.
Characteristics	• Most wetlands are freshwater emergent or riverine wetlands.

3.1.2 Fish and Wildlife Habitat Conservation Areas

Characteristics and functions overview: FWHCAs include streams, riparian vegetation, and upland Priority Habitats that provide water quality, hydrology, soil health, and habitat functions. FWHCAs provide migration corridors; breeding/reproduction area; forage, cover, and refugia; and wintering habitat for wildlife species. Streams provide key habitat and streamside vegetation functions as a source of organic materials, habitat structures and cover, slope and streambank stabilization, and shade to help regulate water temperatures. Large habitat areas provide for species that require large spaces or range for migration, forage and cover. Habitats of local concern may support sensitive species throughout their lifecycles, or are areas of limited availability, or high vulnerability to alteration. FWHCAs help improve water quality, affect hydrology, contribute to soil health, and provide a variety of habitats. Unique habitat types include sand dunes and shrub-steppe. Washington's State Wildlife Action Plan (2015) provides more detail on the specialized plants and animals that rely on critically imperiled habitat like inland dunes.

The goals of this Work Plan will primarily address endangered, threatened and sensitive species. A principle way it accomplishes this is by protecting the function of the Priority Habitats upon which these (and other species) depend.

3.1.2.1 Priority Habitats and Species

Intersections on agricultural lands:

Fish and wildlife are diverse and abundant in Okanogan County. Priority Habitats and Species (PHS) mapped habitats overlap with 47% of agricultural lands. Much of this overlap is related to the large habitat range of migratory species like mule deer.

The development of croplands in Okanogan County has tended to be in low elevation valleys. Livestock grazing occurs from the shrub-steppe to montane forests. Winter pastures are often located in low elevation valleys, near streams and rivers. Agricultural conservation practices that offer greater landscape variability, and high perimeter-to-area habitats, can provide meaningful benefit to many different species. Deer and elk also use the low elevation lands for grazing and reproduction. Agriculture can provide a benefit by providing forage but at too high intensity, deer and elk can negatively impact agricultural viability by causing damage to crops.

Priority Habitats and Species on Agricultural Lands	
General locations/ distribution	• Vast mammal habitat (largely game species such as mule deer) with low to higher elevation migration routes. • Ponds, riparian and wetlands providing habitat for multiple species. • Shrub-steppe of varying quality provides habitat for a variety of species.
Intersections with Agricultural lands	• Agricultural lands and Priority Habitats are interspersed throughout the County.
Characteristics	• Unique Priority Habitats include shrub-steppe and sand dunes. • Wetlands and riparian areas are prevalent FWHCAs interspersed throughout the County and associated with many species of birds, mammals and amphibians.

3.1.2.2 Stream and Riparian Habitat

Intersections on agricultural lands: Agricultural lands are established on one or both banks along much of the Okanogan and Methow Rivers. Agricultural lands also overlap with approximately 295 miles of fish-bearing tributary streams (WDFW 2016). Small ephemeral streams are also common.

Riparian vegetation includes the vegetated areas along water sources (wetlands and streams) characterized by plants accustomed to soils with higher water availability than adjacent areas. Riparian areas provide cover for upland wildlife, shade to maintain cool water temperatures for fish, as well as habitat structural elements and biomass for fish. Woody vegetation also prevents bank erosion and reduces siltation by trapping sediments.

Streams and Riparian Areas on Agricultural Lands	
General locations/ distribution	• Riparian habitat is located along major rivers and tributary watersheds throughout the County. Riparian zone width varies greatly by location.
Intersections with Agricultural lands **Characteristics**	• Most irrigated agriculture occurs adjacent to the major rivers. • Rangelands and riparian areas/stream overlap along tributary streams. • Shrubs and trees are the dominant riparian species. Common species include red-osier dogwood, black hawthorn, species of rose, willows, and cottonwood. • Spring Chinook salmon, bull trout, steelhead, and pygmy whitefish are ESA protected fish that are found in Okanogan County and require functional stream and riparian areas.

3.1.3 Frequently Flooded Areas

Characteristics and functions overview: FFAs protect public health and safety by providing temporary 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 degraded soil health based on vegetative conditions, and contribute to riparian habitat diversity (See Figure 4, Appendix B).

Intersections on agricultural lands: FFAs are found within only 1% of the County's total agricultural lands. FFAs typically overlap or are adjacent to wetlands and some FWHCAs. The Federal Emergency Management Agency (FEMA) occasionally works with the County to update floodplain mapping. Updates to the maps are currently underway and changes to the FEMA maps will be reflected in the Work Plan through the adaptive management process.

Frequently Flooded Areas on Agricultural Lands	
General locations/ distribution	• FFA's occur mainly along the Okanogan and Methow Rivers with some areas along the Twisp River and Similkameen River
Intersections with Agricultural lands	• The majority occur overlap with range and irrigated agricultural lands.
Characteristics	• Flooding is typically associated with heavy mountain snowfall followed by warm temperatures in the spring, or by high-intensity, short-duration rainfall. • The risk of flooding increases in burned watersheds.

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 with agricultural land: CARAs include Group A and Group B public drinking wells as mapped by the Washington State Department of Health, and the Duck Lake Groundwater Management Area as delineated in WAC 173-132. The wellhead protection areas for these wells overlap with 1.7% of total mapped agricultural land. Many additional single residence wells are developed throughout the County which should be considered during site specific planning opportunities.

CARAs for the rest of the County are not clearly delineated. The Methow Watershed Council is pursuing studies of the relationship between groundwater, surface water, and domestic and agricultural uses. Despite these uncertainties, water quality improvement and water efficiency projects occur county-wide. Agricultural operators and multi-user irrigation systems improve water efficiency to reduce power costs, upgrade aging infrastructure and to protect in-stream flows for fish and wildlife (Figure 5, Appendix B).

As new information becomes available on CARAs in the County, this part of the Work Plan can be updated through the adaptive management process.

Critical Aquifer Recharge Areas on Agricultural Lands	
General locations/ distribution	• Most are located within cities or towns • Most group wells are along rivers, tributaries where most communities are located.
Intersections with Agricultural lands	• The wells that do overlap are primarily near irrigated agricultural lands.
Characteristics	• Many individual agricultural irrigators and multi-user irrigation systems have improved their efficiency in recent years to address salmon recovery efforts.

3.1.5 Geologically Hazardous Areas

Characteristics and functions overview: Geologically hazardous areas are areas that are susceptible to wind or water erosion, landslides or other geological events. Erosion potential areas, along with wind erosion hazards, are considered in this Work Plan for soil conservation and to reduce the risk of property loss, erosion effects on surface water quality, water infiltration into soil to improve groundwater conditions, and soil health.

Intersections on agricultural lands: In Okanogan County, geologically hazardous areas include Flood Hazard Zones and Channel Migration Zones, slopes greater than 30%, landslide hazard areas, and soils identified by NRCS as unstable and having a high potential erosion, and areas that are exposed to the erosion effect of wind or water (Appendix B: Map Folio). Approximately 4% of Okanogan County's agricultural lands overlap with mapped geologically hazardous areas, based on map data. Wildfires can significantly increase wind erosion, water erosion, and landslide hazards.

Channel erosion following a wildfire.

Geologically Hazardous Areas on Agricultural Lands	
General locations/ distribution	• Channel migration zones and flood hazards are along major rivers and streams. • Wind erosion and landslide risks are identified throughout the county.
Intersections with Agricultural lands	• CMZ and FHZ related hazards are primarily along streams and rivers. • Soil erosion hazards are primarily related to dryland agriculture and range. • Mapped landslides have less than 1% overlap with agricultural land.
Characteristics	• Some tillage practices increase soil erosion hazards. • Burn severity from wildfires increases wind and water erosion hazard, as well as landslide risk.

3.2 Agricultural Viability Baseline Conditions

Agriculture is widely recognized as a pillar of Washington State's and Okanogan County's economies. "In fact, in 2014 it [agriculture] provided more jobs than any other sector/industry countywide" (WA Employment and Security). According to the 2012 USDA Census of Agriculture, the market value of agricultural products sold in Okanogan County surpassed $287 million (USDA 2012). The VSP law explicitly requires critical areas to be protected while, "maintaining and improving the long-term viability of agriculture" (RCW 36.70A.700). A primary tenant of this Work Plan is to meet both requirements.

Agricultural viability in Okanogan 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 3-1 and 3-2 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 3-1 Agricultural Viability – Regional Elements

Regional Elements	
Concept	**Detail**
Stable and secure agricultural land base	Land conversion from agriculture
	Stable water rights
	Public land leases and permits
	Issuance of new water rights (none since 1972)
Infrastructure and services	Utilities/irrigation
	Market access/transportation
	Distance to processing/transfer facilities
Support for best farm management practices	Economically viable solutions
	Balanced approach
	Regulatory certainty
Education, training, and succession planning	Apprenticeships/training
	Interconnectivity with end users
	Business planning
Welcoming business environment	Stable regulatory environment
	Voluntary-based environmental protection
	Stable access to labor
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
	Ability to transition to different crop to meet market demands

At the farm level, agricultural viability rests mostly on the productivity of the land, the ability of the operator to balance input costs with sales and market pressures (Table 3-2) and maintaining or expanding land ownership for agriculture. Due to the presence of irrigation water, variable microclimates, and varied topography, Okanogan County has a large variety of agricultural products and practices. Therefore, there is not one universal agricultural viability concern.

The reduction of land available for agriculture has been identified as an obstacle to maintaining the economic viability of agriculture. The loss of agricultural land can take many forms, including the following:

1) loss of land through regulatory requirements for buffers;
2) conversion of agricultural land to non-agricultural uses;
3) conversion of land to other uses by the acquisition of private land by public agencies for mitigation and habitat, and;
4) loss of access to public land for grazing.

The Okanogan County VSP encourages the maintenance of an adequate land base for agriculture by encouraging agencies with land management responsibilities to be cognizant of the impact their land management policies can have on the loss of land available for agriculture and overall agricultural production.

The VSP Work Plan encourages preserving the land available for agriculture by:

- Relying on sound land management practices rather than regulatory buffers to protect critical areas.
- Promoting development regulations that encourage development on land less suitable for agriculture.
- Require public agencies where possible to make acquired land and water rights available for agriculture.
- Promoting grazing on public land as an effective management tool.

In Okanogan County there is a varied landscape where private land and farm/ranching operations intersect with National Forest, undeveloped tribal lands and state-owned lands which provide habitat for grazing species such as deer and elk and for major natural predators such as cougars and wolves. If a recovery program is enacted, grizzly bears would be added to the list. Managing these major predators is important for livestock operations to minimize kills which impact rancher profits and herd development. Similarly, wildlife ungulates use crop lands for forage, which reduces harvest profits and ability to provide for domestic livestock. Maintaining species numbers to minimize losses to ranchers and farmers is necessary to maintain agricultural viability in Okanogan County.

Table 3-2 Agricultural Viability – Farm Elements

Farm Elements	
Concept	**Detail**
Reduce input costs	Energy (power, fuel, machinery efficiency)
	Chemicals
	Labor
Maintain/enhance land production capacity	Soil health
	Water systems and moisture management
	Nutrient Management
	Pest Management
	New technologies
Flexibility to respond to market conditions	Changing land in production
	Individual schedule for implementing farming practices
	Cropping choices
Incentives	Payment for implemented conservation measures
	Tax breaks
	Reduction in unfunded mandates
	Simplification of rules/regulations
Managed farmland conversion	Urban development
	Maintaining resource lands
	Maintain stable water resource base
	Agricultural access to public lands
"No surprises" regulatory environment	Clean Water Act, Clean Air Act, Endangered Species Act, and others
	County permitting
Protect private property rights	Recognizing and respecting rights
Environmental variation	Rainfall amount and timing, temperature, and other climate factors
	Wildfires
	Floods
	Wildlife Impacts

Okanogan County is unique in location, growing climate, and agricultural diversity enabled through its location along the east slopes of the Cascade Mountain Range in Washington State with many valleys, terraces, and access to supplemental irrigation water. These are all important factors in considering agricultural viability. The strengths, weaknesses, opportunities, and threats associated with the County's landscape, climate, and rural demographics are summarized in Table 3-3.

Table 3-3 Agricultural Viability Strengths, Weaknesses, Opportunities, and Threats

Strengths	Weaknesses
• Growing climate • Abundant, cheap electricity • Current Comprehensive Plan contains viable land use policies that are not over regulatory (This could change since it is now under review) • Okanogan County Right to Farm Ordinance	• Distance to markets • Incentivizing younger generations to farm • Potential threats due to export markets • Lack of new water rights • Lack of natural resource management on Government lands • Stable, affordable labor supply
Opportunities	**Threats**
• Agritourism • New technologies such as precision agriculture • Increased expansion of high value crops	• Loss of small-acre farms • Vertical integration of food production systems • Global market instability • Government land acquisitions • Loss of PILT and SRS • Court Rulings/legislation • High Agricultural Tariffs in foreign markets

Overall, the Work Plan has been designed to support and promote the regional and individual farm agricultural viability elements listed above. The voluntary program places emphasis on systems, suites of practices, flexibility, incentives, volunteerism, and other opportunities mutually beneficial to agricultural viability and critical areas protections. Protecting and enhancing agricultural viability will continue to be a key performance measure that must be met during plan implementation.

In this Work Plan, emphasis is placed on implementing conservation practices through a systematic, site specific approach that maximizes voluntary protection and enhancement of critical areas while enhancing agricultural viability. These systems are a suite of farming practices, applied by crop/land use type, that target multiple agricultural viability concerns, including water, nutrient, pest, and residue management. Practice suites designed and implemented by producers must consider the cost of installation, cost of maintenances, changes in management which may affect labor usage and costs, and the ability of the suite of practices to protect or improve critical areas.

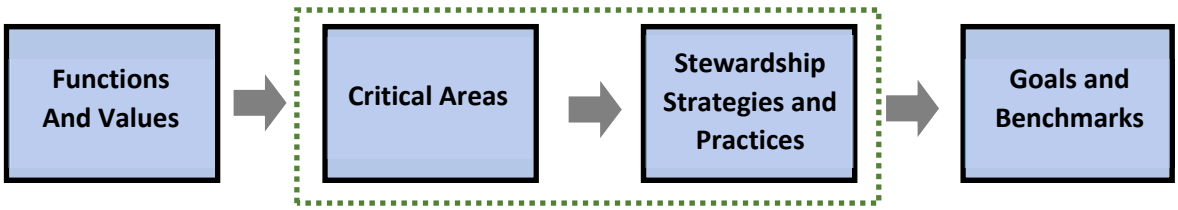
An important aspect of agricultural viability is the importance of operating and maintaining existing conservation practices/systems to achieve long-term benefits and minimize recidivism, or practices that are discontinued over time. The continued operation of existing conservation practices and systems 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 conservation practices and systems or establish new ones. As described in this Work Plan, voluntary conservation practices have the potential to benefit multiple resources, including agricultural viability and critical areas.

4 Voluntary Protection Strategies

Agricultural producers play a major role in the stewardship and management of private lands and resources within Washington State and Okanogan County. Agricultural producers are continually improving agricultural practices, applying new science and technology, and implementing stewardship projects that reduce agricultural impacts on critical areas. Various stewardship practices are implemented to address the major resource concerns within the County, including practices to improve irrigation efficiency, habitat, soil and water quality, and native rangeland plant communities. Overall, agriculture preserves lands from more intensive development, and, in addition, provides many opportunities to conserve and improve the environment. This Work Plan aims to maximize the application of voluntary stewardship activities in a way that protects and enhances critical areas.

By using available tools to examine the effects of stewardship practices on critical areas, measurable benchmarks can be designed to achieve protection and enhancement of critical area functions and values. 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 provide.

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



4.1 Examples of Stewardship Practices that Protect Critical Areas

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

Table 4-1 summarizes examples of stewardship practices that have been applied in the County via NRCS and Okanogan CD programs. This table helps illustrate the types of practices that have been or can be implemented to protect critical area functions. The truly important aspect of these practices is that these examples also address the promotion of agricultural viability.

Implementing a group, or suite, of agricultural stewardship practices is key to developing an effective conservation system on a farm or ranch. For example, irrigation water management practices realize the

most benefit for critical area protections and agricultural viability by implementing with nutrient and pest management practices. Similarly, applying the prescribed grazing practice is most successful to sustain a healthy plant community and optimal forage value if it works in conjunction with adequate livestock water and fencing to allow livestock rotation.

The VSP checklist has been developed for agricultural producers, Okanogan County and the Okanogan Conservation District, to determine how the VSP could apply to their operations. Appendix F provides a more comprehensive “toolbox” of example practices that have been or could be implemented by agricultural producers within Okanogan County.

Table 4-1 Examples of Critical Area Stewardship Practices in Okanogan County (Implemented by NRCS & OCD)

Example Practice	Applicability	Description	Critical Area Function		Agricultural Viability
Irrigation Water Management	Irrigated Croplands and Hay lands	Managing water volume, frequency, and application rate for efficiency and to decrease degradation of surface and groundwater resources	Water Quality	• Reduces runoff & erosion • Reduces transport of nutrients & 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	
Prescribed Grazing	Rangelands and Pastures	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic and management objectives.	Water Quality	• Reduces runoff & erosion • Reduces transport of nutrients & sediment	• Soil quality and conservation • Weed management • Yield and fertility
			Hydrology	• Increases infiltration & water availability	
			Soil	• Decreases water & wind erosion due to increased vegetation cover • Reduces stream erosion through enhanced riparian vegetation	
			Habitat	• Improves & maintains health & vigor of desired plant species • Restores desired habitats, such as shrub-steppe	
Nutrient Management	Drylands and Irrigated Hay lands and Croplands	Managing application of nutrients to minimize agricultural nonpoint source pollution of surface and groundwater resources while budgeting, supplying and conserving nutrients for plant production	Water Quality	• Reduces nutrients in surface & groundwater due to matching plant needs to the amount, timing, & placement of nutrients	• Soil quality • Yield and fertility • Reduced input costs
			Habitat	• Optimizes health & vigor of desired plant species • Increases food and cover for wildlife	
Residue and Tillage Management	Drylands and Irrigated Croplands	Managing crop and plant residue and limiting soil disturbance (e.g., no-till or reduced till)	Water Quality	• Reduces runoff & erosion • Reduces transport of nutrients & sediment	• Soil quality and conservation • Weed management • Yield and fertility
			Hydrology	• Increases infiltration & decreases evapotranspiration to increase water availability	
			Soil	• Reduces soil disturbance & increases cover to reduce wind and water erosion	

4.2 Existing Protections for Critical Areas

Agricultural operators are already subject to laws, regulations, industry standards, consumer demands, and public scrutiny related to environmental stewardship. Many of these provide implicit protection of critical area functions and values.

4.2.1 Laws and Regulations

The VSP does not remove the obligations for agricultural operators to comply with existing federal, state, and local laws and regulations. There are many existing laws and regulations which apply to agriculture and protect the functions and values of critical areas. Examples of applicable laws include:

- Federal Clean Water Act
- Federal Endangered Species Act
- Federal Insecticide, Fungicide, and Rodenticide Act
- Confederated Tribes of the Colville Reservation Law and Order Code, Title 4: Natural Resources and the Environment[1]
- Water Pollution Control Act (90.48 RCW)
- Pesticide Application Act (17.21 RCW)
- Hydraulic Code (77.55 RCW)

Additionally, the VSP does not replace County flood hazard management regulations that maintain flood insurance eligibility and address health and safety. For a complete list of laws and regulations that apply to agriculture in Okanogan County, see Appendix A. In instances where agricultural operators are failing to comply with existing environmental laws and regulations, the outreach, education, and technical assistance strategies planned through VSP can help promote compliance through voluntary changes in management practices.

4.2.2 Market Demands

Many agricultural producers must comply with industry standards, certification requirements, or consumer demands before their products can be sold. In many cases, this involves adherence to environmentally friendly practices. Examples of certification programs include the Pacific Northwest Direct Seed Association's "Farmed Smart" program and the Global Good Agricultural Practices (G.A.P.) certification; Agricultural producers also face increasing questions from retailers and consumers regarding how their food is produced with respect to the environment.

[1] CCT code applies within the boundaries of the Reservation, and on CCT owned land outside of the Reservation.

4.3 Voluntary Stewardship Practices in Okanogan County

Agricultural producers in Okanogan County have been implementing stewardship practices with the original Conservation Districts and Soil Conservation Service (now NRCS) since the mid-1940's. Since 2011, producers have implemented stewardship practices that protect and enhance the functions and values of critical areas and promote agricultural viability through private projects, and projects funded by federal, state, and local governments. One of the key purposes of VSP is to leverage existing resources by relying on existing work and plans, private-sector activities, and government programs to achieve Work Plan goals (RCW 36.70A.700 (2).

The following sections summarize documented stewardships strategies and practices, implemented since 2011, that have protected and/or enhanced critical area functions and improved agricultural viability over baseline conditions. The common project types and number of units implemented were used to develop realistic goals and benchmarks for this Work Plan.

Baseline data of stewardship practices since the July 22, 2011 baseline were collected by an inventory of the practices implemented through NRCS programs, the various federal, state and non-government organization programs administered by the Okanogan Conservation District, and multiple local and regional conservation organizations operating in the County. Practices were generally categorized using NRCS conservation practice standards.

The documented practices represent only a subset of all the stewardship strategies and practices that have been implemented since 2011, because many agricultural producers implement practices independent of government programs. Accounting for these improvements would require extensive self-reporting and documentation processes that are not yet in place but will be encouraged through VSP.

Most of the practices implemented were through the following programs:

Natural Resource Conservation Service

- Environmental Quality Incentives Program (EQIP)
- Conservation Stewardship Program (CSP)
- Wildlife Habitat Improvement Program (WHIP)
- Agriculture Water Enhancement Program (AWEP)

Okanogan Conservation District

- Conservation Reserve Enhancement Program (CREP)
- Conservation Plans
- Water Quality Best Management Practices
- Irrigation Efficiencies
- Save Water Save Energy
- Wild-fire Recovery

Conservation projects have been implemented on close to 244,300 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, soil productivity and conserve resources.
- Prescribed grazing to improve vegetation management, manage weeds, reduce erosion, improve soil functions, improve plant community health and vigor, and improve water quality.
- Wildlife habitat improvement from tree/shrub plantings, restoring and managing rare and declining habitats, and seeding grass and forbs.

Stewardship practices are being implemented to protect critical areas in all regions of the County but are relatively more common in the Methow and Okanogan Valleys, where more fire recovery projects were completed. The Methow and Okanogan Rivers also have a greater number of ESA listed species and programs directed towards their protection compared to the watersheds in eastern Okanogan County. Watershed-scale implementation information is summarized in Appendix E.

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

Along with stewardship of natural resources, self-reliance, personal privacy, and private property rights are important among Okanogan County farmers and ranchers. As a result, many stewardship practices are implemented without participation in grant programs or any sort of formal record-keeping. A Conservation Plan is one of the best ways to document stewardship activities occurring on a farm or ranch.

4.3.1 NRCS Conservation Practices

Table 4-2 provides a summary of number and acreages of top NRCS practices implemented in Okanogan County. NRCS programs are primarily funded through the Farm Bill, and guided by national and state-level priorities. VSP definitions control whether a stewardship 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 stewardship practices or projects installed since 2011 were designed to improve functions they should generally be counted as enhancements. Some of the practices had much higher implementation rates in 2015 and 2016 associated with recovery from the Okanogan and Carlton Complex fires, particularly prescribed grazing and livestock fencing.

Table 4-2 Top NRCS Conservation Practices Implemented from July, 2011 to 2016

Conservation Practice	Amount		Number of Projects	Agriculture Activity	Functions			
					Water Quality	Hydrology	Soil Health	Habitat
Prescribed Grazing	186,941	acres	89	Rangeland	X	X	X	X
Irrigation Water Management	2,672	acres	79	Irrigated	X	X		
Sprinkler System	1,788	acres	66	Irrigated	X			
Nutrient Management	2,377	acres	69	Dryland Irrigated	X		X	
Integrated Pest Management	18,476	acres	92	Dryland Irrigated Rangeland	X		X	
Upland Wildlife Habitat Management	12,830	acres	19	Dryland Irrigated Rangeland				X
Restoration and Management of Rare and Declining Habitat	956	acres	32	Dryland Irrigated Rangeland				X
Tree/Shrub Establishment	288	acres	42	Dryland Irrigated Rangeland				X
Conservation Cover	105	acres	3	Dryland Rangeland	X	X	X	X
Livestock Pipeline	96,879	feet	54	Rangeland	X			
Livestock Fence	242,831	feet	73	Rangeland				X
Irrigation Water Conveyance Pipeline	50,431	feet	25	Irrigated	X			
Watering Facility	19	troughs	49	Rangeland	X			X
Spring Development	14	facilities	14	Rangeland	X			
Stream Crossing	5	crossings	5	Rangeland	X			X

Notes:

1. Includes projects implemented under the Environmental Quality Improvement Program, Wildlife Habitat Improvement Program, Conservation Stewardship, and Agricultural Water Enhancement Program. Source: NRCS data provided by Harold Crose with the Grant County Conservation District.
2. There was an increase in practice implementation after 2014 and 2015 fires. Goals and benchmarks will be adjusted to be a more realistic amount.

4.3.2 Conservation District-led Projects

Numerous projects have been implemented across Okanogan County through the Okanogan CD since July, 2011. These are often funded directly by the Okanogan CD or through programs administered by other agencies. Approximately 3,620 acres had enhancement practices applied directly to them, and many more acres or miles of stream benefited from practices such as enhancing fish screens on irrigation pumps from the Okanogan River. Table 4-3 provides a summary of top Okanogan CD projects. Okanogan CD provides a range of technical and financial assistance based on priorities established by the Okanogan CD Board and

the objectives and goals set in prior Okanogan and Methow Watershed Water Quality and Quantity Plans. The Okanogan CD 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 area functions.

Table 4-3 Top Okanogan CD Conservation Practices Implemented from July, 2011 to 2016

Conservation Practice	Amount		Number of Projects	Type of Activity
Critical Area Planting	3,317	acres	11	Streambank plantings for bank stabilization providing improved water quality & wildlife habitat
Stream Habitat Improvement	9,000	feet	2	Gravel & woody material enhancement for aquatic organism health & vigor
Fish Screen	98	screens	70	Irrigation Pump Screens for aquatic organism protection
Stream Crossing	3	crossings	3	Bridge, drivable dips for Water Quality & Fish Passage
Livestock Water Well	9	facilities	8	Rangeland livestock management to improve plant community health & vigor
Livestock Fence	162,544	feet	31	Rangeland livestock management to improve plant community health & vigor
Integrated Pest Management	2,223	acres	Multiple, county-wide	Noxious Weed Control on Rangeland for habitat
Animal Mortality Facility	2	facilities	2	Water Quality
Cover Crop	80	acres	5	Cropland Soil Quality, water quality
Dike	4,450	feet	13	Home Protection & Stream Channel Management

Notes:

1. There was an increase in practice implementation after 2014 and 2015 fires. Okanogan CD had special funding after the fires. Goals and benchmarks will be adjusted to be a more realistic amount.

4.3.3 Other Programs

There are additional conservation programs, entities, and agencies 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. Producers have partnered with several other government and non-government organizations to plan and implement stewardship projects, particularly related to salmon recovery goals in the County. Fish passage improvements, riparian planting, and stream bank stabilization are some of the common project types.

Through large and small irrigation upgrades, purchases or water leases, producers make significant contributions to improving stream flow for fish. Between 2,000 and 3,500 acre-feet of water each year is managed for in-stream flow improvements by Washington Water Trust. Additional in-stream flow projects are facilitated by Trout Unlimited, the Yakama Tribes, and the Colville Confederated Tribes.

Technical assistance is available to agricultural producers through the Washington State University Extension. Additional technical assistance and stewardship programs and incentives are also provided through Farm Service Agency (FSA), Washington Department of Fish and Wildlife (WDFW), Washington State Department of Ecology (Ecology), Methow Salmon Recovery Foundation, Methow Conservancy, Cascade Columbia Fisheries Enhancement Group, and the Okanogan Highland Alliance (OHA) and others. A more complete list of conservation related agencies and organizations can be found in Appendix A.

4.3.4 Continuing Participation in Stewardship Programs

There is sufficient value in noting the good stewardship work done by the agricultural producers of Okanogan County between 1997 and 2010 via the NRCS and Okanogan CD. Stewardship practices were applied that addressed natural resource concerns on approximately 143,509 acres of farm and ranch lands in the County. Though this does not add to the 2011 to 2016 baseline of documented stewardship practices applied it does show that the agricultural producers in Okanogan County are serious about protecting and enhancing critical areas.

Participants in NRCS and Okanogan CD stewardship programs commit to maintaining their projects for set life spans as determined by NRCS. These lifespans can only be met with regular operation and maintenance of the applied or installed practice. Applying stewardship practices is a continuous effort because good stewardship itself is a continuous process as agricultural technology advances.

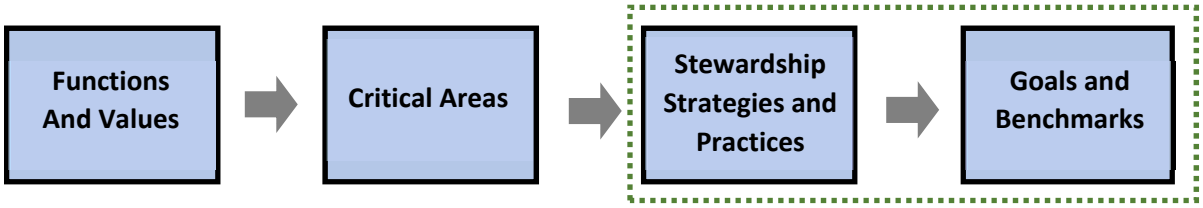
5 Goals and Benchmarks

The Voluntary Stewardship Program statute states that the Work Plan must:

> *"Create measurable benchmarks that, within ten years after the receipt of funding, are designed to result in (i) the protection of critical area functions and values and (ii) the enhancement of critical area functions and values through voluntary, incentive-based measures;"*

Goals are overall desired outcomes related to protection and enhancement of critical areas and maintenance of agricultural viability. **Benchmarks** are levels of voluntary participation and practice implementation that, when measured over time, will be used to determine if the Okanogan County VSP is achieving protection and enhancement of critical areas and maintaining agricultural viability.

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



5.1 Overall Protection and Enhancement Goals

Overall Goal 1: Protect critical areas through voluntary measures

This Work Plan must demonstrate how Okanogan County will protect critical areas with regard to agricultural activities. Using the definition in the VSP legislation,

*'Protect' or 'protecting' means to prevent the degradation of functions and values existing as of July 22, 2011." (*RCW 36.70A.703)

The terms "protection" and "degradation" in the context of critical areas and agricultural activities were interpreted in the Washington State Supreme Court's SWINOMISH INDIAN TRIBAL COMMUNITY v. Western Washington Growth Management Hearings Board, No. 76339-9 (Wash. Sept. 13, 2007). The 2011 VSP statute operates on the court's protection standard of "no new harm" to critical areas, and sets the baseline critical area condition as the conditions existing as of July 22, 2011. The statute also states that these protection standards are to be satisfied at the aggregate or "watershed scale." The VSP statute encourages but does not require enhancement of critical areas above and beyond the 2011 baseline conditions. Although this plan is designed to maximize voluntary protection measures to the extent that critical area enhancements will likely occur, it is only required to prevent new harm to the critical area conditions that existed on July 22, 2011.

Overall Goal 2: Enhance critical areas through voluntary measures

Promote participation in voluntary natural resource conservation practices to improve the processes, structure, and functions existing as of July 22, 2011, of ecosystems and habitats associated with critical areas.

Overall Goal 3: Maintain and Enhance the Viability of Agriculture in Okanogan County

The Okanogan County VSP Work Plan includes additional goals and performance metrics to demonstrate that agricultural viability is maintained.

5.2 Critical Area Protection and Enhancement Goals

The goals for protection and enhancement of critical area functions and values are organized by critical area type. In general, the requirement to *protect* and *enhance* is addressed by meeting benchmarks that *maintain* or *increase* levels of voluntary stewardship implementation. While the main focus of VSP is to ensure no net loss of critical areas in reference to the 2011 baseline, the program does encourage enhancement of critical areas. Enhancement will be sought through increase participation in VSP above plan goals to protect critical areas. If particular problem areas are identified, adaptive management strategies will be used to achieve enhancement goals.

When applied voluntarily, the stewardship practices described in the following goals protect critical areas and benefit agricultural production, profitability and sustainability. For example, many key practices have ancillary benefits such as reducing input costs, improved soil health and productivity, and protecting land from erosion and flood impacts. Financial incentives help to offset the costs of new and updated infrastructure.

The following protection objectives and key practices were developed based on best management practice recommendations in regional watershed plans, species recovery planning, and habitat management recommendations. For example, objectives to improve in-stream flows in the Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan (2007) includes the habitat improvement action of implementing irrigation efficiency projects. The plan recognizes the importance of agriculture to the region and encourages water management recommendations that do not impact agricultural production. Off-stream watering facilities and rotational grazing are also practices supported in the Recovery Plan and are included as a stewardship practice in the VSP Work Plan. Agricultural stewardship practices are reiterated in more detailed, sub-watershed fish habitat restoration plans throughout the County.

5.2.1 Wetland Goals

<table>
<tr><td colspan="3">Goal 1: Protect / Enhance Wetland Functions and Values
At the watershed scale and in relation to agricultural activities, prevent degradation and promote voluntary enhancement of wetland functions and values existing as of July 22, 2011.</td></tr>
<tr><td colspan="3">Key Functions and Values</td></tr>
<tr><td>Water Quality</td><td colspan="2">• Erosion control, the reduction of siltation.
• Reduction of surface water pollution through filtration.
• Shade provides temperature control.</td></tr>
<tr><td>Hydrology</td><td colspan="2">• Flood storage, moderating surface and storm water flows.
• Areas of recharge and discharge for lakes and groundwater.</td></tr>
<tr><td>Habitat</td><td colspan="2">• Prime habitat for aquatic, terrestrial, and avian species.</td></tr>
<tr><td colspan="3">NOTE: The presence of wetlands and the existence of these functions and values must be verified on a site-by-site basis.</td></tr>
<tr><td>Protection Objective</td><td>Key Practices</td><td>Existing Plans and Data</td></tr>
<tr><td>Promote participation in voluntary practices that protect and/or enhance wetland water quality improvement functions.</td><td>• Nutrient Management
• Pest Management
• Residue and Tillage Management
• Critical Area Planting
• Fence
• Prescribed Grazing</td><td rowspan="3">• Okanogan Watershed Plan
• Lower Okanogan River Basin DDT and PCBs Total Maximum Daily Load[1]
• Methow Watershed Plan
• Methow Restoration Plan of the Methow Restoration Council</td></tr>
<tr><td>Promote participation in voluntary practices that protect and/or enhance the water storage and recharge functions of wetlands.</td><td>• Irrigation Water Management
• Wetland Enhancement
• Mulch/Reduced Till</td></tr>
<tr><td>Promote participation in voluntary practices that protect and/or enhance the habitat functions of wetlands.</td><td>• Watering Facilities
• Managed Grazing
• Access Control
• Conservation Cover
• Wetland Wildlife Habitat Management</td></tr>
<tr><td colspan="3">Effectiveness Monitoring: Aerial imagery analysis detailed in Appendix I, and Table 6-2.</td></tr>
</table>

Notes:

1. DDT (Dichlorodiphenyltrichloroethane) is a contaminant which was used as an insecticide. PCBs (polychlorinated biphenyls) were used mostly in heat transfer fluids in electrical transformers and capacitors, but also as plasticizers, wax and pesticide extenders, and lubricants. Caulk that seals cracks in buildings used to contain PCBs at high levels (WA Ecology, 2018)

5.2.2 Fish and Wildlife Habitat Conservation Area Goals

<table>
<tr><td colspan="3">Goal 2: Protect / Enhance FWHCA Functions and Values
At the watershed scale and in relation to agricultural activities, prevent degradation and promote voluntary enhancement of FWHCA functions and values existing as of July 22, 2011.</td></tr>
<tr><td colspan="3">Key Functions and Values</td></tr>
<tr><td>Water Quality</td><td colspan="2">• Sediment filtration and pollutant removal
• Temperature control from shade
• Improve dissolved oxygen levels</td></tr>
<tr><td>Hydrology</td><td colspan="2">• Water storage and transport, retention of base flows.</td></tr>
<tr><td>Habitat</td><td colspan="2">• Provide primary habitat for aquatic, avian, and terrestrial species.
• Support life cycle of species designated as endangered, threatened, or sensitive (common loon, lynx, fisher, gray wolf, anadromous salmonids, etc.).</td></tr>
<tr><td>Protection Objective</td><td>Key Practices</td><td>Existing Plans and Data</td></tr>
<tr><td>Promote participation in voluntary practices that protect and enhance surface water quality.</td><td>• Nutrient Management
• Pest Management
• Residue and Tillage Management
• Critical Area Planting
• Fence
• Filter Strip
• Pond</td><td rowspan="3">• Okanogan Watershed Plan
• Lower Okanogan River Basin DDT and PCBs Total Maximum Daily Load
• Methow Limiting Factors Analysis
• Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan</td></tr>
<tr><td>Promote participation in voluntary practices that improves water conveyance efficiency and water conservation strategies.</td><td>• Irrigation Management
• Sprinkler systems
• Irrigation Pipe
• Forest Health Improvements</td></tr>
<tr><td>Promote participation in voluntary practices that enhance upland and aquatic habitats for terrestrial, avian, and aquatic species.</td><td>• Upland Wildlife Habitat Management
• Watering Facilities
• Managed Grazing
• Stream Habitat Improvement
• Fish screening</td></tr>
<tr><td colspan="3">Effectiveness Monitoring: Aerial imagery analysis and agency monitoring as detailed in Appendix I, and Table 6-2.</td></tr>
</table>

5.2.3 Critical Aquifer Recharge Area Goals

<table>
<tr><td colspan="3">Goal 3: Protect / Enhance CARA Functions and Values
At the watershed scale and in relation to agricultural activities, prevent degradation and promote voluntary enhancement of CARA functions and values existing as of July 22, 2011.</td></tr>
<tr><td colspan="3">Key Functions and Values</td></tr>
<tr><td>Water Quality</td><td colspan="2">• Aquifers used for potable water.</td></tr>
<tr><td>Hydrology</td><td colspan="2">• Recharges groundwater resources.</td></tr>
<tr><td>Protection Objective</td><td>Key Practices</td><td>Existing Plans and Data</td></tr>
<tr><td>Promote participation in voluntary practices that protect and enhance groundwater quality and prevent contamination of drinking water.</td><td>• Nutrient Management
• Pest Management
• Herbaceous Weed Control</td><td rowspan="2">• Washington State Department of Health Well Testing Information
• Duck Lake Ground Water Management Subarea
• WA Dept. of Ecology Critical Aquifer Recharge Area Guidance</td></tr>
<tr><td>Promote participation in voluntary practices that protect and enhance the groundwater recharge functions of critical aquifer recharge areas.</td><td>• Irrigation Management
• Sprinkler systems
• Water rights</td></tr>
<tr><td colspan="3">Effectiveness Monitoring: Communication with Okanogan County Public Health regarding drinking well water quality and groundwater contamination. See Table 6-2 on page 69.</td></tr>
</table>

5.2.4 Frequently Flooded Area Goals

<table>
<tr><td colspan="3">Goal 4: Protect / Enhance Frequently Flooded Area Functions and Values
At the watershed scale and in relation to agricultural activities, prevent degradation and promote voluntary enhancement of FFA functions and values existing as of July 22, 2011.</td></tr>
<tr><td colspan="3">Key Functions and Values</td></tr>
<tr><td>Water Quality</td><td colspan="2">• Vegetation in FFA's holds soil in place and provides area for new sediment depositions to settle out
• Moderates water temperatures by shallow groundwater infiltration</td></tr>
<tr><td>Hydrology</td><td colspan="2">• Temporary flood storage and conveyance.
• Groundwater recharge</td></tr>
<tr><td>Soil Health</td><td colspan="2">• Potential for soil erosion during flood events based on soil characteristics and vegetative conditions. Soil building in areas of deposition of sediment fines.</td></tr>
<tr><td>Habitat</td><td colspan="2">• Provides aquatic and riparian habitats for wildlife, plants and fish.</td></tr>
<tr><td>Protection Objective</td><td>Key Practices</td><td>Existing Plans and Data</td></tr>
<tr><td>Promote participation in voluntary practices that limits soil compaction or trampling of habitat.</td><td>• Nutrient Management
• Pest Management
• Access Control
• Managed Grazing</td><td rowspan="3">• Floodplain Management (86.16 RCW)
• Methow Restoration Plan
• Methow Limiting Factors Analysis
• Okanogan Watershed Plan
• Lower Okanogan River Basin DDT and PCBs Total Maximum Daily Load
• USDA Web Soil Survey Flood Classifications and Soil Erodibility Information</td></tr>
<tr><td>Promote participation in voluntary practices that protect and enhance the flood storage and conveyance functions.</td><td>• Stream channel maintenance & improvement</td></tr>
<tr><td>Promote participation in voluntary practices to protect and enhance soil health and prevent soil erosion during flooding events.</td><td>• Streambank and shoreline protection
• Cover Crop
• Watering Facility
• Access Control
• Stream Habitat Improvement and Management.</td></tr>
<tr><td colspan="3">Effectiveness Monitoring: Aerial imagery analysis detailed in Table 6-2 on page 69, Appendix I</td></tr>
</table>

5.2.5 Geologically Hazardous Area Goals

<table>
<tr><td colspan="3">Goal 5: Protect / Enhance Geologically Hazardous Area Functions and Values
At the watershed scale and in relation to agricultural activities, prevent degradation and promote voluntary enhancement of GHA functions and values existing as of July 22, 2011.</td></tr>
<tr><td colspan="3">Key Functions and Values</td></tr>
<tr><td>Water Quality</td><td colspan="2">• Risk of deposition of sediment in waterways due to erosion or mass failure of geologically hazardous areas.</td></tr>
<tr><td>Soil Health</td><td colspan="2">• Potential for erosion or mass movement due to soil composition and vegetative conditions.</td></tr>
<tr><td>Protection Objective</td><td>Key Practices</td><td>Existing Plans and Protections</td></tr>
<tr><td>Promote participation in voluntary practices that protect and enhance surface water quality and limit movement of sediment and other materials into water bodies.</td><td>• Irrigation Water Management
• Access Control
• Managed Grazing</td><td rowspan="2">• Okanogan Watershed Plan
• Lower Okanogan River Basin DDT and PCBs Total Maximum Daily Load
• USDA Web Soil Survey Flood Classifications and Soil Erodibility Information</td></tr>
<tr><td>Promote participation in voluntary practices to protect and enhance soil health and prevent soil erosion on steep slopes.</td><td>• Cover Crop
• Access Control
• Managed Grazing
• Tree/Shrub Establishment
• Conservation Cover</td></tr>
<tr><td colspan="3">Effectiveness Monitoring: Aerial imagery analysis detailed in Table 6-2.</td></tr>
</table>

5.3 Participation Benchmarks for Critical Areas Protection

The following methodology was used to set participation benchmarks:

- Connect practices to critical area functions and values
- Inventory historic participation through implementation of stewardship practices
- Set participation benchmarks based on estimated annual disenrollment from implemented practices

Participation benchmarks are based on quantifiable rates of stewardship practice implementation. Benchmarks to measure critical area protection and enhancement are based on a 'no net loss' protection objective. Table 5-1 outlines the key stewardship practices which can be implemented to protect critical areas. Measurable protection and enhancement benchmarks were developed for all practices, with the exception of conservation easements and trusted water, which are enhancement practices only.

The rate of participation by individuals will not be set as a participation benchmark. Okanogan County has some of the largest farms in the state and stewardship practice participation benchmarks may be achievable by working with few individuals.

5.3.1 Connecting Practices to Critical Area Functions

Stewardship practices by agricultural operators have direct and indirect effects on multiple functions of critical areas, as described in Section 4. Practices were associated with beneficial impacts to critical area functions using the NRCS Conservation Practices Physical Effects (CPPE) tool. CPPE scores range from 5 to -5, with positive scores denoting a beneficial effect, and negative scores having an adverse effect. The CPPE was used to identify the key practices that were incorporated into the participation benchmarks. Input from technical partners were also important in identifying key practices. Stewardship practices were then grouped into six 'Management Types', based on their primary on-farm application: soil management; water management; nutrient management; pest management; range management, and habitat management.

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 G. 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.

5.3.2 Inventory of Participation in Stewardship Practices

An inventory of agricultural stewardship practices implemented between 2011 and 2016 was conducted to develop the participation benchmarks. The participation data includes practices applied with assistance from the Natural Resources Conservation Service, Okanogan Conservation District, Okanogan Land Trust, Methow Conservancy, Methow Salmon Recovery Foundation, Trout Unlimited, and Okanogan County Public Works. For consistency, the stewardship practices are identified by NRCS practice codes, although they are not necessarily funded and implemented through NRCS programs. Stewardship practices with beneficial CPPE scores (positive impacts on critical area functions) were selected for protection benchmarks. Annual average enrollment was calculated from 2011-2016 data to guide realistic target participation levels for 2021 and 2026.

5.3.3 Setting Participation Benchmarks based on Estimated Disenrollment

In order to maintain no net loss of critical areas functions and values, participation benchmarks were set to account for anticipated annual disenrollment from stewardship practices since 2011 (Table 5.1). A certain percentage of agricultural operators who enroll in stewardship practices decide to remove or discontinue those practices in the future. Disenrollment rates for this work plan are based on rates developed through the Grant County VSP Work Plan. Practices that are easier to remove or discontinue, such as nutrient management or cover crops, have a disenrollment rate of approximately 6%. For more permanent practices such as watering facilities, a rate of 3% is more likely. Disenrollment rates were applied to the average annual stewardship practice implementation amount to generate an estimate of annual disenrollment. In order to achieve the no net loss objective, new practice implementation must keep pace with the annual disenrollment (amount of practices discontinued). Target participation levels for 2021 and 2026 are based on the 2011 baseline, and were calculated to keep pace with disenrollment anticipated over 10 and 15 years, respectively.

5.3.4 Types of VSP Participation

Success of the VSP relies on participation or communication with Okanogan County agricultural operators and technical assistance providers. The benchmark participation levels are based on data gathered from existing stewardship programs. Additional stewardship activities occur voluntarily, without program enrollment.

Direct Participation:	Engage in stewardship practices directly facilitated by VSP checklist.
Indirect Participation:	Participate in existing stewardship programs. Data tracked by VSP.
Non-participation:	This includes people who do not participate in any type of formal stewardship or conservation program. This work plan aims to open the door for non-participants to voluntarily report their existing stewardship practices or engage in new practices, thus transitioning to one of the above participation categories.

Table 5-1 Voluntary Protection Benchmarks

Stewardship Strategies			Historic Okanogan County Installed Practices			Participation Benchmarks- Protection			Enhancement	
Management Type	**NRCS Code**	**Key Stewardship Practices**	**Practice installed (2011-2016)**	**Average Annual Implementation**	**Estimated Annual Disenrollment [1]**	**Objective**	**2021 Target Participation[2]**	**2026 Target Participation[2]**	**2021 Objective**	**2026 Objective**
Soil Management	328 340 329 484	Conservation Crop Rotation Cover Crop Residue and Till Management, No Till Mulching	2,261 ac	452 ac	27 ac (6%)	No net loss of acres/feet of Soil management practices	270 ac	405 ac	Focus and maximize voluntary incentive programs to achieve participation beyond 2021 target levels.	Focus and maximize voluntary incentive programs to achieve participation beyond 2026 target levels.
Water Management	449 442 533	Irrigation Water Management Sprinkler System Pumping Plant	4,563 ac 30 each	913 ac 6 each	27 ac (3%) 0.18 each (3%)	No net loss of acres managed under water conservation practices	270 ac 1 each	411 ac 2 each		
Nutrient Management	590 317 316	Nutrient Management Composting Facility Animal Mortality Facility	2,377 ac 3 facility	475 ac 0.6 facility	29 ac (6%) 0.04 facility (6%)	No net loss of acres under nutrient management	285 ac	428 ac 1 facility		
Pest Management	595	Integrated Pest Management	18,476 ac	3,695 ac	222 ac (6%)	No net loss of acres managed under pest & weed control practices	2,220 ac	3,330 ac		
Range Management	528 516 614 574 560 472 561	Range Planting Prescribed Grazing Watering Facility Spring Developments Access Road Access Control Heavy Use Protection Area	188,769 ac[4] 118 each 616 ft	5,840 ac[4] 24 each 123 ft	350 ac (6%) 0.81 each (3%) 7 ft (6%)	No net loss of acres/ft or loss in number of facilities	3,500 ac 7 each 70 ft	5,256 ac 106 each 105 ft		
Habitat Management	327 342 395 612 643 645	Conservation Cover Critical Area Planting Stream Habitat Improvement Channel Stabilization Tree/Shrub Establishment Restoration of Rare and Declining Habitats Upland Wildlife Habitat Management	29,404 ac 29 mi	5,881 ac 5.8 mi	176 ac (3%) 0.17 mi	No net loss of acres managed under wildlife habitat practices or loss of structures for wildlife	1,760 ac 1.7 mi	2,640 ac 2.5 mi		
	734	Fish and Wildlife Structure	10 structure	2 structure	0.06 each (3%)		1 each	1 each		
		Fish Screens[6]	2 each *98 fish screen were done by OCD special funding	0.4 each	0.01 each (3%)		0	0		
	578	Culvert/Bridge/Stream Crossings Upgrades	22 each	4.4 each	0.013 each (3%)		0 each	1 each		
	NA	Conservation Easement[5]	7,163 ac.	1,432 ac	NA	Not Applicable- All new easements and trusts will be considered as Enhancements.			Easements and trusts are available voluntarily and new projects will be considered Enhancements.	
	NA	Water Trusted	15,003 ac ft	3,000 ac ft	NA					

Notes:

1. Annual disenrollment is estimated based on NRCS practice data since 2006. Practices that are easier to remove have 6% estimated annual disenrollment. Practices that are more difficult to remove have 3%. These disenrollment figures were adapted from the Grant and Whitman, Stevens County VSP Work Plans.
2. Target participation levels is the estimated annual disenrollment multiplied by 10 for 2021, and 15 for 2026, in order to implement projects at a pace that makes up for disenrollment since 2011.
3. Habitat Management has 27.1 mi fish habitat improvement. Measurements came from MSRF data which includes projects like reconnecting riparian areas and channels, plantings, enhancing side channels, removal of anthropogenic barriers, adding hardened rock crossings, etc.. 12,905 feet of habitat improvement was recorded by NRCS
4. Data includes 2015 and 2016 increase in Prescribed Grazing related to wildfire response. To avoid overestimating annual average, Annual Average Implementation was calculated from years 2011-2014 (21,989 ac/4) which more closely reflects long-term trend in data since 1997. Acreage also include
5. No protection benchmark is set for Conservation Easements or water trust/water saving. While it is likely participation will continue, funding for these programs is highly variable, and most conservation easements and water trusted was in perpetuity (annual disenrollment of 0).
6. Significant fish screen implementation has already been conducted for regulatory compliance related to endangered fish and wildlife.

*Practice data came from NRCS, OCD, Methow Conservancy, OLT, Okanogan County Public Works, MSRF, CCT, TU.

5.4 Agricultural Viability Goals and Benchmarks

RCW 36.70A.720 (1) states that the work plan must be developed to "protect critical areas while maintaining the viability of agriculture in the watershed." This section outlines goals for maintaining the viability of agriculture, based on the regional and farm viability elements described in Section 3. While these are not used to determine VSP compliance over time, the agricultural viability goals and benchmarks will help Okanogan County and technical service providers plan for resource lands and support the local agricultural community.

5.4.1 Agricultural Viability Goals

1. **Maintain a secure link between agricultural producers and agricultural land base.**
   For agriculture to remain viable in Okanogan County, adequate land must be available so that agricultural activities can be conducted at an economically worthwhile scale. Development and public acquisitions that converts land from agriculture to other uses should be minimized. Urbanization, rising land values, and taxation put increase pressure on rural agricultural landowners to convert land to other uses.
2. **Water resources necessary for producers are available and reliable.**
   Water needs to be available in sufficient quantities and at the right times in order to ensure viable agriculture in Okanogan County. Programs that promote agricultural access to water supplies, a stable and fair legal system to protect water rights, and provisions to secure water and improve water right reliability during times of drought are important components of a productive agricultural land base.
3. **Maintain and improve agricultural infrastructure and services.**
   In order for agriculture to remain viable in Washington State, the infrastructure that supports it must be in place and well maintained. Agricultural irrigation and drainage districts, utilities, processing facilities, transportation and port systems, and market access systems must remain accessible and affordable to the agricultural community.
4. **Maximize education and technical support for implementing best management practices.**
   The average age of an agricultural operator in Okanogan County is over 58 years old, and many operations are in the process of transitioning to the next generation of farmers and ranchers. Estate and succession planning is imperative to furthering the viability of agricultural operations. Many conservation practices, as set out by the Natural Resource Conservation Service and others, are supportive of agricultural viability. Through technical assistance provided by local conservation districts, WSU Extension and similar programs, farmers should be encouraged to institute conservation practices to ensure the continued capability of their land to produce crops and to conserve natural resources.
5. **Maintain a welcoming business environment for agriculture.**
   To maintain agricultural viability, state and local governments should look for opportunities to partner with the agricultural community on efforts and incentives to improve both agricultural viability and the natural environment. To reduce time and cost impacts, governmental regulations and permit processes affecting agricultural producers should be predictable, affordable and not overly burdensome.
6. **Private property rights are protected.**
   Maintaining the voluntary approach to environmental protection provides more flexibility and opportunity for agricultural producers than a regulatory approach.

5.4.2 Agricultural Viability Goals and Metrics

Viability Goal	Performance Objective	Performance Metrics
Maintain a secure link between agricultural producers and agricultural land base.	Agricultural practices continue to occur at similar or increasing levels.	Change in agricultural land cover.
	Permits and leases for crop lands and grazing allotments on federal and state lands are available at similar or increased levels.	Acreage data from state and federal agencies indicates no net loss and increased access to public lands for agricultural leases.
	Preservation mechanisms exist to maintain lands in agriculture.	Comprehensive planning and zoning encourages preservation of agricultural resources.
	Maintain Right to Farm Ordinance.	Right to Farm Ordinance in the County exists and agriculture is effectively protected from nuisance claims.
Water resources necessary for producers are available and reliable.	Water rights transfer assistance continues to exist.	Continued availability of water rights transfer assistance.
	Water rights are maintained within Okanogan County for agricultural use.	Educational opportunities related to maintaining active water rights are available.
Improved agricultural infrastructure and services	Agriculture-related businesses and services exist in the County.	Number of agriculture related businesses and services that exist.
Education and support for implementing best management practices.	Availability of such education, technical resources, programs and events.	Number of available resources, programs and events.
A welcoming business environment with flexibility for agriculture operators.	Improved understanding between agricultural operators, the public and agency personnel.	Number of forums and meetings to discuss key issues in a cooperative manner. Educational opportunities for agency staff are available (farm tours, workshops).
	Implementation of flexible site-specific solutions to address critical areas issues.	Number of practices that are permitted and included in incentive programs.
	Farming remains economically viable and productive.	Number of farms operating in Okanogan County.
Protect private property rights	Voluntary approaches are used for environmental protection, rather than regulatory approaches.	Participation in stewardship practices and programs remain voluntary.

Regarding increasing the level of agriculture, the Work Group encourages the use of appropriate stewardship practices in critical areas, especially to maintain functions and values of wetlands, geologically hazardous areas or riparian zones.

5.4.3 Strategies for Encouraging Agricultural Viability Elements

In addition to the goals and objectives which will be used to measure and assess agricultural viability, several action items have been identified to improve regional and farm elements related to agricultural viability. The following strategies can be utilized to guide organizations and agencies to better support the agricultural economy in Okanogan County.

Maximize economic value for Okanogan County Agricultural products and income potential for agricultural activities.

- Take advantage of marketing incentives/programs for Okanogan County products.
- Promote options for agritourism, with consideration of concerns relative to Global GAP compliance.
- Advocate for diverse land use activities to be permitted on agricultural lands.

Facilitate an adequate supply of labor.

- Advocate for expedited guest worker visas, worker training, labor recruitment, and immigration reform to create local administrative and support services.
- Advocate for an affordable labor force.

Ensure accessibility of technical assistance providers who are knowledgeable about the needs of the Okanogan County agricultural community.

- Advocate for staffing of local conservation district and NRCS personnel with expertise in Okanogan County agricultural activities and crops.
- Advocate for ongoing investment in local research and consulting expertise, including WSU Extension resources.

Protect agricultural operators from losses due to human-made and natural disasters.

- Encourage operators to document and detail current asset values and model expected future production.
- Advocate for resources for disaster mitigation and recovery.

Maintain resilient agricultural production in the face of an aging agricultural community.

- Broaden availability of resources to support estate planning and increase implementation of estate planning practices.
- Advocate and encourage new and beginning farmers with targeted outreach, assistance programs, and other methods of support.

Maintain infrastructure to support agriculture.

- Advocate for new or improved "hard" infrastructure, including transportation, water and waste utilities, drainage systems, access to markets, processing facilities, and equipment.
- Develop and steward "soft" infrastructure systems, including human capital, community networks, labor, training and education, university and field research, technical assistance, and farm succession resources.
- Policy and regulatory measures that allow freedom to develop services and infrastructure diversity.
- Seek opportunities to access new water for agricultural use.

Control populations of noxious, nuisance, and pest species on agricultural lands.

- Advocate for special depredation permits and Master Hunter programs to address negative wildlife impacts on critical areas and agricultural lands.

- Advocate for pest and noxious species management protocols on adjacent lands, both public and private.
- Broaden awareness and increase implementation of Integrated Pest Management practices.
- Decrease production loss from wildlife damages (e.g. elk, unprotected geese, nutria, beaver).

Encourage cooperation and understanding between public agencies, the public and agricultural operators.

- Improve awareness of agricultural value to the land and the County economy.
- Encourage cooperatively developed grazing plans for public land which improve forage productivity.
- Encourage forest management protocols that improve forest health and increase productivity of range lands.
- Advocate for maintaining historic acreage available for grazing leases/permits on public lands.
- Encourage public agencies to maintain agricultural practices when private agricultural land is purchased.
- Advocate for agencies to provide technical assistance for project permitting.
- Encourage agencies seek alternatives to address environmental issues while keeping agricultural lands in private ownership.
- Encourage public agencies to increase acres and duration of public land available for agricultural use.

6 Monitoring and Adaptive Management

The VSP Work Group is responsible for overseeing the monitoring, reporting and adaptive management of Work Plan implementation. The Okanogan Conservation District will be the lead entity for providing technical assistance. RCW 36.70A.720 describes the schedule and actions the Work Group must follow during implementation of the plan. The benchmarks must be measurable and designed to protect critical area functions and values and the enhancement of critical areas functions and values through voluntary and incentive-based measures.

The monitoring and adaptive management process outlined in this plan is designed to evaluate whether the goals and benchmarks of this Work Plan are being met and establish a process for necessary adjustments to assure that goals are met in the future. The monitoring and adaptive management process aims to accomplish the following:

- Clearly identify the monitoring questions that need to be answered;
- Identify metrics that can be used to answer the questions on a repeatable basis;
- Describe how the metrics will be analyzed in a simple, repeatable way;
- Define the threshold for adaptive management;
- Identify the parties responsible for taking monitoring and adaptive management actions;

	Participation Monitoring	**Effectiveness Monitoring**
Monitoring Question:	Are voluntary stewardship practices being implemented at or above benchmark levels?	How are the functions and values of critical areas changing at the watershed scale in relation to agricultural activities?
Metrics:	• Stewardship practice data • VSP checklists • Education and outreach events.	Effectiveness Monitoring Indicator(s)
Adaptive management:	Site evaluations and additional outreach and education	Focused outreach related to identified critical area protection issues. Site evaluations to assess issue source.
Who is responsible:	Okanogan CD	Okanogan CD

6.1 Participation Monitoring

The VSP statute requires monitoring of participation activities, stewardship activities, and the associated implementation of voluntary stewardship plans and projects. This monitoring information will be used to evaluate participation benchmarks for protection and enhancement, and track outreach and engagement with agricultural producers. Participation monitoring will involve tracking the implementation of voluntary stewardship practices relevant to the protection and enhancement benchmarks established in Chapter 5. Participation monitoring will also include:

- Occurrence and number of participants at relevant educational events, workshops, forums, farm tours and any other events that assist, encourage or improve voluntary stewardship efforts in the county.
- Participation in VSP Stewardship Checklists (Appendix H).
- Participation in farm planning or conservation planning as indicated by Okanogan CD and NRCS records.
- Implementation of key stewardships practices documented by NRCS and Okanogan CD.

To evaluate engagement in VSP, adaptive management triggers for participation have been set for annual participation in outreach events (20 participants) and number of stewardship plans (3 participants). Individual participation rates are based on previous Okanogan CD events and planning. Participation will be summarized in reports to the County and the WSCC.

Table 6-1 outlines monitoring and adaptive management procedures for participation benchmarks.

6.2 Effectiveness Monitoring

The VSP statute requires monitoring of the effects on critical areas relevant to the protection and enhancement benchmarks set in the Work Plan. Effectiveness monitoring is used to assess the watershed-scale effects of agricultural activities by both VSP participants and non-participants on critical areas. This involves reviewing available data to assess critical area functions and values to see if voluntary stewardship efforts are achieving intended outcomes. The analysis of monitoring data is focused at the watershed scale. To protect landowner privacy, monitoring data will not be summarized or reported at the parcel scale, and is not to be used by any person or agency for regulatory purposes.

6.2.1 Effectiveness Monitoring Data

Effectiveness monitoring data is used to determine the need for adaptive management. Monitoring data sources were selected based on practicality, cost, availability, and relevance to key protection issues. Monitoring data sources and techniques may be added, adjusted, or removed as their usefulness becomes apparent or as new protection issues arise. New data sources and monitoring techniques must be approved by the VSP Work Group before they are incorporated into the monitoring process. See Table 6-2 and Appendix I for critical area-specific monitoring strategies.

Aerial imagery data will be used to assess landscape attributes that relate to critical area functions and values. This may include changes in the extent, character, or vegetation associated with a particular critical area. The analysis will incorporate publicly available aerial imagery and GIS data pertaining to critical areas and agriculture.

Analysis of aerial imagery will be conducted periodically based on available data and summarized at 5-year VSP reporting intervals.

Groundwater quality data will be used to monitor protection of the Critical Aquifer Recharge Area in Okanogan County. Local agencies, such as Okanogan County Public Health and municipalities,

already conduct groundwater monitoring within the CARA. This data can be examined to determine if degradations to groundwater quality are occurring. Monitoring will focus on incidents of groundwater degradation as reported by Washington State Department of Health or other agencies through their monitoring efforts within the CARA. Information on reported degradations will be collected and summarized on a watershed basis.

Additional data from outside monitoring programs may be obtained by technical staff and shared with the workgroup, including information collected by state and local monitoring programs. At periodic reporting intervals, technical staff may ask relevant agencies and groups to share watershed-scale monitoring information that pertains to critical area functions. The workgroup will review this information and determine how it relates to the goals and benchmarks of the VSP Work plan. The monitoring programs listed below are ongoing programs that have been utilized for the development of the Work Plan and will be reviewed for effectiveness monitoring.

On-the-ground stewardship planning with VSP participants and site assessments from stewardship checklists (when permitted by the land owner or manager) will be used to confirm stewardship practices are occurring to protect the functions and values of critical areas. This information will be characterized at the watershed scale for reporting purposes.

Organization/Agency	Monitoring Program
Washington Department of Ecology	• Watershed Health Monitoring • Trends in groundwater levels
Confederated Tribes of the Colville Reservation	• Okanogan Basin Monitoring and Evaluation Program • Surface water quality monitoring
WA Dept. of Fish and Wildlife	• Fish Barrier assessments • Habitat and Species status reviews • PHS maps
Okanogan County Public Health	• Well testing data

Details about these monitoring programs can be found in Appendix I.

6.2.2 Assisting Outside Organizations

The workgroup and VSP technical staff may provide available watershed-scale information and assistance to help state agencies align their monitoring efforts with VSP monitoring and the goals and benchmarks of the VSP Work Plan. Watershed-scale monitoring reports will be made available to VSP technical agencies.

As resources allow, VSP technical staff will assist agencies and organizations with on-going monitoring programs and new monitoring opportunities. Effectiveness monitoring will clarify the data gaps which should be addressed by additional monitoring protocols. Additional tools which increase effectiveness in monitoring may be considered.

6.3 Adaptive Management

Adaptive management consists of a monitoring and response system to evaluate progress towards participation benchmarks and critical areas protection. Participation and effectiveness monitoring data will be considered in relation to predetermined adaptive management thresholds or "triggers." If monitoring data indicates that an adaptive management trigger has been reached, an established response will be carried out to address the issue. If adaptive management triggers are not reached, the monitoring system will simply be repeated at the defined intervals.

Adaptive management triggers for participation are set at 120% of the protection requirement, so that management changes are proactive and address shortfalls before they occur. Adaptive management actions are non-regulatory processes such as further data analysis, revision of goals and benchmarks, or additional outreach and education with landowners. Adaptive management will be applied if the annual participation performance review indicates that stewardship practices are not being implemented at a rate that would protect critical area functions and values.

If adaptive management process is triggered, Okanogan County and the Okanogan Conservation District will review outreach, education programs, and incentive programs with local organizations to identify additional strategies for encouraging stewardship practice implementation. Many factors outside the scope of VSP can impact critical areas. The Work Group, Okanogan County and the Okanogan Conservation District will review participation and effectiveness monitoring to determine whether adaptive management triggers are due to usual agricultural activities or extraneous events. For example, flooding in 2018 along the Okanogan River may have impacted the baseline protections in place for frequently flooded areas and while every effort will be made to restore protective practices, this should not be held against the quantitative benchmarks.

Tables 6-1 and 6-2 provide a monitoring and adaptive management framework for employees implementing the work plan. Additional worksheets and forms to assist in monitoring and reporting may be developed in the future and will be attached to the Work Plan.

If the participation and effectiveness monitoring methods outlined in this Work Plan are not able to track agricultural viability indicators or demonstrate whether critical areas are being protected, the County, the Conservation District, and the Work Group will consider alternative monitoring methods.

6.3.1 Failure of the Work Plan

If the Work Plan is not approved, fails or is unfunded, RCW 36.70A.735 defines the County's options. The Work Group recommends the County to pursue option (1)(a). Within eighteen months after the Work Plan's goals and benchmarks for protection have not been met, the County must develop, adopt and implement an adaptive management plan approved by the department that protects critical areas in areas used for agricultural activities while maintaining the viability of agriculture in the watershed. The County shall consult with the departments of agriculture, ecology, fish and wildlife and the commission and other relevant state agencies before seeking approval of the proposed adaptive management plan. Once the adaptive management plan is adopted, funding will be sought and additional voluntary measures will be implemented when funding is available.

RCW 36.70A.735

When work plan is not approved, fails, or is unfunded—County's duties—Rules.

(1) Within eighteen months after one of the events in subsection (2) of this section, a county must:

(a) Develop, adopt, and implement a watershed work plan approved by the department that protects critical areas in areas used for agricultural activities while maintaining the viability of agriculture in the watershed. The department shall consult with the departments of agriculture, ecology, and fish and wildlife and the commission, and other relevant state agencies before approving or disapproving the proposed work plan. The appeal of the department's decision under this subsection is subject to appeal under RCW **36.70A.280**;

(b) Adopt development regulations previously adopted under this chapter by another local government for the purpose of protecting critical areas in areas used for agricultural activities. Regulations adopted under this subsection (1)(b) must be from a region with similar agricultural activities, geography, and geology and must: (i) Be from Clallam, Clark, King, or Whatcom counties; or (ii) have been upheld by a growth management hearings board or court after July 1, 2011, where the board or court determined that the provisions adequately protected critical areas functions and values in areas used for agricultural activities;

(c) Adopt development regulations certified by the department as protective of critical areas in areas used for agricultural activities as required by this chapter. The county may submit existing or amended regulations for certification. The department must make its decision on whether to certify the development regulations within ninety days after the county submits its request. If the department denies the certification, the county shall take an action under (a), (b), or (d) of this subsection. The department must consult with the departments of agriculture, ecology, and fish and wildlife and the commission before making a certification under this section. The appeal of the department's decision under this subsection (1)(c) is subject to appeal under RCW **36.70A.280**; or

(d) Review and, if necessary, revise development regulations adopted under this chapter to protect critical areas as they relate to agricultural activities.

(2) A participating watershed is subject to this section if:

(a) The work plan is not approved by the director as provided in RCW **36.70A.725**;

(b) The work plan's goals and benchmarks for protection have not been met as provided in RCW **36.70A.720**;

(c) The commission has determined under RCW **36.70A.740** that the county, department, commission, or departments of agriculture, ecology, or fish and wildlife have not received adequate funding to implement a program in the watershed; or

(d) The commission has determined under RCW **36.70A.740** that the watershed has not received adequate funding to implement the program.

Table 6-1: Participation Monitoring and Adaptive Management Process

Management Type	NRCS Code	Key Stewardship Practices	Protection Metric[1] (Annual)	How to check metric	Adaptive Management Trigger (120% of Protection Metric)	Adaptive Management Action	Who Monitors	How Often
Soil Management	328 340 329 484	Conservation Crop Rotation Cover Crop Residue and Till Management, No Till Mulching	27 ac (6%)	Data from NRCS REAPData Team, Okanogan CD Files. 10% verified through visual recognition/landowner report	32 ac	Outreach with agricultural operators Review incentive opportunities with local agencies and organizations	Okanogan Conservation District	Annually
Water Management	449 442 533	Irrigation Water Management Sprinkler System Pumping Plant	27 ac (3%) 0.18 each (3%)	Data from NRCS REAPData Team, Okanogan CD Files. 10% verified through visual recognition.	32 ac 0.18 each			
Nutrient Management	590 317 316	Nutrient Management Composting Facility Animal Mortality Facility	29 ac (6%) 0.04 facility (6%)	Data from NRCS REAPData Team, Okanogan CD Files.	35 ac			
Pest Management	595	Integrated Pest Management	222 ac (6%)		266 ac			
Range Management	528 516 614 574 560 472 561	Range Planting Prescribed Grazing Watering Facility Spring Developments Access Road Access Control Heavy Use Protection Area	350 ac (6%) 0.81 each (3%) 7 ft (6%)	Data from NRCS REAPData Team, Okanogan CD Files. 10% verified through visual recognition.	420 ac 1 each 8 ft			
Habitat Management	327 342 395 NA 612 643 645	Conservation Cover Critical Area Planting Stream Habitat Improvement Channel Stabilization Tree/Shrub Establishment Restoration of Rare and Declining Habitats Upland Wildlife Habitat Management	176 ac (3%) 0.17 mi	Data from NRCS REAPData Team, Okanogan CD Files. 10% verified through visual recognition.	211 ac 0.20 mi			
	734	Fish and Wildlife Structure	0.06 each (3%)		0.07 each			
	NA 578	Fish Screens Culvert/Bridge/Stream Crossings Upgrades	0.01 each (3%) 0.01 each (3%)		0 0			
Enhancements		Conservation Easement Water Trusted	0 acres 0 ac ft	Data from partner organizations, Okanogan CD files		Inform agricultural producers about opportunities		
Additional Participation Monitoring								
Educational Opportunities related to stewardship of critical areas and agriculture	• Educational events • Workshops • Farm tours • Other forms of educational events and programs.		20 participants, annually Communicate with WSU, SCCD, Farm Bureau, and other stakeholders regarding what events have taken place.	Low participation, no events held	Consult stakeholder groups on what educational opportunities are needed. OCD and local organizations coordinate to provide more diverse opportunities.	Okanogan Conservation District	Annually	
Participation in Individual VSP Stewardship Checklists	Number Completed		No existing benchmark	Collect and review checklist participation, develop benchmark	Outreach with agricultural operators			
Participation in stewardship practice planning with Okanogan CD	Number of Plans		3 practice plans in 5 years	<1 plan in development	Outreach with agricultural operators		Annually	

Notes:

1. Protection Metrics are calculated based on annual practices required to meet benchmark values identified in Table 5-1
2. For partial metrics (for example, 0.06 Fish and Wildlife Structure), Okanogan CD will request information on planned projects from agricultural producers, technical agencies and organizations for their annual monitoring.

Table 6-2: Effectiveness Monitoring and Adaptive Management Process

Critical Area Function	Protection Objective	Indicator Source Data	Performance Indicator	Adaptive Management Trigger	Adaptive Management Response	When	Who Monitors	Party Responsible for Action
Critical Aquifer Recharge Areas (CARA)	Ensure that agricultural stewardship strategies and practices employed to protect and enhance groundwater quality and availability are effective.	Communication with Okanogan County Public Health. Review of any additional data pertaining to groundwater quality identified by technical staff or brought forward to the Workgroup by other organizations or agencies as part of their monitoring. (DOH & WSDA). Individual stewardship planning process.	Reported incidents of groundwater contamination within the CARA.	Reported degradation of groundwater within the CARA related to agricultural activities.	• Assess whether issues are connected to agriculture. • Focus outreach and education to promote relevant stewardship practices in the affected area.	Every 2 years or more frequently, as needed	Okanogan CD	Okanogan CD, participating landowners
Wetlands	At the watershed scale and in relation to agricultural activities, prevent degradation of wetland functions and values.	Existing aerial imagery (e.g., USDA NAIP imagery or LandSAT) and wetlands indicated by WDFW PHS and NWI data, intersected with WSDA agriculture data. Individual stewardship planning process. Data, technology, or research from outside monitoring programs as available[1].	Ag-related changes in wetland vegetation or extent, as identified using existing and publicly available data and aerial imagery. Summarized at the watershed scale.	Watershed-scale analysis of aerial imagery indicates trend toward net loss of critical area functions and values and is supported by ground- truthing through aerial monitoring verification protocol and stewardship planning process.	• Investigate available information to assess the cause of decreases. • Communicate with conservation district staff or survey area if necessary to determine participation in stewardship. • Determine if current stewardship strategies are supporting protection goals. • Identify further stewardship strategies and opportunities with Workgroup and conduct outreach and education to encourage implementation.			
Fish and Wildlife Habitat Conservation Areas (FWHCA)	At the watershed scale and in relation to agricultural activities, prevent degradation of FWHCA functions and values.	Existing aerial imagery (e.g., USDA NAIP imagery or LandSAT), fish-bearing stream data (PHS, Colville Tribes, DNR), and WDFW PHS data intersected with WSDA agriculture data. Data, technology, or research from outside monitoring programs as available[1]. Assessment tools include CCT OBMEP reports, watershed health assessments (Ecology), fish barrier inventories. Individual stewardship planning process.	Ag-related changes in vegetative cover in riparian vegetation, as identified using existing and publicly available data and aerial imagery. Changes detected through NDVI. Summarized at the watershed scale.					
Frequently Flooded Areas (FFA)	At the watershed scale and in relation to agricultural activities, prevent degradation of FFA functions and values.	Existing aerial imagery (USDA NAIP imagery or LandSAT) and FEMA flood hazard data intersected with WSDA agriculture data. Data, technology, or research from outside monitoring programs as available[1]. Individual stewardship planning process.	Ag-related changes in vegetative cover within floodplains, as identified using existing and publicly available data and aerial imagery. Summarized at the watershed scale.					
Geologically Hazardous Areas (GHA)	At the watershed scale and in relation to agricultural activities, prevent degradation of GHA functions and values.	Existing aerial imagery (USDA NAIP imagery or LandSAT) and USDA SSURGO slope data intersected with WSDA agriculture data. Data, technology, or research from outside monitoring programs as available[1]. Individual stewardship planning process.	Ag-related changes in vegetative cover on steep slopes, as identified using existing and publicly available data and aerial imagery. Summarized at the watershed scale.					

Notes:

1. Data, technology, or research from outside monitoring programs are listed in Appendix I, and additional sources may be identified during VSP monitoring.

6-3 Agricultural Viability Goals Monitoring and Adaptive Management Strategy

Viability Goal	Performance Objectives	Performance Metrics	Monitoring Method	Adaptive Management Trigger	Adaptive Management Action	Who Monitors	When
Maintain a secure link between agricultural producers and agricultural land base.	Agricultural practices continue to occur at similar levels.	Change in agricultural land cover.	Evaluate existing land cover data with USDA Cropscape tool to assess changes in agricultural land use.	Significant decrease in presence of agricultural activities on the ground.	Coordinate with agricultural stakeholder groups/ individuals to assess why decreases are occurring and approaches to address it.	OCD/VSP Coordinator	Every 5 Years
	Permits and leases for crop lands and grazing allotments on federal and state lands are available at similar levels.	Acreage data from state and federal agencies.	Request information from State and Federal agencies about land use.	Significant conversion of agricultural lands to non-agricultural use by public agencies.	Coordinate with agricultural stakeholder groups/ agencies to assess why decreases are occurring and approaches to address it.		
	Preservation mechanisms exist to maintain lands in agriculture.	Comprehensive planning and zoning encourages preservation of agricultural resources.	Communicate with County officials.	Significant threats to agricultural land base due to development.	Coordinate with stakeholders and land preservation organizations to review available opportunities.		
	Maintain Right to Farm Ordinance.	Existence of Right to Farm Ordinance for the County.	Communicate with County officials to ensure ordinance still exists	Right to Farm Ordinance no longer Exists or is being infringed upon.	Work with officials and stakeholder groups to encourage a similar ordinance.		
Water resources necessary for producers are available and reliable.	Water rights transfer assistance continues to exist	Continued availability of water rights transfer assistance.	Communicate with Water Conservancy Board to ensure water rights transfer assistance is available.	Water Rights Transfer Assistance no longer exists.	Work with stakeholders and local officials to encourage continuation of transfer assistance program.		
	Water rights are maintained within Okanogan County.	Educational opportunities related to maintaining active water rights are available.	Communicate with regional organizations about presentations and educational opportunities delivered.	Informational opportunities are not provided.	Work with organizations to provide informational opportunities		
Improved agricultural market infrastructure and services.	Agriculture related businesses and services exist within the county.	Number of agriculture related businesses and services that exist.	Compare available economic impact analysis data or Department of Revenue data to baseline.	Significant decrease in overall number of businesses and services, or loss of sole business in a particular market sector.	Coordinate with agricultural stakeholder groups/ individuals to assess why decreases are occurring and possible approaches to address it.		
Education, training, and support for best management practices	Availability of education, technical resources, programs and events	Number of available resources, programs and events.	Communicate with OCD, NRCS and other groups to assess available programs and number of events held.	Significant decrease in resources or programs available, significant decrease in events held or in participation in events held.	Coordinate with agricultural stakeholder groups/ individuals to determine what additional education and assistance they need.		
A welcoming business environment with flexibility for agricultural operators.	Improved understanding between agricultural operators and agency personnel.	Number of forums and meetings to discuss key issues in a cooperative manner.	Keep records of public forums or meetings that are held by County, OCD, and other groups.	Lack of opportunities for discourse between agricultural community and agency personnel	Coordinate with VSP staff, County officials, agency personnel, and agricultural stakeholders to facilitate additional communication and/or meetings.		
	Implementation of flexible site-specific solutions to address critical areas issues.	Types of practices that are permitted.	Evaluate the types of projects that are permitted vs what landowners want to do. Communicate with NRCS and other groups.	Adverse impacts to agriculture due to flooding and streambank erosion continue and landowners report lack of management alternatives.	Coordinate with VSP staff, County officials, agency personnel, and agricultural stakeholders to facilitate communication and/or meetings to develop solutions.		
	Farming remains economically viable and productive.	Number of farms operating in Okanogan County.	Review WSDA and USDA census data for number of operating farms.	Significantly fewer farms are operating.	Coordinate with agricultural stakeholder groups/ individuals to assess why decreases are occurring and possible approaches to address it.		
Protect private property rights	Voluntary approaches are used for environmental protection, rather than regulatory approaches.	Participation in stewardship practices and programs remains voluntary.	Ensure that VSP participation is still voluntary.	Within the scope of VSP, incidents contrary to the provisions of the "no enforcement" resolution on page i reported to VSP staff or VSP Workgroup	Work with involved parties to ensure that voluntary intent of VSP is followed. If necessary, clarify existing or write additional resolution to ensure strictly voluntary approach.		

7 Implementation and Reporting

7.1 Implementation Roles

Implementation will occur following the approval of this plan and will involve outreach and technical assistance to agricultural operators and reporting on progress. Per RCW 36.70A.720 (d) & (f), Work Plans are required to "Ensure outreach and technical assistance is provided to agricultural operators in the watershed" and "designate the entity or entities that will provide technical assistance." Technical assistance roles are summarized below and based upon sufficient funding to support the activities.

Table 7-1 Summary of Tasks and Technical Assistance Roles

Task	Lead	Tech. Assistance as Needed	When
Conduct outreach to encourage participation in VSP Stewardship Checklist and voluntary practices	OCD	OCD/Work Group	Ongoing Outreach Plan assessed and updated each biennium
Distribute and record VSP Stewardship Checklists and provide assistance as needed.	OCD	OCD	Ongoing after plan approval
Evaluate participation in stewardship practices, conservation planning, and other conservation programs and benchmark progress.	OCD	USDA – NRCS	2021, 2026
Review indicators to determine whether stewardship goals and strategies are translating to protection and enhancement of critical area functions and values has occurred at watershed scale.	OCD/ Workgroup	WDFW, DNR, Ecology	Ongoing after plan approval
Report to County and WSCC director on whether goals and benchmarks for protection and enhancement of critical areas were met.	Okanogan County Planning/OCD/ Workgroup	NA	2021, 2026
If goals are being met, existing Work Plan is maintained and implemented.	Okanogan County Planning/OCD/ Workgroup	NA	Ongoing after plan approval
Adaptively manage if goals are not met	VSP Workgroup/ OCD/Okanogan County	OCD, VSP Technical staff	Annually, as required
Provide written report on the status of the Work Plan, including accomplishments and participation rates, to the County and to WSCC	VSP Workgroup/ OCD and Okanogan County Technical Staff	NA	September 2018, 2020, 2022, 2024 and 2026
Communicate with state agencies regarding monitoring efforts to see if better cooperation is possible.	VSP Workgroup/ Okanogan County/OCD	NA	Annual

7.1.1 Technical Assistance

Technical assistance occurs in a variety of ways, including assisting with VSP Stewardship Checklists, providing advice on use of specific practices, and sharing educational information at forums, meetings, and other venues. Technical assistance, stewardship checklists, and conservation planning are opportunities to promote stewardship practices and monitor critical area protection with individuals that choose to participate in the VSP program. Numbers of participants in stewardship planning and stewardship checklists completed will be included in biennial reporting.

7.1.2 VSP Awareness Outreach

VSP awareness outreach efforts will be conducted with the goal of making as many watershed stakeholders as possible aware of the program and increasing face-to-face contact between stakeholders. This will include telephone, email, and postal outreach to existing watershed contacts and past cooperators, presenting at local meetings and conducting workshops around the county. For further information, see Appendix J: Outreach Plan. The Okanogan Conservation District utilizes online and print copy methods to reach community members with limited access to the internet. Strategically placed flyers, social media, and meeting presentations have a proven effectiveness in Okanogan County.

7.1.3 Stewardship Practice Outreach and Education

Maximizing landowner awareness of potential stewardship practices and the implementation process will be a key part of promoting voluntary stewardship practices. Field days, demonstrations, project tours, and informational media give landowners the opportunity to see how practices are applied on the ground. Okanogan County Conservation District has conducted tours of successful stewardship projects on a regular basis in the past, and continuation of those events will be important to maximize awareness of stewardship practices.

Outreach methods will be chosen to target the appropriate audience for the stewardship material presented. Work Group members and the Conservation District will work with active agricultural organizations, such as the Horticulture Association and Cattleman's Association, to distribute relevant technical and program information. This method has a high rate of contact compared to Okanogan CD hosted events, which vary in attendance.

Okanogan CD and Okanogan County will develop a web page to host specific critical area management recommendations and stewardship practice guidance. The web page will refer to existing documents with recommendations for improving wildlife habitat for local species, recognizing hazardous areas, wetland protection recommendations, and other relevant guidance. Print copies of the material will also be available at meetings and the Okanogan Conservation District office.

The number of participants at each event will be recorded by the Conservation District and reported to the County and the WSCC. Event locations will be dispersed throughout the County.

7.1.4 Improving Partnerships

VSP is intended to "encourage and foster a spirit of cooperation and partnership among county, tribal, environmental, and agricultural interests to better assure the program success." Improving dialog between the key stakeholders and agencies surrounding agriculture and critical areas and working to find areas of common ground within their objectives will help facilitate the success of the VSP in Okanogan County. The process of public outreach and monthly VSP Workgroup meetings has already contributed to this effort. A network of mentorship and on-farm learning opportunities will also be encouraged among program participants.

7.2 Reporting

Per RCW 36.70A.720, the workgroup must:

> *(1) (j) provide a written report of the status of plans and accomplishments to the county and to the commission within sixty days after the end of each biennium;*
>
> *(2) (b)(i) Not later than five years after the receipt of funding for a participating watershed, the watershed group must report to the director and the county on whether it has met the work plan's protection and enhancement goals and benchmarks.*
>
> *(2) (c) (i) Not later than ten years after receipt of funding for a participating watershed, and every five years thereafter, the watershed group must report to the director and the county on whether it has met the protection and enhancement goals and benchmarks of the work plan.*

Reporting will occur in accordance with guidelines from the Statewide Advisory Committee and Conservation Commission in Policy Advisory #05-18, Approved VSP Work Plan Implementation Reporting Requirements & Procedures.

Based on the initial receipt of VSP funding in December 2015, the Okanogan County VSP work group is required to complete the following reporting tasks:

- **2-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 the March 2016 receipt of funding date, 2-year reports are due by end of August in 2019, 2021, 2023, 2025, and 2027.
- **5-year performance reports:** Developing and providing to the WSCC 5-year progress reports on Work Plan performance in meeting goals and benchmarks. Based on the December 2015 start date, 5-year progress reports would be due in December 2020 and 2025 and every five years thereafter.

Table 7-2 Reporting Timelines

Type	Schedule	Roles and Responsibilities
Program Evaluation (2-Year Status Reports)	Finalize Work Plan in 2018. (August, 2018 per WSCC)	Work Group with assistance from VSP Coordinator
	2019, 2021, 2023 etc.	VSP Coordinator
5-Year Performance Reports (Report on Goals and Benchmarks)	2020, 2025 et seq.	Work Group oversees, VSP Coordinator prepares report
Adaptive Management or Additional Voluntary Actions	Ongoing after 2021	Work Group oversees adaptive management recommendations sent to WSCC
Any Additional Reporting Requirements	Ongoing after Work Plan Approval	Work Group with assistance from VSP technical staff

Appendix A: Related Plans, Regulations and Programs

Related Plans

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. The table below includes a summary of the planning documents and programs that were referenced for the VSP Work Plan and appendices. Additionally, Okanogan Conservation District staff contacted technical staff with the Colville Confederated Tribes (CCT) and Yakama Indian Nation (YIN) about fish and wildlife monitoring efforts which occur but are not in simple plans. For example, CCT has a robust monitoring and evaluation program through Okanogan Basin Monitoring and Evaluation Program.

The plans listed below include recommendations for improving critical area functions by working collaboratively with local landowners to meet conservation goals.

Table A-1
Summary of State and Local Planning Documents

Plan or Program	Date	Author/Agency	Description
Okanogan Watershed Water Quality Plan	1999 & 2005	Okanogan Conservation District & Okanogan County	Okanogan Watershed plan that includes recommendations and strategic actions that address water quality.
Okanogan Watershed Plan	2009	Okanogan Watershed Planning Unit	Okanogan Watershed plan with recommendations on water quantity, water quality, instream flow, and aquatic habitat.
Okanogan Watershed Limiting Factors Analysis	2001	Colville Confederated Tribes	Analysis of factors that limit habitat for ESA listed salmonid species in the Okanogan River Watershed (WRIA 49).
Methow Watershed Plan	2005	Methow Basin Planning Unit	Analysis of water availability and uses in the Methow River Water Resource Inventory Area (WRIA 48).
Methow Watershed Limiting Factors Analysis	2001	Washington State Conservation Commission	Analysis of factors that limit habitat for ESA listed salmonid species in the Methow River Watershed (WRIA 48).
Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan and revised Biological Strategy	2007	Upper Columbia Salmon Recovery Board	Plan is for the recovery of Upper Columbia Spring Chinook, Upper Columbia steelhead, and bull trout.
Middle Methow Reach Assessment	2010	USDI Bureau of Reclamation	Evaluation of aquatic habitat and watershed process conditions in the Middle Methow River (WRIA 48).
Upper Methow Reach Assessment	2015	Yakama Nation Fisheries	Evaluation of aquatic habitat and watershed process conditions in the Upper Methow River (WRIA 48).
Barriers to Anadromous Fish in the Okanogan River Basin	2007	CCT Fish and Wildlife Program, Bonneville Power Administration	Valuation of stream barriers in the Okanogan River basin

Middle Twisp River Reach Assessment & Restoration Strategy	2015	Yakama Nation Fisheries	Evaluation of aquatic habitat and watershed process conditions in the Middle Twisp River (WRIA 48).
Big Valley Reach Assessment	2008	USDI Bureau of Reclamation	Evaluation of aquatic habitat and watershed process conditions in the Big Valley Reach of the Methow River (WRIA 48).
Twisp to Carlton Reach Assessment	2017	Cardno, Inc.	Evaluation of aquatic habitat and watershed process conditions in the Methow River from Twisp to Carlton (WRIA 48).
Lower Twisp River Reach Assessment	2010	Yakama Nation Fisheries	Evaluation of aquatic habitat and watershed process conditions in the Lower Twisp River (WRIA 48).
WDFW Management Recommendations for Washington's Priority Habitats: Riparian	Various	Washington Department of Fish and Wildlife	Series of guiding documents with recommendations on conserving habitat values for priority fish and wildlife species.
Bonaparte Creek-Okanogan River Watershed Rapid Watershed Assessment	2012	Okanogan Conservation District	Analysis of watershed conditions for the Bonaparte Creek watershed in WRIA 49.
Omak Creek PL-566 Small Watershed Assessment	1995	USDA Natural Resources Conservation Service	Analysis of watershed condition for the Omak Creek watershed in WRIA 49.
Lower Okanogan River Basin DDT and PCBs Total Maximum Daily Load	2004	Washington State Department of Ecology	Identification of sources of DDT and PCB contribution to surface waters in the Okanogan River (WRIA 49)
Chewuch River Reach Assessment	2010	Yakama Nation Fisheries Program	Assessment evaluating aquatic habitat conditions in the lower 20 miles of Chewuch River
Focus on Irrigation-Influence Wetlands	2010	Washington State Department of Ecology	Provides clarification on the jurisdiction over wetlands created by irrigation.
Washington State Aquatic Habitat Guidelines Program	Various	WDFW, WA Dept. of Transportation, WA Dept. of Ecology	Provides guidance on managing and improving aquatic and riparian 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.

The table below includes 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 provided a "regulatory backstop." For example, the Washington State Department of Ecology will continue to regulate wetland conversions on agricultural lands through the Washington State Water Pollution Control Act. Continued compliance with these regulations provided assurances the functions and values of critical areas are protected.

Federal Regulations that Apply to Agriculture

Regulation(s)	Agency	Description	VSP Intersect
Agricultural Act (Farm Bill)	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)	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)		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)		NPDES is promulgated under the CWA to regulate discharges to waters of the United States from animal feeding operations and other point sources.	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.
Endangered Species Act (ESA)	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)	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)	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.

State 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	Washington State *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 Title 89 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.
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 90.58 defines shoreline regulations through the Shoreline Mater Program 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)			
Regulation(s)	**Agency**	**Description**	**VSP Intersect**
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.
Title 220	Washington State Department of Fish and Wildlife	WAC Title 220 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 220-440 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.

Okanogan Regulations that Apply to Agriculture

Regulation(s)	Agency	Description	VSP Intersect
Critical Areas Ordinance	Okanogan County Planning	The Okanogan County Critical Areas Ordinance is promulgated under Okanogan County Code (OCC) 14.12	OCC 14.12.570 exempts existing and ongoing agricultural activities occurring within critical areas and their buffers. If agricultural activities cease then that land would be subject to the ordinance.
Shoreline Master Program		The current Shoreline Master Program was approved in June 26, 2018.	The Shoreline Master Program covers new agricultural uses and activities within shorelines of the state defined as 200 feet from the ordinary high-water mark and does not limit or modify existing or ongoing agricultural activities.
Floodplain Management		The Okanogan County Floodplain Management ordinance is promulgated under OCC 15.08	The floodplain management ordinance is intended to promote public health, safety, and general welfare by ensuring that development activities within the 100-year floodplain do not negatively affect the lands ability to reduce flood and storm drainage and to minimize and eliminate public and private losses due to flood conditions.

*Includes agencies responsible for overseeing agriculture-specific regulations. Other agencies may be assigned jurisdiction for non-agriculture related regulations described therein.

Existing Public, Private, Non-Profit Conservation Programs in Okanogan County

As described in the Voluntary Stewardship Program (VSP) Work Plan (Section 4), the VSP provides a voluntary framework for critical areas protection and enhancement actions carried out by agricultural producers while maintain 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 Okanogan 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. The table below includes a summary of federal, state, and private agencies that provided a variety of conservation programs available to agricultural producers that include technical assistance and financial assistant.

Conservation Programs & Resources for Producers

Lead	Description	Program(s)	Details
State and Local Conservation			
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**	Voluntary and locally led program for landowners seeking to resolve land-use and natural resource issuers through local coalitions and consensus building.
		Irrigation Efficiencies Grant Program (IEGP)	Provides financial incentives to landowners willing to install irrigation systems that save water.
		Natural Resource Investment (non-shellfish) Grants	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)	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 permitting assistance for landowners.	Biologists available for technical assistance and permit guidance as time permits	
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.	**Aquatic Lands Enhancement Account (ALEA)**	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	Grant program for eligible parties seeking to improve important habitat conditions or watershed processes to benefit salmon and bull trout
		Farmland Preservation Grants	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.

Lead	Description	Program(s)	Details
State and Local Conservation Programs			
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**	Grant and loan program for high-priority projects to protect and improve the health of Washington State Waters.
		Farmed Smart Partnership	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.
Okanogan Conservation District (OCD)	OCD 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	**Irrigation Efficiencies**	Increase Irrigation efficiency by converting hand or wheel line irrigation systems to pivots
		Save Water, Save Energy	Rebate program to reduce power consumption by increasing irrigation system efficiency. This can include individual irrigation hardware and water management. Applies to existing irrigation systems components and repairs.
		WQ BMP's	Information, site assessments and possible cost assistance to address water quality
		NPS Fire	Technical assistance on erosion control in fire affected watersheds. Water quality project planning and implementation.
		Implementation (Non- shellfish)	Information, site assessments and possible cost assistance for materials for a wide range of conservation practices intended to protect and restore soil, water and other natural resources.
Washington State University (WSU) Extension	The WSU Extension program connects agricultural and natural resource stakeholders and industries, as well as the general public, to research-based information and locally relevant applied research in agriculture and natural resource sciences.	**Agriculture and Natural Resources Program**	WSU Extension provides agricultural producers with technical assistance, research, and education services.

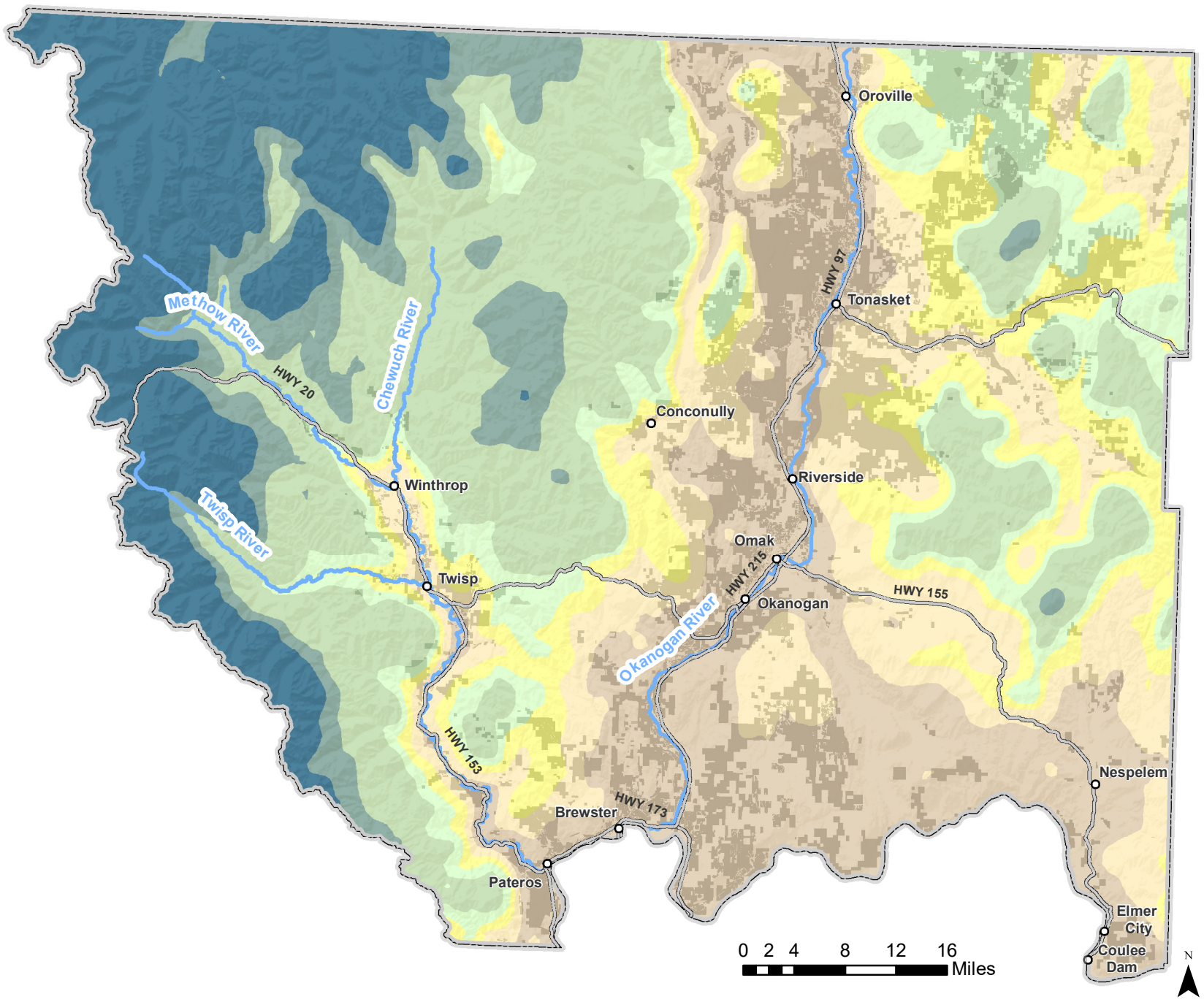
Lead	Description	Program(s)	Details
State and Local Conservation Programs			
Natural Resource Conservation Service (NRCS)	NRCS provides technical and financial assistance to help agricultural producers make and maintain conservation improvements on their land. NRCS also offers conservation easement programs and partnerships to leverage existing conservation efforts on farm lands.	**Agricultural Management Assistance**	Helps agricultural producers use conservation to manage risk and solve natural resource issues through natural resources conservation.
		Conservation Stewardship Program	Helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resources concerns.
		Environmental Quality Incentives Program	Address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat.
Farm Service Agency (FSA)	FSA oversees several voluntary, conservation related programs that work to address several agriculture related conservation measures	**Farmable Wetlands Program**	A program designed to restore previously farmed wetlands and wetland buffer to improve both vegetation and water flow.
		CREP	This program provides incentives to restore and improve salmon and steelhead habitat on private land by establishing riparian forested buffers.
		Source Water Protection Program	Help prevent pollution of surface and ground water used as the primary source of drinking water by rural residents.
Washington Water Trust (WWT)	WWT is a neutral, nonregulatory, nonprofit, dedicated to improving and protecting stream flows and water quality. WWT uses voluntary, market-based transactions and cooperative partnerships to create balanced solutions.	**WWT Leases**	WWT leases and buys water from water right holders to improve flows and develop solutions to benefit watersheds and water rights holders.
Cascade Columbia Fisheries Enhancement Group (CCFEG)	CCFEG works in partnerships with local, state and federal agencies, Native American tribes, local businesses, community members.	**Native Trout and Salmon Recovery**	CCFEG works in partnerships with local, state and federal agencies, Native American tribes, local businesses, community members, and landowners to restore salmonid populations.

Private and Non-Profit Program			
Trout Unlimited (TU)	TU conserves, protects and restores North America's cold-water fisheries and their wetlands.	**Restoration**	Projects to protect and conserve salmon habitat. TU works with farmers and ranchers to economize water use, restore trout and salmon streams to habitable conditions and upgrade basic practices that benefit both production and irreplaceable habitat.
Methow Salmon Recovery Foundation (MSRF)	MSRF helps the Methow community steward its river ecosystems through scientifically based and locally controlled salmon recovery projects to improve and protect salmon habitat.	**Restoration**	Projects to protect and conserve the local salmon habitat.
Okanogan Highland Alliance (OHA)	OHA encourages and supports education and public participation in decisions involving the integrity, sustainability, and prosperity of our community and the environment. OHA protects, restores, and preserves the biodiversity of the Okanogan highlands.	**Restoration**	On the ground restoration projects in the Okanogan Highlands.
Okanogan Land Trust (OLT)	OLT helps landowners in Okanogan conserve specific features including farms, ranches, forests, waterways, and wildlife habitats.	**Conservation Easement**	Conservation easements is voluntary tool for protecting and preserving resources while also keeping the conserved land in private ownership.
Methow Conservancy	Methow Conservancy helps landowners to permanently protect specific conservation values like wildlife habitat, scenic views, open space, forests, riverfronts, working farms and ranches	**Conservation Easement**	Helps landowners put a conservation easement on their property.

Appendix B: VSP Map Folio

Larger maps are available from the Okanogan Conservation District.

Figure 1
Annual Average Precipitation, Okanogan County, WA



Sources: Esri, USGS, NOAA

Okanogan County, WA

Notes:

1. Precipitation data acquired from PRISM Climate Group, Oregon State University.Private agriculture land data acquired from WSDA cropland data (2011), Okanogan County parcel data (2011), USDA Census of Agriculture (2012).

Major Rivers
Interstate/Highway
County Boundary
Incorporated City/Town
Private Agriculture Land (2011)

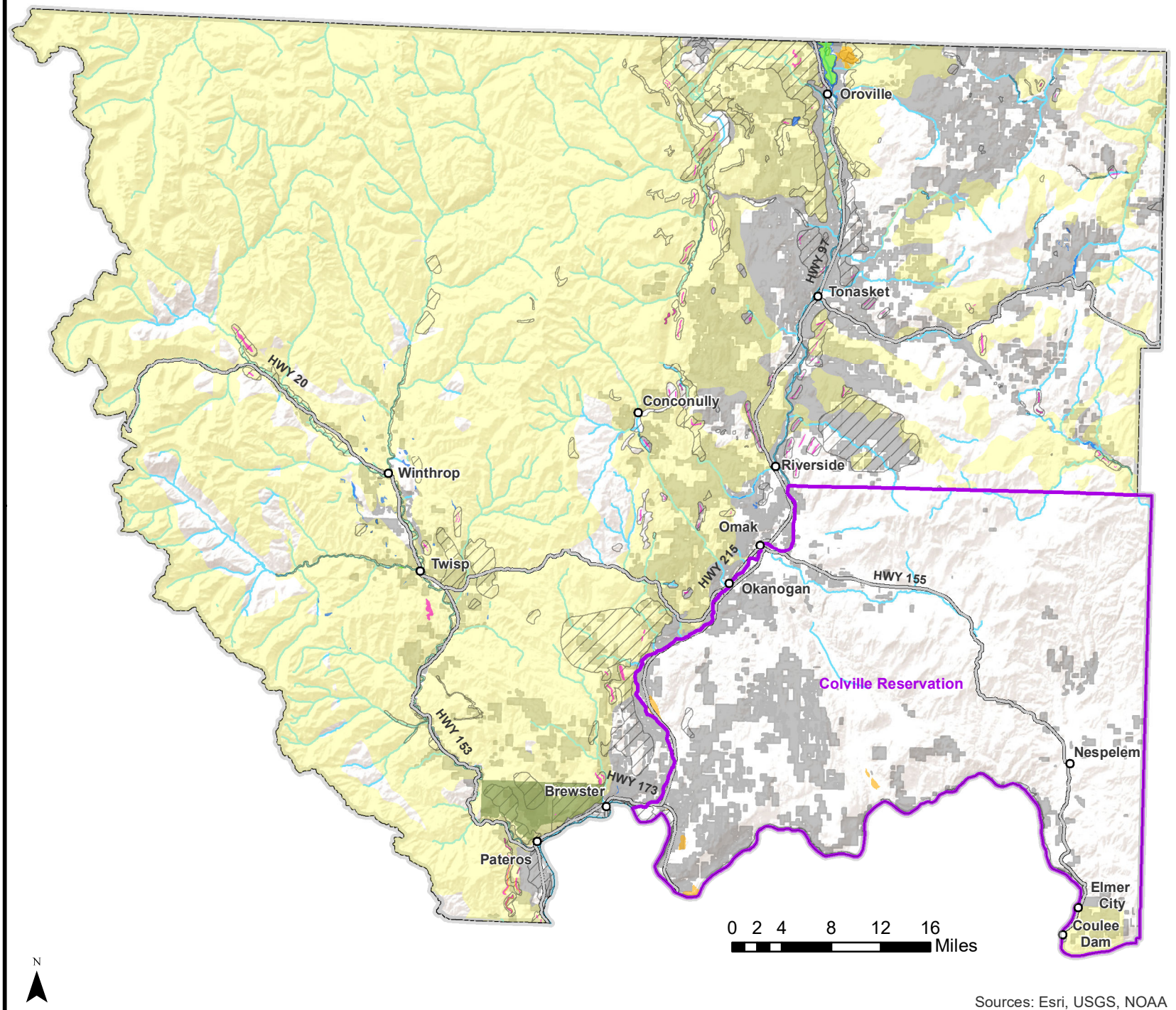
30-yr Normal Annual Precipitation range

- <14 inches
- 14 - 16
- 16 - 18
- 18 - 20
- 20 - 30
- 30 - 40
- >40 Inches

Okanogan Conservation District

Voluntary Stewardship Program

Figure 2
Fish and Wildlife Conservation Areas (PHS)



Sources: Esri, USGS, NOAA

Okanogan 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. Critical areas presence is determined on a case-by-case basis through farm stewardship planning.
2. PHS data provided by the WDFW(2016).

**PHS data is not mapped on Tribal land.

- Interstate/Highway
- County Boundary
- Incorporated City/Town
- Private Agriculture Land (2011)
- Colville Reservation

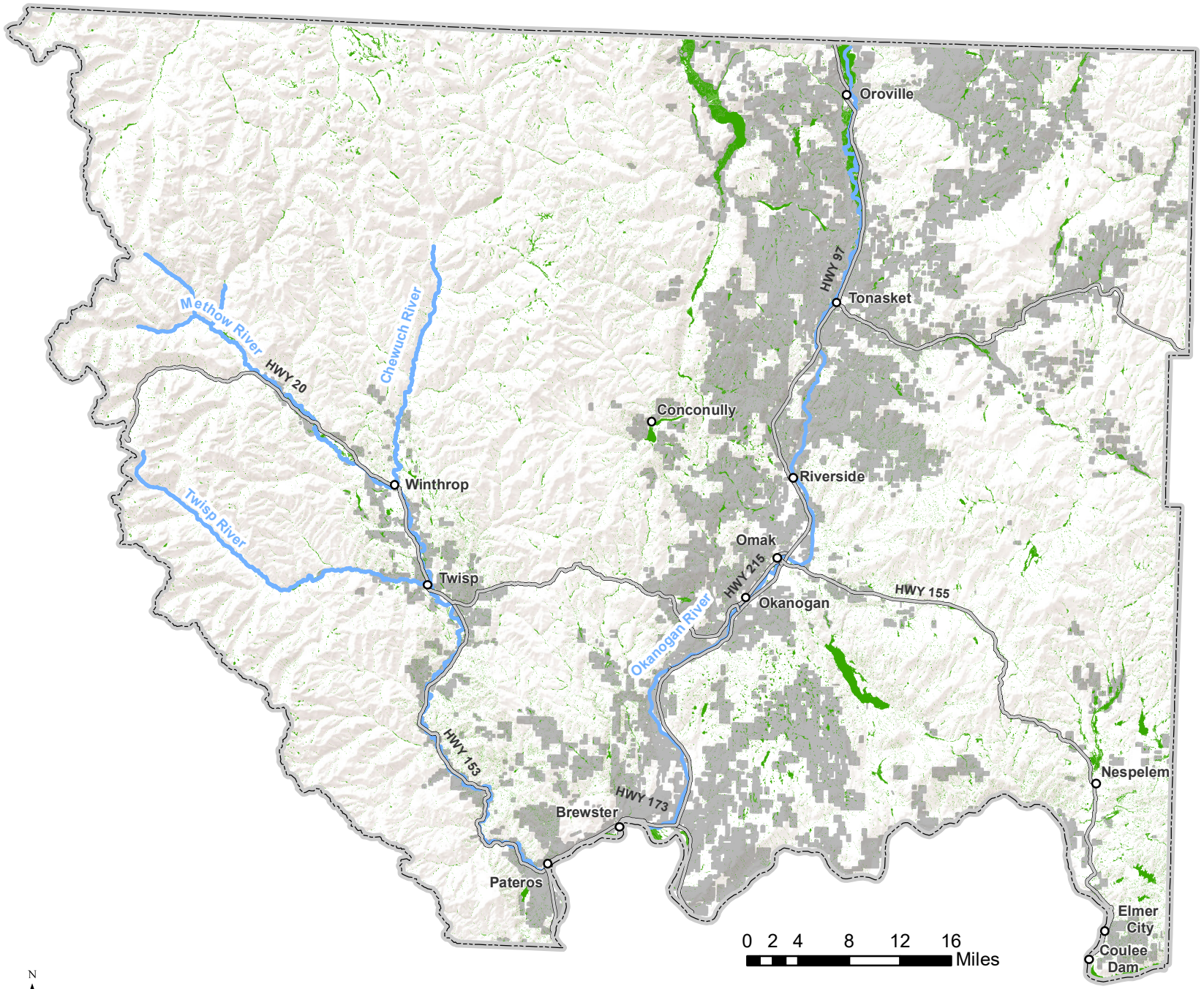
Priority Habitats and Species (PHS)

- Amphibians
- Cliffs/bluffs
- Other Species and Habitats
- Shrub-steppe
- Wetlands
- Birds
- Mammals
- PHS Streams

Okanogan Conservation District

Voluntary Stewardship Program

Figure 3
Wetlands



Sources: Esri, USGS, NOAA

Okanogan County, WA

Notes:

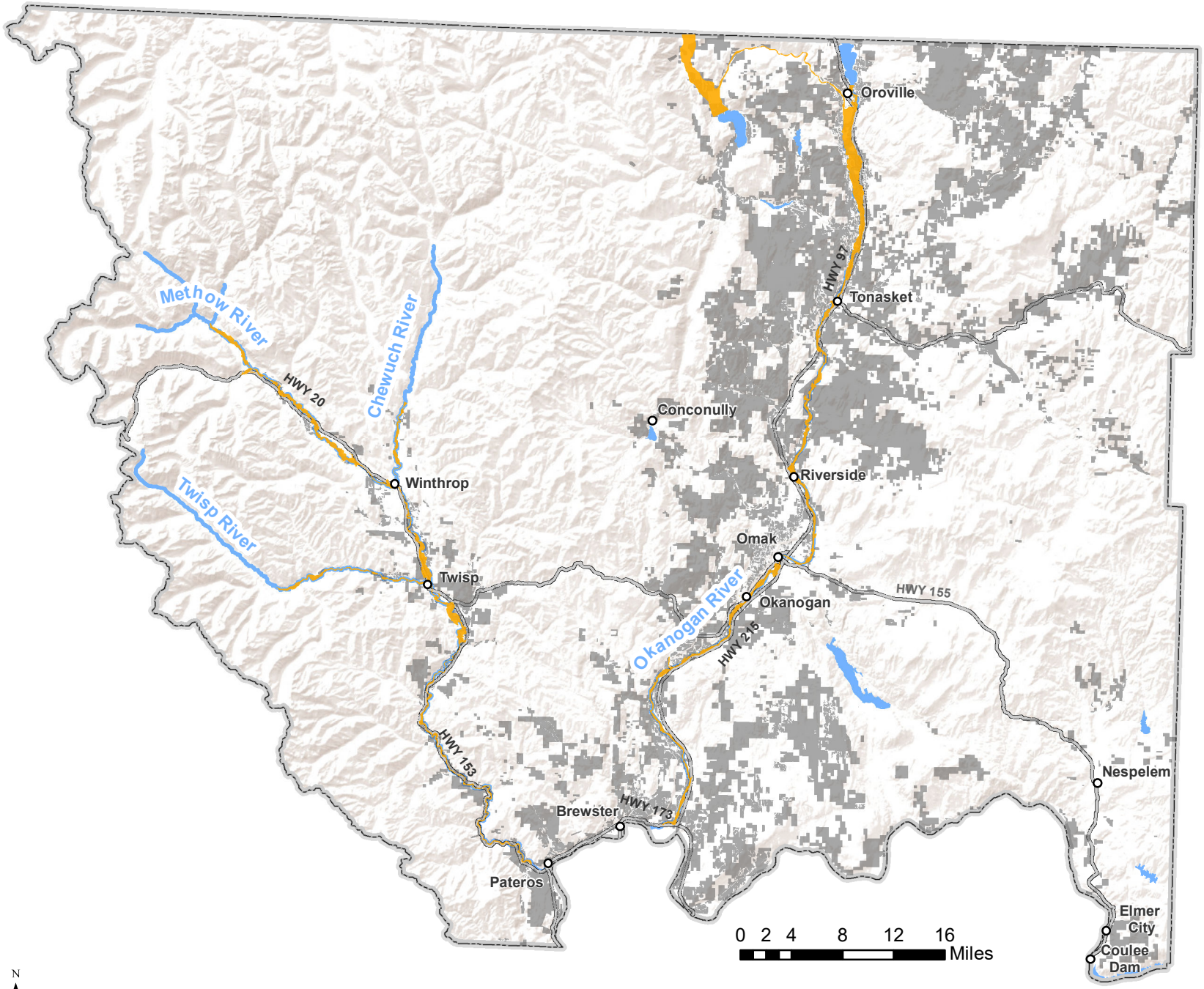
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Critical areas presence is determined on a case-by-case basis through farm stewardship planning.
2. Wetlands data acquired from NWI, USFWS (2017). Private agriculture land data acquired from WSDA cropland data (2011), Okanogan County parcel data (2011), USDA Census of Agriculture (2012).

- Major Rivers
- Interstate/Highway
- County Boundary
- Incorporated City/Town
- Private Agriculture Land (2011)
- Wetlands

Okanogan Conservation District

Voluntary Stewardship Program

Figure 4
Frequently Flooded Areas



Sources: Esri, USGS, NOAA

Okanogan County, WA

Notes:

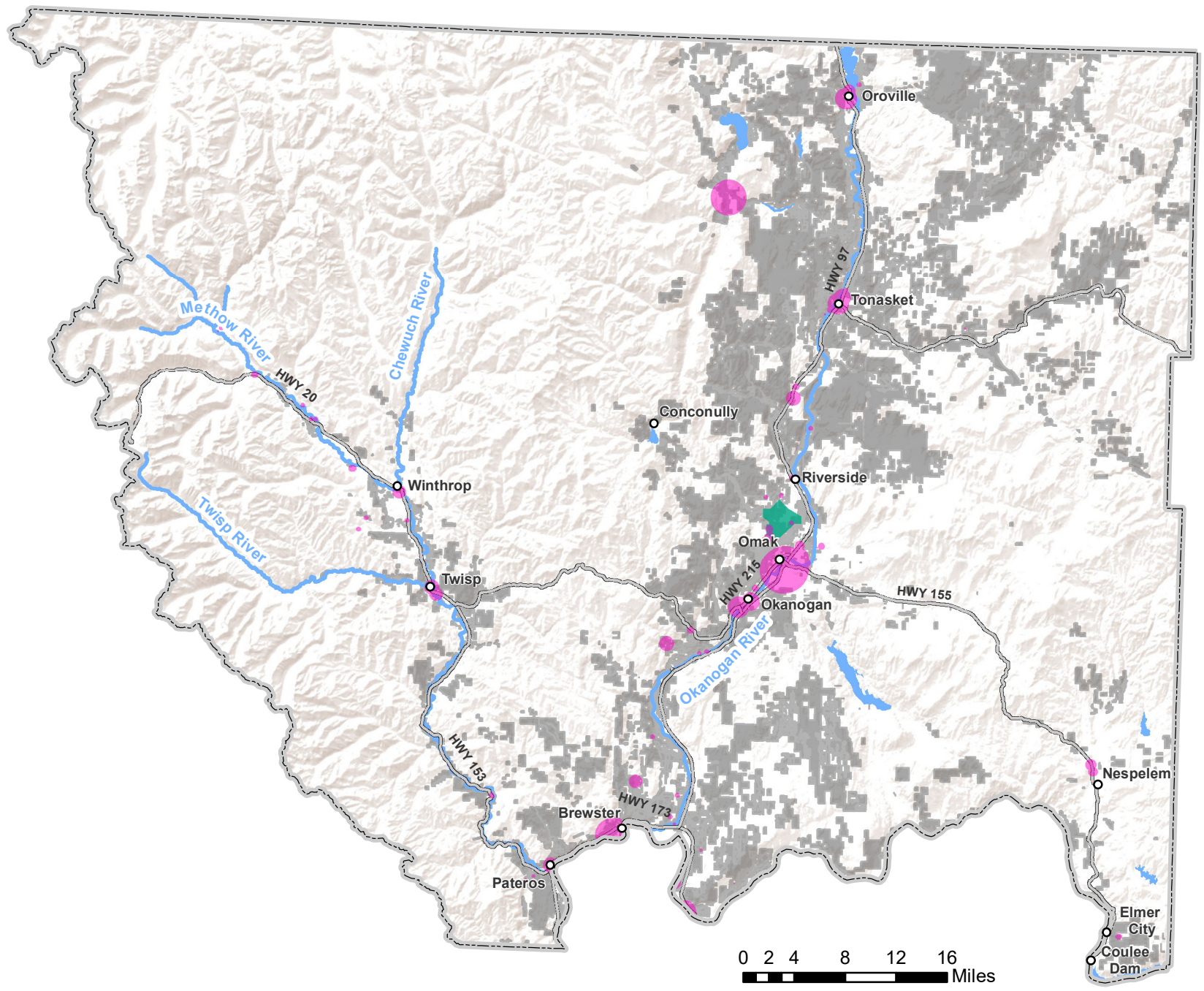
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Presence of critical areas can only be determined on case-by-case basis.
2. Frequently flooded areas overlap 1% of private agricultural lands in the County.
3. Special flood hazard area data acquired from FEMA by Okanogan County (2011). Private agriculture land data acquired from WSDA cropland data (2011), Okanogan County parcel data (2011), USDA Census of Agriculture (2012).

- MajorRivers
- Interstate/Highway
- County Boundary
- Incorporated City/Town
- Private Agriculture Land (2011)
- FEMA Special Flood Hazard Area

Okanogan Conservation District

Voluntary Stewardship Program

Figure 5
Critical Aquifer Recharge Areas



Sources: Esri, USGS, NOAA

Okanogan County, WA

Notes:

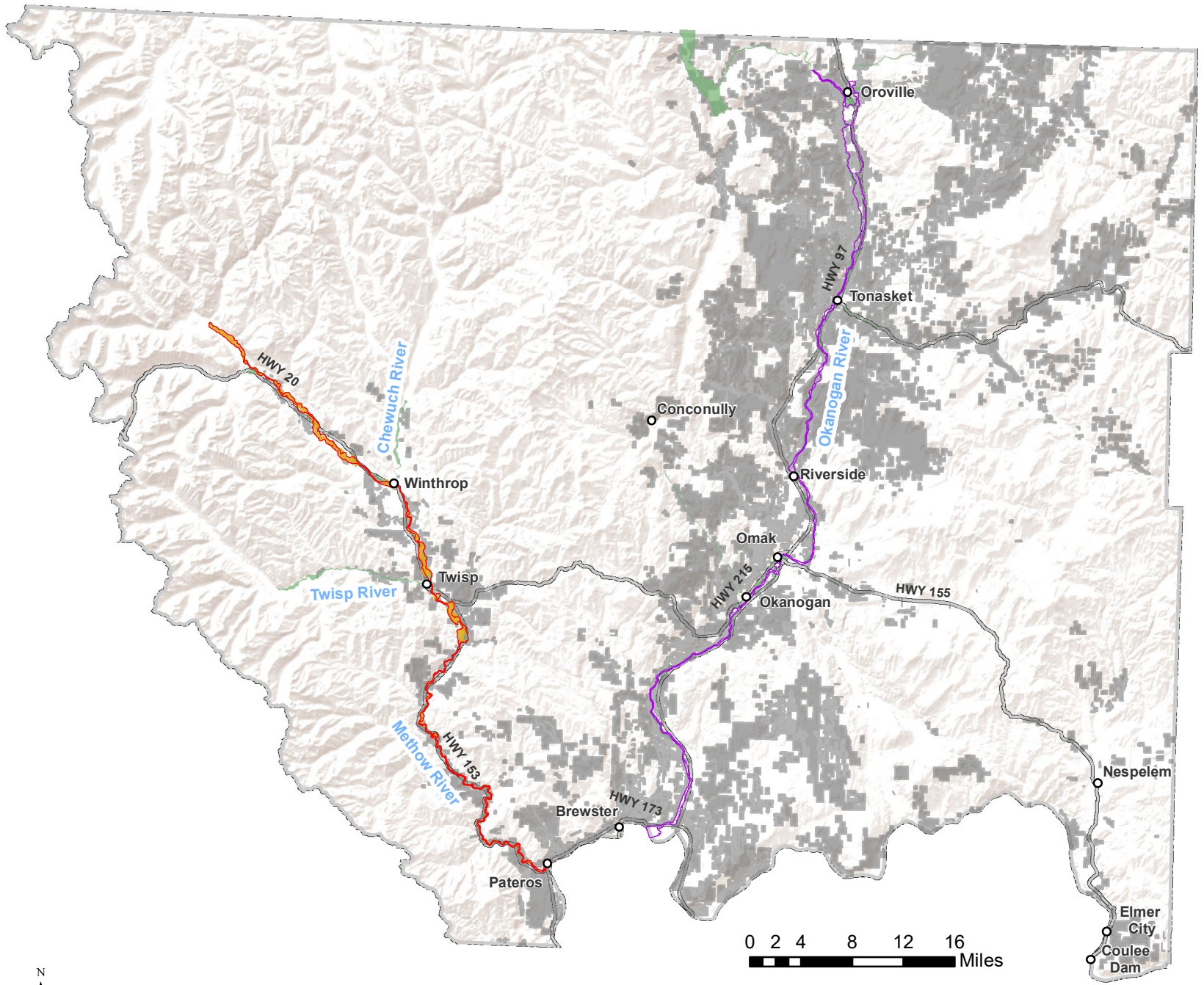
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Critical areas presence is determined on a case-by-case basis through farm stewardship planning.
2. Critical aquifer recharge data acquired from WA DOH, wellhead protection areas for up to 10-yr (2015). Duck Lake Ground Water Management Subareas (GWMS) data aquired from WA Dept of Ecology (1988). Private agriculture land data acquired from WSDA cropland data (2011), Okanogan County parcel data (2011), USDA Census of Agriculture (2012).

- MajorRivers
- Interstate/Highway
- County Boundary
- Incorporated City/Town
- Private Agriculture Land (2011)
- Critical Aquifer Recharge Area
- Duck Lake GWMA

Okanogan Conservation District

Voluntary Stewardship Program

Figure 6
Geologically Hazardous Areas - Channel Migration Zone



Sources: Esri, USGS, NOAA

Okanogan County, WA

Notes:

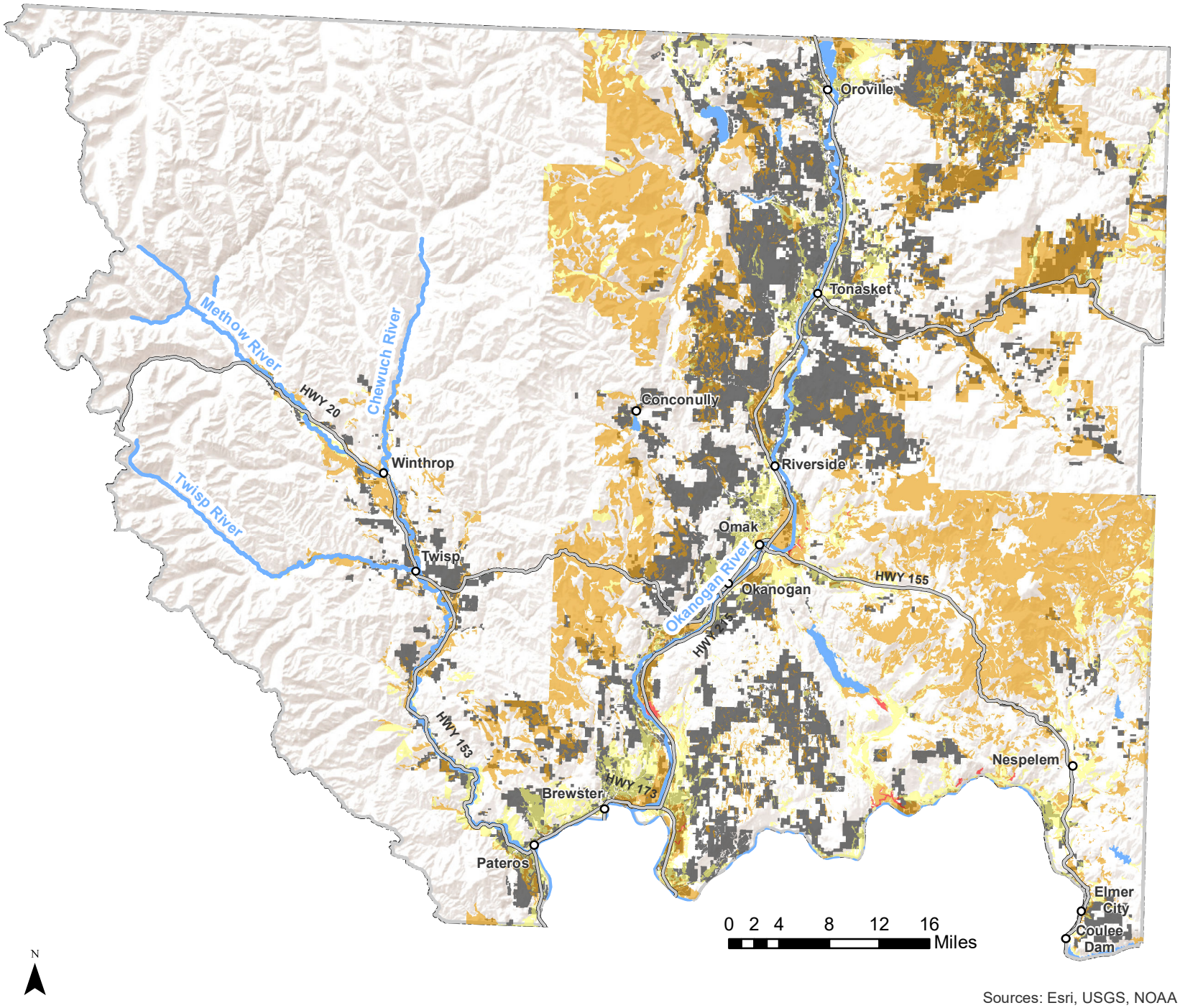
1. The data presented on this map identifies the potential presence of critical areas for planning level purposes and does not serve to designate critical areas within the County. Critical areas presence is determined on a case-by-case basis through farm stewardship planning.
2. Channel migration zones (CMZ) mapped by Okanogan County Office of Planning and Development. Private agriculture data acquired from WSDA (2001), Okanogan County parcels (2011), USDA Census of Agriculture (2012).

- Interstate/Highway
- County Boundary
- Incorporated City/Town
- Private Agriculture Land (2011)
- Severe CMZ (Channel Migration Zone)
- Moderate CMZ (Channel Migration Zone)
- Severe FHZ (Flood Hazard Zone)
- Moderate FHZ (Flood Hazard Zone)

Okanogan Conservation District

Voluntary Stewardship Program

Figure 7
Geologically Hazard Areas - Wind Erosion Hazard



Okanogan County, WA

Notes:

1. Wind Erodibility Groups (WEG) indicate wind erosion susceptibility for cultivated land based on soil physical properties. 1, 2, and 3 groups indicate severe, high, and moderate hazard.
2. Steep Slopes (greater than 30%) data from Okanogan County
3. Private agriculture land data acquired from WSDA cropland data (2011), Okanogan County Parcel data (2011), USDA Census of Agriculture (2012), wind erodibilty data acquired from USDA NRCS.

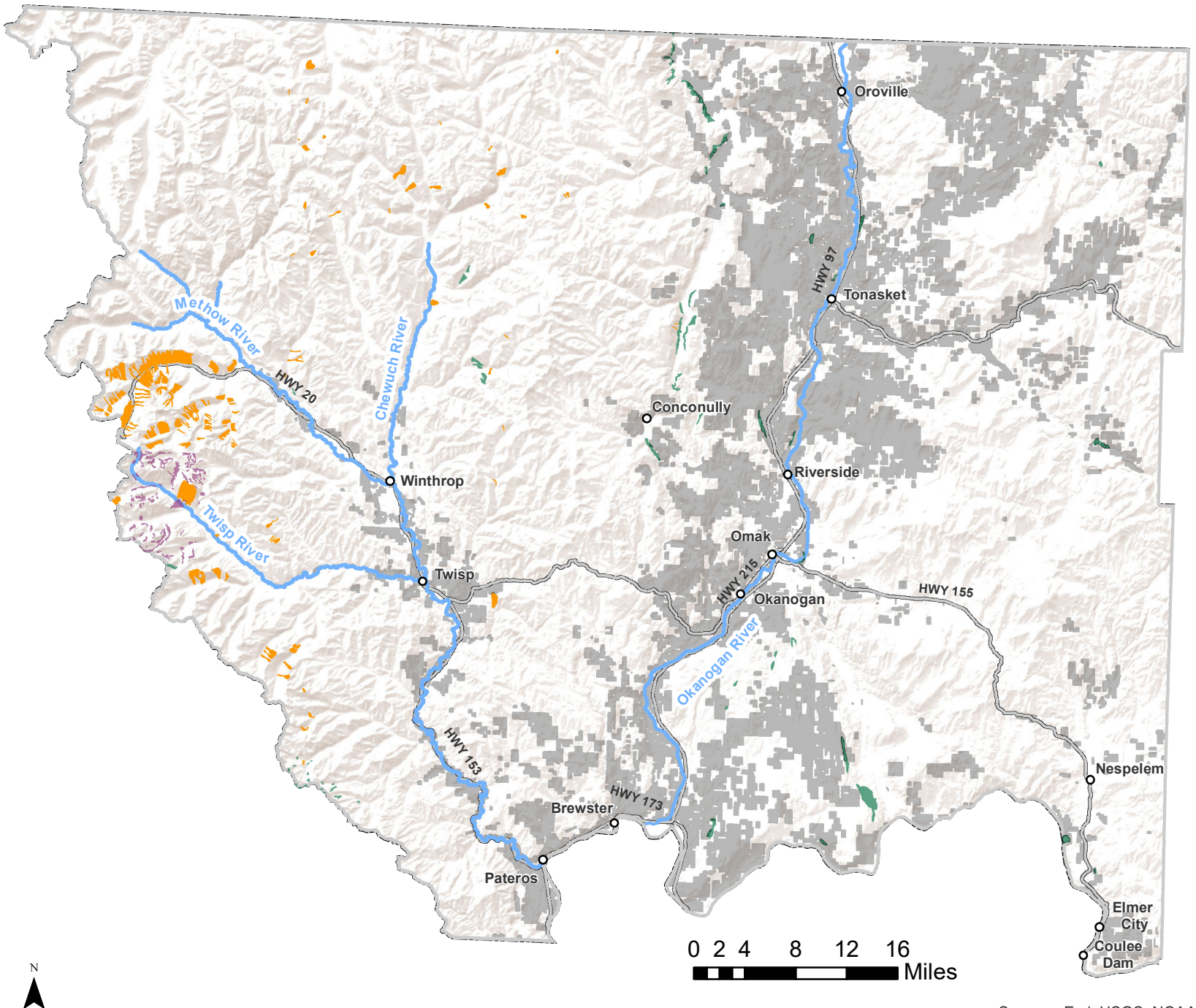
- MajorRivers
- Interstate/Highway
- County Boundary
- Incorporated City/Town
- Private Agriculture Land (2011)
- Severe
- High
- Moderate
- Steep Slopes

Sources: Esri, USGS, NOAA

Okanogan Conservation District

Voluntary Stewardship Program

Figure 8
DNR Mapped Landslides in Okanogan County (GHA)



Okanogan County, WA

Notes:

1. Mapped landslides by Washington DNR. Reconnaisance and Watershed landslide survey area only includes the Upper Methow Valley. Maps do not identify all landslides, or potential landslide hazard.

- Major Rivers
- Interstate/Highway
- County Boundary
- Incorporated City/Town
- Private Agriculture Land (2011)
- 24K Landslides
- 1:100,000-scale Landslides from Geologic Mapping
- Miscellaneous Landslides
- Watershed Analysis Landslides
- Reconnaissance-level Landslide Mapping

Okanogan Conservation District

Voluntary Stewardship Program

Appendix C: Critical Areas Designations

Wetland

Definition:

Areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. However, wetlands may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversions of wetlands.

Designation and Mapping:

Wetlands are those areas that meet the definition above, as provided in RCW 36.70A.030(21). All areas within Okanogan County meeting the wetland definition are designated critical areas and are subject to the provisions of this title. The 1987 Corps of Engineers Wetlands Delineation Manual, and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, and Western Mountains, Valleys, and Coast Region, as appropriate, will be used to identify wetland characteristics for identification and delineation purposes.

The following clarifications guide the application of the wetland definition:

> (a) Due to the inherent design of most irrigation systems, such systems are reasonably and foreseeably expected to result in some leakage or seepage. Such leakage or seepage is a normal result of utilization of irrigation systems and is deemed for the purposes of this title to be a non-regulated, artificial wetland.
>
> (b) The approximate location and extent of wetlands are shown on the National Wetland Inventory, produced by the US Fish and Wildlife Service. Soil maps produced by United States Department of Agriculture National Resources Conservation Service are also useful in helping to identify potential wetland areas. These maps are to be used as a guide for Okanogan County, project applicants and/or property owners, however, on-the-ground evaluation of potential wetlands is necessary for an accurate designation.

Classification/ Rating System

Wetlands shall be classified and rated according to the criteria and procedures set forth in the Washington State Wetland Rating System for Eastern Washington", (Publication #04-06-015).

The National Wetland Inventory is an estimate of potential wetland locations, and should be used as a suggestion of wetland potential. If mapped wetland demarcations conflict with the designation and classification criteria, the criteria shall take precedence.

Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas include:

(1) Areas within which State and Federal endangered, threatened or sensitive species have a primary association and are designated as critical areas. State listed species are those native fish and wildlife species legally designated as Endangered (WAC 232-12-014), Threatened (WAC 232-12-011) or Sensitive (WAC 232-12-011) by the Washington Fish and Wildlife Commission. Federal listed Threatened, Endangered or Sensitive species means all species of wildlife listed as such by the United States Secretary of the Interior or Commerce.
(2) Priority Habitat and Priority Species Areas identified by the Washington Department of Fish and Wildlife;
(3) Habitat and species of local concern that have been designated by the County;
(4) Waters of the state as defined by WAC 222-16;
(5) Lakes, ponds, streams and rivers planted with game fish by a governmental or tribal entity;
(6) State Natural Area Preserves and Natural Resource Conservation Areas, and other State and Federal lands designated for wildlife (wildlife areas, mitigation areas, wildlife areas).

Priority Habitat and Species are coarsely mapped by the Washington Department of Fish and Wildlife, and can be used as a reference to estimate habitat and species location. However, an on-the-ground evaluation of mapped and unmapped areas will more accurately determine if a location has the qualities appropriate to PHS habitat and species.

Frequently Flooded Areas

Frequently Flooded Areas include the 100-year floodplain as indicated in Flood Insurance Rate Maps produced by the Federal Emergency Management Agency (FEMA). These maps are subject to updates by FEMA. Maps are stored electronically by the Okanogan County Office of Planning and Development and are available through the FEMA Flood Map Service Center.

Geologically Hazardous Areas

Geologically Hazardous Areas shall be designated consistent with the definitions provided in WAC 365-190-080(4). Geologically Hazardous Areas include;) Erosion Hazards;) Landslide Hazards; and) Mine Hazards. Geologically Hazardous Areas also includes Channel Migration Zones.

Erosion hazard areas are those areas that contain all three of the following characteristics:

1) A slope of 30 percent or greater;
2) Soils identified by the Natural Resource Conservation Service (NRCS) as unstable and having a high potential for erosion;
3) Areas that are exposed to the erosion effects of wind or water. (Ord. 94-2 § 2, 1994).

Channel Migration Zones

Channel Migration Zones are those areas subject to risk from lateral channel movement due to stream bank destabilization, rapid stream channel changes (i.e. avulsions), stream bank erosion, and/or shifts in location of stream channels, as shown on Okanogan County's Channel Migration Zone Hazard maps.

1) The Channel Migration Zone (CMZ) is comprised of two areas defined as severe and moderate channel migration zones as outlined in the Channel Migration Study completed for Okanogan County.
   a) Severe Channel Migration Zone: A severe CMZ is designated within the boundaries of the HMZ; within the AHZ; or within the channels probable EHZ as predicted to occur within the next 50 years and as measured in either direction from the outside edge of either the HMZ or AHZ as defined above, whichever is furthest from the river.
   b) Moderate Channel Migration Zone: A moderate channel migration zone is designated when it lies outside the severe hazard channel migration zone and within the FEMA 100-yr floodplain boundary.
2) When a natural geologic feature will affect the predicted migration, the zone width shall be modified to consider such natural constraints; and
3) When structures such as arterial roads or flood hazard reduction facilities are likely to be protected from future bank erosion due to existing programs for public maintenance, the zone width may be modified to the boundary of such structures.

   Channel Migration Zone maps for the Methow River and Okanogan Rivers are on file with the Okanogan County Office of Planning and Development

Critical Aquifer Recharge Areas

Critical aquifer recharge areas are areas of critical recharging effect on aquifers used for potable water. Designated critical aquifer recharge areas will include the Duck Lake Management Area as delineated in WAC 173-132. Group A and Group B public wells, as delineated by the Washington State Department of Health.

As new information becomes available on CAO designations this section may be updated along with any updates the County makes when updating CAO designations.

Appendix D. Critical Area Data

Impaired Water Bodies

2017 Impaired Water Bodies of Okanogan County WA Dept. of Ecology	
Waterbody Name	**Impairment**
Antoine Creek	4,4'-DDT, 4,4-DDE, pH, DDT (and metabolites)
Beaver Creek	Instream Flow
Bonaparte Creek	Bacteria, Temperature, PH, Bacteria
Chewuch River	Temperature, Instream Flow
Chiliwist Creek	pH
Columbia River	Dioxin
Columbia River (Franklin D. Roosevelt Lake)	Total Dissolved Gas
Columbia River (Lake Pateros)	Temperature Total Dissolved Gas
Columbia River (Rufus Woods Lake)	Temperature, Total Dissolved Gas, Dissolved Oxygen
Conconully (Salmon) Lake	Invasive Exotic Species
Conconully Reservoir	Invasive Exotic Species
Conners Lake	Arsenic, Inorganic
Early Winters Creek	Instream Flow
Elgin Creek	DDT (and metabolites), 4,4'-DDT, 4,4'-DDE
Johnson Creek	pH
Loup Loup Creek	Dissolved Oxygen, Temperature, pH
Methow River	Instream Flow, pH, Instream Flow, Temperature, 2,3,7,8-TCDD (Dioxin), Instream Flow, Temperature,
Molson Lake	Polychlorinated Biphenyls (PCBs)
Mosquito Creek	DDT (and metabolites), 4,4'-DDE
Ninemile Creek	4,4'-DDE, Dissolved Oxygen, DDT (and metabolites), pH
Okanogan River	4,4'-DDD, Dissolved Oxygen, 4,4'-DDT, Polychlorinated Biphenyls (PCBs), 4,4'-DDE, Temperature, pH
Osoyoos Lake	Invasive Exotic Species, 4,4'-DDE, 4,4'-DDD
Palmer Creek	Arsenic, Invasive Exotic Species
Salmon Creek	Instream Flow
Similkameen River	Polychlorinated Biphenyls (PCBs), Arsenic, 4,4'-DDE, Temperature,
Sinlahekin Creek	Dissolved Oxygen, Temperature, pH, Bacteria
Siwash Creek	pH
Tallant Creek	DDT (and metabolites), Temperature, pH
Toats Coulee Creek	Temperature
Tonasket Creek	DDT (and metabolites), 4,4'-DDE, Dissolved Oxygen, 4,4'-DDT, pH
Tunk Creek	Bacteria, pH
Twisp River	Instream Flow
Whitestone Lake	Invasive Exotic Species
Wolf Creek	Instream Flow

Water Quality Impairment Descriptions

Water Quality Parameter	Definition	Potential Agriculture-related Source	Problems Caused
Ammonia-N	NH3 (unionized ammonia) and NH4+ (ionized ammonia) makeup TAN (total ammonia nitrogen)	Agricultural fertilizers Livestock waste Ammonia containing cleaning products On-lot septic systems Atmospheric deposition	Can be toxic to aquatic life Highly toxic to freshwater invertebrates
Arsenic, organic and inorganic	Naturally occurring component of the earth's crust	Arsenic rich geothermal fluids contact with surface water Mining or mining related activities	Organic arsenic is less harmful to health. Inorganic arsenic is highly toxic. Possible inhibition of growth, photosynthesis and reproduction Possibly lethal
Bacteria (fecal coliform)	Coliform bacteria, component of microbiology of intestinal tract of mammals	Wastewater treatment plant discharges Failing septic systems Animal waste	Reduce dissolved oxygen, negatively affecting fish Can indicate the presence of pathogens in the water
Cadmium	Naturally occurring element	Mining Smelting Phosphate fertilizers Sewage sludge Industrial use Zinc production	Can inflict mortality, adverse effects on growth, reproduction, immune and endocrine systems, development and behavior in aquatic organisms
Chromium	Odorless and tasteless metallic element	Erosion of natural chromium deposits Industrial processes via leakage, poor storage, inadequate disposal practices	Acute toxicity to invertebrates and fish possible if high concentrations occur
DDT (and metabolites)	Insecticide	Insecticide application Erosion of contaminated soils Elevated loads of suspended solids that are the result of sediment re-suspension	Highly toxic to aquatic animals Highly toxic to fish, they have a poor ability to detect DDT in water The half-life of DDT in an aquatic environment is about 150 years
4,4'-DDE	Breakdown product of DDT	–	–
Dieldrin	Chemical compound used as an insecticide	Breakdown of Aldrin compound in environment Can remain in sediments in the bottom of bodies of water	Have negative effects on nervous systems Toxic in high levels Possibly deadly in high levels
Dioxin	Biproduct of chlorinated organic compounds	Application of some herbicides (most exposures happened decades ago) Burning of waste or fuels like wood, oil, or coal	Highly toxic Can cause cancer, reproductive and developmental problems, damage to the immune system, and interfere with hormones
2,3,7,8-TCDD TEQ	The most toxic dioxin compound, comparison for other dioxin compounds	–	–

Dissolved Oxygen	Gaseous oxygen dissolved in water	Excessive algae growth Die-off and decomposition of submerged plants (Carbonaceous Biochemical Oxygen Demand [CBOD])	Low dissolved oxygen aka hypoxia can cause areas where aquatic life can't survive
Heptachlor	Chemical compound used as an insecticide	–	A possible carcinogenic substance
Heptachlor Epoxide	Oxidation product formed from heptachlor by many plant and animal species	–	Can cause reproductive problems
Invasive Exotic Species	Nonindigenous species that threaten the diversity of abundance of native species	Unintentional and intentional means of introductions such as hitchhiking insects and unwanted pets released into the wild	Can serve as vectors for human diseases Changing fish habitat and clogging waterways Cause soil erosion Cause damage and increased maintenance costs to power plants and industrial water systems Cause extinction of native species
pH	Measure of acidity or baseness, water with a pH less than 7 is considered acidic and water with a pH greater than 7 is considered basic	pH can be affected by bedrock and soil composition The amount of plant growth and organic material decomposing can cause an influx of carbonic acid Dumping of chemicals into the water by individuals, industries and communities Acid rain	Acidic water can cause: * Fish to be more susceptible to fungal infections and other problems Higher solubility of heavy metals Give water a metallic or sour taste Basic/alkaline water can cause: * Damaged gills and skin of aquatic organisms * Eutrophic bodies of water Changes in pH can kill aquatic life that are used to a specific pH
Polychlorinated Biphenyls (PCBs)	Man-made organic chemicals consisting of carbon, hydrogen, and chlorine atoms	Poorly maintained hazardous waste sites that contain PCBs Illegal or improper dumping of PCB wastes Leaks or releases from electrical transformers containing PCBs Disposal of PCB-containing consumer products into municipal or other landfills not designed to handle hazardous waste Burning some wastes in municipal and industrial incinerators	Can cause cancer Negatively effects immune system, reproductive system, nervous system, endocrine system Negative dermal and ocular effects Elevated blood pressure, serum triglyceride and serum cholesterol
Sediment Bioassay	The use of biological organisms to test for chemical toxicity.	–	–

Temperature	A measure of the warmth or coldness of an object or substance with reference to some standard value.	Low instream flows can cause increased water body temperatures Other factors that can influence water temperature: Sunlight Atmosphere Turbidity Confluence Thermal pollution Deforestation impoundments	Fish need cold water to survive, warm temperatures of water are contributing factors for fish decline As temperature increases, the solubility of oxygen and other gases decrease Temperature fluctuations can also affect the behavior choices
Total Dissolved Gas	Air dissolved into water	Dam sluicing Algae bloom Temperature changes Naturally high levels of nitrogen Water pump inlets that suck air	Supersaturation above 110% can cause gas bubble disease trauma in fish Not enough dissolved gases cause death in aquatic life
Total Phosphorous	Amount of phosphorous in water	Natural processesPartially treated and untreated sewageRunoff from agricultural sitesApplication of some lawn fertilizers	EutrophicationBlue-green algae toxicity
Turbidity	The measure of relative clarity of a liquid	Erosion Growth of phytoplankton Storm water runoff Human activities such as construction, mining and agriculture can contribute to turbidity	Reduce aesthetic quality of lakes and streams Increase the cost of water treatment for drinking and food processing Harm fish and other aquatic life by reducing food supplies, degrading spawning beds, and affecting gill function
Zinc	Naturally occurring element	Mining Smelting Steel production Burning coal Improper disposal of zinc-containing wastes Areal desposition	Toxicosis can occur over the long term Possible carcinogenicity
Instream Flow	A water right for the stream measured in a range, usually changing month-to-month instead of a single number	Drought Over drawing of water from waterways Seasonal variation	Low instream levels can affect habitat for fish and wildlife, groundwater and surface water levels, water quality, scenic and aesthetic qualities of natural settings Can also affect water uses related to farming, industry and domestic water supplies

State Listed Species and found in Okanogan County, February 2017

Federal listed status in parentheses: Federal Endangered (FE), Proposed Endangered (FPE), Threatened (FT), Proposed Threatened (FPT) Candidate (FC), or Species of Concern (FSC). The VSP work plan will focus on protecting Federal and State listed Endangered, Threatened and Sensitive species.

STATE LISTED SPECIES		
ENDANGERED	**THREATENED**	**SENSITIVE**
A species native to the State of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state.	A species native to the state of Washington that is likely to become endangered within the portion of its range within the foreseeable future through a significant portion of its range within the state without cooperative management or removal of threats.	A species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or removal of threats.
MAMMALS Gray Wolf (FE) Grizzly Bear (FT) Lynx (FT) Fisher (FSC) **BIRDS** Sandhill Crane Northern Spotted Owl (FT) **INSECTS** Mardon Skipper (FSC) **REPTILES AND AMPHIBIANS** Oregon Spotted Frog (FT)	**MAMMALS** Western Gray Squirrel **BIRDS** Greater Sage-Grouse (FSC) Columbian Sharp-tailed Grouse American White Pelican	**BIRDS** Common Loon **FISH** Pygmy Whitefish

STATE CANDIDATE SPECIES		
A species native to the state of Washington that may warrant future protection under Endangered Species Act (ESA).		
MAMMALS Townsend's Big-eared Bat White-tailed Jackrabbit Wolverine (FC) **BIRDS** Western Grebe Clark's Grebe Northern Goshawk Golden Eagle Yellow Billed Cuckoo (FT) Flammulated Owl Burrowing Owl Sagebrush Sparrow	**BIRDS** Vaux's Swift Lewis Wood Pecker White-headed Woodpecker Black-backed Woodpecker Pileated Woodpecker Loggerhead Shrike Sage Thrasher Sagebrush Sparrow **REPTILES AND AMPHIBIANS** Sagebrush Lizard Western Toad Rocky Mountain Tailed Frog Columbia Spotted Frog	**FISH** Spring Chinook salmon (Upper Columbia) (FE) Steelhead (Upper Columbia) (FT) Bull Trout (FT) Lake Chub Leopard Dace Umatilla Dace **MOLLUSKS** Ashy (Columbia) Pebblesnail **INSECTS** Juniper Hairstreak Silver-bordered Fritillary

Other PHS Species and Habitats

MAMMALS	FISH	BIRDS	HABITATS
Bighorn Sheep	Pacific Lamprey	Barrow's Goldeneye	Aspen Stands
Marten	White Sturgeon	Black Tern	Cliffs/bluffs
Mountain Goat	Coho	Canada Goose	Instream Habitat
Mule Deer	Kokanee	Cavity-nesting Ducks	Islands
Northwest White-tailed Deer	Rainbow Trout	Chukar	Sand Dunes
Rocky Mountain Elk	Inland Redband Trout	Dusky Grouse	Shrub-steppe
	Sockeye Salmon	Eared Grebe	Talus Slopes
	Westslope Cuthroat	Great Blue Heron	Wetlands
		Harlequin Duck	
		Long-billed Curlew	
		Prairie Falcon	
		Waterfowl Concentrations	
		Western Bluebird	
		Wild Turkey	

State and Federal endangered, threatened and sensitive species lists are updated periodically and the most recent information can be found on the Washington Department of Fish and Wildlife website (www.wdfw.wa.gov). The following list is a summary of Okanogan County species with State listings changed between 2011 and 2017.

Species	2011	2017
Lynx	State Threatened	State Endangered
American White Pelican	State Endangered	State Threatened
Bald Eagle	State Sensitive	Removed

Several species were removed from the Federal listings: Columbian Sharp-tailed Grouse, Western Gray Squirrel, Townsend's Big-eared Bat, Sagebrush Lizard, Western Toad, Rocky Mountain Tailed Frog

Notes about WDFW Priority Habitat and Species Data:

A species may be listed if the habitat with which it is primarily associated exists in the County, but no observations of the species has occurred. Over time, species can naturally change their distribution and move to new counties where usable habitat exists. As new information becomes available, known distribution for some species may expand or contract. WDFW will periodically review and update the distribution maps in PHS list.

Appendix E: Baseline Condition Summary

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 Okanogan County VSP Work Plan, Section 5: Goals and Benchmarks.

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 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), and parcel data from the Okanogan County Assessor's Office (2016). 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 based on Okanogan County 1994 CAO, with additional designations to meet current CAO requirements. These designations were developed with County staff based on CAO draft updates and State recommendations.
  - Data sources for planning-level critical areas mapping (Appendix B: Map Folio) and critical area/agricultural intersections summaries (detailed below) ranged from 2009 to 2016 and were acquired from various programs and agencies. 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 B) 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.

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
Streams and Rivers Data	2015	DNR
Water Erosion Potential	2015	NRCS
Wind Erosion Susceptibility	2015	NRCS
Okanogan County Assessor Parcel data	2016	Okanogan County
Public Lands (Gap Analysis Program)	2016	USGS
Landslide Inventory	2017	DNR

Summary of Agriculture and Critical Areas Overlap

The following tables summarize mapped agricultural land acreage in Okanogan County and the percent of farmed acres (as mapped) which overlap with mapped critical areas. The acreages denoted for Dryland, Irrigated and Rangeland agriculture were used in each critical area percent calculation (23,838, 48,435, and 427,863, respectively).

Tables are presented in the following order:

Agricultural Activity and Products on Private Lands in Okanogan County

Agricultural Type	Acres	% of Private Land*	Primary Crops/Livestock
Dryland	23,838	3%	Cereal grains, Hay/Pasture, Oilseed
Irrigated	48,435	6%	Orchard, Hay/Pasture
Rangeland	427,863	49%	Cattle, Horses, Sheep
Total	**500,136**	**57%**	

Sources: USDA Census of Agriculture (2012), WSDA Cropland Data (2011), Okanogan County Parcel Data (2011)

*872,833 acres of private land in Okanogan County

Agricultural Activity on Private Lands in Okanogan County, Excluding Land Within the Colville Reservation

Agricultural Type	Acres	% of Private Land*
Dryland	10,833	1%
Irrigated	40,286	5%
Rangeland	352,118	48%
Total	**403,237**	**55%**

Sources: USDA Census of Agriculture (2012), WSDA Cropland Data (2011), Okanogan County Parcel Data (2011)

*738,988 acres of private land in Okanogan County, excluding all land within the Colville Reservation Boundary

Fish and Wildlife Habitat Data

Priority Habitats and Species (PHS) on Private Agricultural Lands*

Agricultural Type	Acres Overlap PHS	PHS Overlap % of Ag Type
Dryland	3,278	30%
Irrigated	11,786	29%
Rangeland	220,651	63%
Total	**235,715**	**58%**

Source: WA Department of Fish and Wildlife (2016)
*Excludes all land within the Colville Reservation Boundary due to lack of available data

Game Priority Habitats and Species (PHS) on Private Agricultural Lands*

Agricultural Type	Acres Overlap Non-Game PHS	Non-Game PHS Overlap % of Ag Type
Dryland	2,420	22%
Irrigated	10,334	26%
Rangeland	196,411	56%
Total	**209,165**	**52%**

Source: WA Department of Fish and Wildlife (2016)
*Excludes all land within the Colville Reservation Boundary due to lack of available data

Non-Game Priority Habitats and Species (PHS) on Private Agricultural Lands*

Agricultural Type	Acres Overlap Non-Game PHS	Non-Game PHS Overlap % of Ag Type
Dryland	1,359	13%
Irrigated	5,445	14%
Rangeland	59,621	17%
Total	**66,425**	**16%**

Source: WA Department of Fish and Wildlife (2016)
*Excludes all land within the Colville Reservation Boundary due to lack of available data

Habitats of Endangered, Threatened, and Sensitive (ETS) Species on Private Agricultural Lands*

Agricultural Type	Acres Overlap ETS Species	ETS Species Overlap % of Ag Type
Dryland	575	5%
Irrigated	4,653	12%
Rangeland	53,274	15%
Total	**58,502**	**15%**

Source: WA Department of Fish and Wildlife (2016)
*Excludes all land within the Colville Reservation Boundary due to lack of available data

Endangered, Threatened, and Sensitive (ETS) Fish-Bearing Streams Near Private Agricultural Lands*

Agricultural Type	Miles of ETS Fish-Bearing Streams Near Agricultural Land
Dryland	21
Irrigated	60
Rangeland	91
Total	**141****

Source: WA Department of Fish and Wildlife (2016)
*Excludes all land within the Colville Reservation Boundary
**Excludes overlap of agricultural types caused by differing agricultural types on either side of each stream.

Endangered, Threatened, and Sensitive (ETS) Fish Habitat Near Private Agricultural Lands*

Agricultural Type	Acres Within 100 ft of ETS Fish Habitat
Dryland	46
Irrigated	324
Rangeland	1,724
Total	**2,094**

Source: WA Department of Fish and Wildlife (2016)
*Excludes all land within the Colville Reservation Boundary

Priority Habitat and Species - Wildlife
General Location

- Covers much of Okanogan County, but there is a lack of data on Colville Reservation.
- Mostly bird and mammal habitat on a variety of land types, including wetlands, riparian areas, shrub-steppe, and forests.

Intersections with Ag Lands

- Mostly on rangeland.
- Most prominent species are game species, including mule deer and Northwest white-tailed deer. Other game species present are bighorn sheep, mountain goat, waterfowl, and upland birds.
- Most common endangered, threatened, and sensitive species include sharp-tailed grouse, bald eagle, and Western gray squirrel.

Priority Habitat and Species - Fish
General Location

- Along the Okanogan and Methow Rivers and their tributaries.
- Includes only endangered, threatened, and sensitive species: bull trout, Spring chinook, Summer steelhead, and pygmy whitefish.

Intersections with Ag Lands

- Mostly along the Okanogan and Methow Rivers.
- Includes all four endangered, threatened, and sensitive species: bull trout, Spring chinook, Summer steelhead, and pygmy whitefish.

Wetlands and Agriculture Overlap

Wetlands on Private Agricultural Lands*

Agricultural Type	Acres Overlap Wetlands	PHS Overlap % of Ag Type
Dryland	679	6%
Irrigated	1,924	5%
Rangeland	14,744	4%
Total	**17,347**	**4%**

Source: USFWS National Wetlands Inventory

* Excludes land on Colville Reservation

General Location

- Concentrations near Similkameen River, Sinlahekin River, Upper Okanogan River, Nespelem River, Upper Methow River, and Twisp River.

Intersections with Ag Lands

- Mostly on rangeland.
- High overlap near Similkameen River, Sinlahekin River, and Upper Okanogan River.

Critical Aquifer Recharge Areas and Agriculture Overlap

Wellhead protection areas data came from the Department of Health. The assigned data was a standard 1,000-foot radius because DOH had little to no data to do a model. B wells were less likely to be assigned because they have more data for the A wells. There is no data for single family wells and farm wells because they are exempt for wellhead protection areas. The 6-month, 1 year, 5 year, and 10 year wellhead protection areas were calculated either by a model or a hydrologist.

Assigned Well Head Protection Areas on Private Agricultural Lands

Agricultural Type	Acres Overlap WHPA	WHPA Overlap % of Ag Type
Dryland	73	0%
Irrigated	3,682	9%
Rangeland	2,336	1%
Total	**6,091**	**10%**

6 Months Well Head Protection Areas on Private Agricultural Lands

Agricultural Type	Acres Overlap WHPA	WHPA Overlap % of Ag Type
Dryland	24	0.142%
Irrigated	105	0.262%
Rangeland	53	0.015%
Total	**182**	**0.420%**

1 Year Well Head Protection Areas on Private Agricultural Lands

Agricultural Type	Acres Overlap WHPA	WHPA Overlap % of Ag Type
Dryland	69	0%
Irrigated	264	1%
Rangeland	133	0%
Total	**466**	**1%**

5 Year Well Head Protection Areas on Private Agricultural Lands

Agricultural Type	Acres Overlap WHPA	WHPA Overlap % of Ag Type
Dryland	267	2%
Irrigated	1,370	3%
Rangeland	1,061	0%
Total	**2,698**	**5%**

10 Year Well Head Protection Areas on Private Agricultural Lands

Agricultural Type	Acres Overlap WHPA	WHPA Overlap % of Ag Type
Dryland	494	3%
Irrigated	2,916	7%
Rangeland	2,899	1%
Total	**6,309**	**11%**

All Years Well Head Protection Areas on Private Agricultural Lands

Agricultural Type	Acres Overlap WHPA	WHPA Overlap % of Ag Type
Dryland	913	5%
Irrigated	6,092	15%
Rangeland	5,068	1%
Total	**12,073**	**22%**

Sources: WSDA Cropland Data (2015), Okanogan County Parcel Data (2011), USDA Census of Agriculture (2012), Washington State Department of Health, Office of Drinking Water and Division of Information Resource Management (2015)

Geologically Hazardous Areas Agricultural Overlap

Approximately 19, 821 acres of agricultural overlap with any Geologic Hazards (steep slopes, CMZ, FHZ, DNR landslides). The following data describes overlap for individual hazards. Some ag land overlaps with more than one hazard.

Agricultural Overlap with mapped Channel Migration Zones (CMZ)

Agricultural Type	Acres Overlap	CMZ % Overlap
Irrigated	177	0.4%
Dryland	10	0.0%
Rangeland	312	0.1%
Total	**499**	**0.5%**

Agricultural Overlap with mapped Channel Migration Zones (FHZ)

Agricultural Type	Acres Overlap	FHZ % Overlap
Irrigated	638	1.3%
Dryland	75	0.3%
Rangeland	1,307	0.3%
Total	**2,020**	**3.8%**

Agricultural Overlap with Steep Slopes (greater than 30%)

Agricultural Type	Acres Overlap	% Overlap
Irrigated	3	0%
Dryland	1	0%
Rangeland	16,215	4%
Total	**16,219**	**3.8%**

Agricultural Overlap with DNR Mapped Landslides

Agricultural Type	Acres Overlap	% Overlap
Irrigated	133	0%
Dryland	2	0%
Rangeland	1,253	0%

Frequently Flooded Areas Agriculture Overlap

The frequently flooded areas data originated from FEMA flood hazard mapping and was edited by the Okanogan County Planning Office (2011). FEMA flood hazard mapping is a product that shows the risk of an area flooding in a 100-year flood event. Approximately 6,635 acres of private agricultural land overlaps with FEMA floodplains.

Agriculture Overlap with mapped FEMA floodplain

Agricultural Type	Acres Overlap	% Overlap
Irrigated	2,842	6%
Dryland	317	1%
Rangeland	3,476	0%
Total	**6,635**	**1%**

Sources: USDA Census of Agriculture (2012), WSDA Cropland Data (2011), Okanogan County Parcel Data (2011), Okanogan County Planning (2011).

Watershed Areas

Watersheds were grouped into three regions and agricultural data and implemented practices was evaluated. These regions were designated for analysis purposes only.

Name	Percentage of the County	WRIA
East Okanogan	16%	60-Kettle, 52-Sanpoil, 51-Nespelem, 53-Lower Lake Roosevelt
Okanogan	44%	49-Okanogan, 50-Foster
Methow	40%	49-Methow, 47-Chelan

Methow Watershed Planning Area

Okanogan CD Implemented Practices (2011-2016)

Conservation Practice	# Projects	Amount	
Critical Area Planting	4	1,947	acres
Fence	17	99,746	feet
Dike	11	3,650	feet
Stream Crossing	3	3	crossings
Watering Facility	2	2	facilities

*total of 37 OCD projects were done between 2011-2016 in the Methow watershed planning area.

Agriculture on Private Land (2011)

Ag Type	Acres
Irrigated	6,963
Dryland	587
Rangeland	34,516
Total	**42,066**

*8% of private Agriculture land is in the Methow watershed planning area.

Okanogan Watershed Planning Area

Okanogan CD Implemented Practices (2011-2016)

Conservation Practice	# Projects	Amount	
Critical Area Planting	7	1,370	acres
Cover Crop	5	55	acres
Fence	11	47,975	feet
Stream Habitat Improvement	2	9,000	feet
Dike	2	800	feet
Watering Facility	4	5	facilities
Animal Mortality Facility	2	2	facilities
Fish Screen	70	98	screens

*total of 103 OCD projects were done between 2011-2016 in the Okanogan watershed planning area.

Agriculture on Private Land (2011)

Ag Type	Acres
Irrigated	41,024
Dryland	21,836
Rangeland	335,891
Total	**398,751**

*80% of private agriculture land is in the Okanogan watershed planning area.

East Okanogan Watershed Planning Area

Okanogan CD Implemented Practices (2011-2016)

Conservation Practice	# Projects	Amount
Fence	2	14,823 feet
Cover Crop	2	25 acres
Watering Facility	2	2 facilities

*total of 6 OCD projects were done between 2011-2016 in the East Okanogan watershed planning area.

Agriculture on Private Land (2011)

Ag Type	Acres
Irrigated	447
Dryland	1,415
Rangeland	57,442
Total	**59,304**

*12% of private agriculture land is in the East Okanogan watershed planning area.

Appendix F: Key Stewardship Practices Implemented to Protect Critical Areas

The following agricultural practices are commonly applied in Okanogan County and protect or enhance the following critical area functions and values:

- Wetlands (WET)
- Fish and Wildlife Habitat Conservation Areas (HCA)
- Critical Aquifer Recharge Areas (CARA)
- Geologically Hazardous Areas (GHA)
- Frequently Flooded Areas (FFA)

The list is not complete and other conservation practices not listed may be counted towards protecting or enhancing critical area functions and values. A description, standards, and specification of conservation practices can be accessed on NRCS eFOTG website.

https://efotg.sc.egov.usda.gov/treemenuFS.aspx

Stewardship Strategies			Critical Area Protections				
Management Type	**NRCS Code**	**Key Stewardship Practices**	**WET**	**HCA**	**CARA**	**GHA**	**FFA**
Soil Management	328	Conservation Crop Rotation	●	●		●	
	340	Cover Crop	●	●		●	
	329	Residue and Till Management, No Till	●	●		●	●
	580	Stream bank and shoreline Protection	●	●		●	●
	484	Mulching	●	●		●	●
	386	Field Border	●	●		●	●
	650	Windbreak/shelterbelt Renovation	●	●		●	●
Water Management	449	Irrigation Water Management	●	●	●	●	
	442	Sprinkler System	●	●	●	●	
	533	Pumping Plant	●	●			
Nutrient Management	590	Nutrient Management	●	●	●		
	317	Composting Facility	●	●		●	
	316	Animal Mortality Facility	●	●		●	
Pest Management	595	Integrated Pest Management	●	●	●	●	
	315	Herbaceous Weed Control	●	●	●	●	●
Range Management	528	Range Planting	●	●		●	●
	516	Prescribed Grazing	●	●		●	●
	614	Watering Facility	●	●		●	●
	574	Spring Developments	●	●			
	560	Access Road	●	●			
	472	Access Control	●	●	●	●	●
	528	Managed Grazing	●	●	●	●	●
	561	Heavy Use Protection Area	●			●	●
	314	Brush Management	●	●	●	●	●
	327	Conservation Cover	●	●	●	●	●
	511	Forage Harvest Management		●			

Stewardship Strategies			Critical Area Protections				
Management Type	**NRCS Code**	**Key Stewardship Practices**	**WET**	**HCA**	**CARA**	**GHA**	**FFA**
Habitat Management	327	Conservation Cover	●	●		●	●
	342	Critical Area Planting	●	●	●	●	●
	395	Stream Habitat Improvement	●	●		●	●
	612	Tree/Shrub Establishment	●	●		●	●
	643	Restoration of Rare and Declining Habitats	●	●		●	●
	645	Upland Wildlife Habitat Management	●	●		●	●
	584	Channel Stabilization		●		●	
	390	Riparian Herbaceous Cover	●	●		●	●
	NA	Fish Screens	●	●			
	382	Fence	●	●		●	●
	578	Culvert/Bridge/Stream Crossings Upgrades	●	●		●	●
	659	Wetland Enhancement	●	●		●	●
	666	Forest Stand Improvement	●	●		●	●
	391	Riparian Forest Buffer	●	●	●	●	●
	422	Hedgerow planting	●	●	●	●	●
	582	Open Chanel	●	●	●	●	●
	399	Fishpond Management	●	●			
	378	Pond	●	●	●	●	●
	646	Shallow Water Management of Wildlife	●	●		●	●
	649	Structures for Wildlife	●	●			
	659	Wetland Restoration	●	●	●	●	●
	644	Wetland Wildlife Habitat Management	●	●	●	●	●
	322	Channel Bank Vegetation	●	●	●	●	●
	396	Fish Passage	●	●	●	●	●
	384	Woody Residue Treatment	●	●	●	●	●

Summary of Stewardship Practices Implemented by Agricultural Producers

Stewardship Strategies		Data (2011-2016)
Type	**Key Stewardship Practices**	**Average Practice installed**
Soil Management	• Conservation Crop Rotation • Cover Crop	519 ac 36,156 sq ft
Water Management	• Irrigation Water Management • Sprinkler System	4,562.5 ac. 30 no.
Nutrient Management	• Nutrient Management • Composting Facility • Animal Mortality Facility	3 no. 2,377 ac.
Pest Management	• Pest Management	21,793 ac.
Residue and Tillage Management	• Residue and Till Management • Mulch Till • Direct Seed	1,742 ac
Range Management	• Range Planting • Prescribed Grazing • Watering Facility/livestock pipeline • Spring Developments	187,447 ac 97,495 ft 118 no.
Habitat Management	• Conservation Cover • Stream Habitat Improvement • Riparian Herbaceous Cover • Tree/Shrub Establishment • Restoration of Rare and Declining Habitats • Upland Wildlife Habitat Management • Channel Stabilization • Obstruction Removal	34,029.1 ac. 12,905.5 ft 27.12 mi treated/opened
	• Fish and Wildlife Structure	10 no.
	• Fence	297,587 ft
	• Fish Screens	100 no.
	• Culvert/Bridge/Stream Crossings Upgrades	22 no.
Water Savings	• Washington Water Trust	15,003 ac ft & 11.47 cfs
Conservation Easements	• Okanogan Land Trust • Methow Conservancy	7,163.58 ac.
OCD Fire Recovery (Special Funds)		
Range Management	• Access Road • Emergency Livestock Feed	118 ft 1 no. $500,000
Habitat Management	• Fence • Dike	135,998 ft
Water Management	• Water Well	1 no.

Description of Common NRCS Practices

Practice	Code	Description
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and/or equipment from an area.
Access Road	560	An access road is an established route for equipment and vehicles.
Agricultural Energy Management Plan - Written	128	A detailed documentation and inventory of the energy consuming activities and components of the current agricultural operation.
Agricultural Energy Management Plan, Headquarters - Written	122	Contains the strategy by which the producer will explore and address his/her on-farm energy problems and opportunities on the Headquarters.
Agricultural Energy Management Plan, Landscape - Written	124	Contains the strategy by which the producer will explore and address his/her on-farm energy problems and opportunities on the working land.
Animal Mortality Facility	316	An on-farm facility for the treatment or disposal of animal carcasses due to routine mortality.
Channel Bank Vegetation	322	Establishing and maintaining vegetative cover on channel banks, berms, spoil, and associated areas. (No longer a practice)
Channel Bed Stabilization	584	Maintain or alter channel bed elevation or gradient• Modify sediment transport or deposition• Manage surface water and groundwater levels in floodplains, riparian areas, and wetlands
Composting Facility	317	A structure or device to contain and facilitate the controlled aerobic decomposition of manure or other organic material by microorganisms into a biologically stable organic material that is suitable for use as a soil amendment.
Conservation Cover	327	Establishing and maintaining permanent vegetative cover
Conservation Crop Rotation	328	A planned sequence of crops grown on the same ground over a period of time (i.e. the rotation cycle).
Cover Crop	340	Grasses, legumes, and forbs planted for seasonal vegetative cover.
Critical Area Planting	342	Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.
Dike	356	A barrier constructed of earth or manufactured materials to protect people and property from floods and/or control water level in connection with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction.
Fence	382	A constructed barrier to animals or people facilitating the accomplishment of conservation objectives by providing a means to control the movement of animals and people, including vehicles.
Fish and Wildlife Habitat Structure	649	A structure installed to replace or modify a missing or deficient wildlife habitat component.

Forage and Biomass Planting	512	Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.
Forest Stand Improvement	666	The manipulation of species composition, stand structure, or stand density by cutting or killing selected trees or understory vegetation to achieve desired forest conditions or obtain ecosystem services.
Heavy Use Protection Area	561	Heavy Use Area Protection is used to stabilize a ground surface that is frequently and intensively used by people, animals, or vehicles.
Hedgerow Planting	422	Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.
Integrated Pest Management (IPM)	595	A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
Irrigation Pipeline	430	A pipeline and appurtenances installed to convey water for storage or application, as part of an irrigation water system.
Irrigation System, Microirrigation	441	An irrigation system for frequent application for small quantities of water on or below the soil surface: as drops, tiny streams, or miniature spray through emitters or applicators placed along a water delivery line.
Irrigation System, Sprinkler	442	A distribution system that applies water by means of nozzles operated under pressure.
Irrigation Water Conveyance	430DD	*See Irrigation Pipeline
Irrigation Water Management	449	The process of determining and controlling the volume, frequency, and application rate of irrigation water for water and power efficiency.
Livestock Pipeline	516	A pipeline and appurtenances installed to convey water for livestock or wildlife.
Mulching	484	Applying plant residues or other suitable materials to the land surfaces.
Nutrient Management	590	Managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments.
Obstruction Removal	500	Removal and disposal of buildings, structures, other works of improvement, vegetation, debris or other materials.
Open Channel/Bridge	582	Construct, improve, or restore an open channel to convey water required for flood prevention, drainage, wildlife habitat protection or enhancement, or other authorized water management purpose.
Pipeline	516	Pipeline having an inside diameter of 8 inches or less.
Prescribed Grazing	528	Guidance for the planning and implementation of prescribed grazing on rangeland, pastureland, riparian areas, forestland, dormant season grazing, and winter feed areas. Prescribed grazing is managing the harvest of plants by the grazing animal.
Pumping Plant	533	A facility that delivers water at a designed pressure and flow rate. Includes the required pump(s), associated power unit(s), plumbing, appurtenances, and may include on-site fuel or energy source(s), and protective structures.
Range Planting	550	Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees.

Residue and Tillage Management, No-Till	329	Limiting soil disturbance to manage the amount, orientation and distribution of crop and plant residue on the soil surface year around.
Restoration and Management of Rare and Declining Habitats	643	Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems
Seasonal High Tunnel System for Crops	798	A seasonal polyethylene covered structure with possible electrical, heating, and/or mechanical ventilation systems that is used to cover crops to extend the growing season in an environmentally safe manner.
Silvopasture Establishment	381	An application establishing a combination of trees or shrubs and compatible forages on the same acreage.
Spring Development	574	Collection of water from springs or seeps to provide for livestock and wildlife.
Stream Crossing	578	A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles.
Stream Habitat Improvement	395	Maintain, improve or restore physical, chemical and biological functions of a stream, and its associated riparian zone, necessary for meeting the life history requirements of desired aquatic species.
Streambank and Shoreline Protection	580	Treatment(s) used to stabilize and protect banks of streams or constructed channels, and shorelines of lakes, reservoirs, or estuaries.
Structure for Water Control	587	A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water.
Tree/Shrub Establishment	612	Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration.
Tree/Shrub Pruning	660	The removal of all or parts of selected branches, leaders or roots from trees and shrubs.
Tree/Shrub Site Preparation	490	Treatment of areas to improve site conditions for establishing trees and/or shrubs.
Upland Wildlife Habitat Management	645	Provide and manage upland habitats and connectivity within the landscape for wildlife
Water Well	642	A hole drilled, dug, bored, jetted or otherwise constructed into an aquifer for water supply.
Watering Facility	614	A watering facility is a means of providing drinking water to livestock or wildlife.
Woody Residue Treatment	384	The treatment of residual woody material that is created due to management activities or natural disturbances.
Emergency Livestock Feed		-
Fish Screen		Replaces pumps or screens with compliant screen to reduce fish mortality

Source: NRCS Conservation Practice Standards

Appendix G: Okanogan County Practice Toolbox with CPPE Average Function Scores

NRCS Conservation Practices Physical Effects (CPPE) tool is how Natural Resources Conservation Service practices affect human-economic environment and natural resources. This planning tool provides a quantitative score detailing the magnitude of the practice's effect on the resources. 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. The list of practice below is some of the key practices that can be counted towards VSP in protecting critical areas in Okanogan County. For a complete list of NRCS practices can be found at https://efotg.sc.egov.usda.gov/ and to find a complete list of CPPE scores can be found at https://efotg.sc.egov.usda.gov/treemenuFS.aspx.

Okanogan 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.

CARA = Critical Aquifer Recharge Areas

FFA = Frequently Flooded Areas

GHA = Geologically Hazardous Areas

HCA = Fish and Wildlife Habitat Conservation Areas

WET = Wetland

Appendix H: Okanogan County Stewardship Checklist

Stewardship Checklist is only for the purpose of the Voluntary Stewardship Program and will not be used in any other program or capacity. Stewardship Checklist is subject to change as implementation and adaptive management process occurs.

Okanogan County
Voluntary Stewardship Program

Producer Packet

DRAFT

WHAT IS THE VSP?

Washington's Growth Management Act (Chapter 36.70A RCW) requires all counties to identify and protect critical areas, including critical areas on agricultural lands. The Voluntary Stewardship Program (VSP), offers a voluntary, incentive based approach for counties to meet that requirement.

In 2011, Okanogan County elected to participate in the VSP, along with 26 other counties in Washington. The VSP applies to land where agricultural activities occur, and provides a unique strategy to protect critical areas while also promoting agriculture. The VSP relies on voluntary participation by producers to meet the required protection of critical areas. Rather than creating new regulations, the VSP allows Okanogan County to take credit for the good stewardship that is already practiced by farmers and ranchers, while relying on education, outreach, and voluntary incentive programs to achieve further protection.

Voluntary

The VSP is based on stewardship practices that landowners choose to implement of their own accord. No agricultural operator will be required to participate in voluntary stewardship practices as part of this program, and the program cannot require anyone to discontinue any agricultural activities legally existing before July 22, 2011 (*RCW 36.70A.702 (2)).*

Non-regulatory

The VSP is not a regulatory program, and the completed VSP Work Plan will not be formally adopted by the Okanogan County Commissioners. The VSP does not grant the state or the county any additional regulatory authority (*RCW 36.70A.702 (4)).*

Alternative strategy

For non-agricultural developments, critical areas are already protected under the Okanogan County Critical Area Ordinance, as required by the Growth Management Act (GMA). The VSP serves as an alternative to the regulatory approach of the GMA by allowing Counties to show protection of critical areas through voluntary stewardship measures. If the County chose not to participate in the VSP, or if the Okanogan County VSP Work Plan is not approved, Okanogan County will be required to update its Critical Area Ordinance to protect critical areas with respect to agricultural activities. *RCW 36.70A.700 (2(c)), (RCW 36.70A.735 (1&2)).*

What are Critical Areas?

For further information, see the critical areas designations in the Okanogan County VSP Work Plan.

Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas are lands and waters that provide habitat to fish and wildlife species within their natural geographic distribution. The protection goals of the VSP program specifically address areas where fish and wildlife species have been designated as *endangered*, *threatened*, or *sensitive* by the state or federal government, and areas designated as their primary association. Additional HCAs include habitats and species of local importance, lakes, rivers, streams categorized in water type 1-5, and naturally occurring ponds under 20 acres and their associated aquatic beds.

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 (The current CAO for Okanogan County was adopted in 1994, and a new CAO is being developed to address updated GMA standards).

Critical Aquifer Recharge Areas

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.

Frequently Flooded Areas

Frequently Flooded Areas are floodways and associated floodplains that have a one (1%) percent or greater chance of flooding in any given year. Frequently Flooded Areas are identified based on FEMA Flood Rate Insurance Maps. Most of the Frequently Flooded areas in Okanogan County are found in Okanogan 49 WRIA and Methow 48 WRIA.

Geologically Hazardous Areas

Geologically Hazardous Areas are areas that are susceptible to erosion, sliding, earthquake, or other geological events. In Okanogan County, these include areas with “severe rill” and “inter-rill” erosion hazard, and areas with a 30% or greater slope. Channel erosion and bank erosion a long rivers, streams, and creeks is another concern in Okanogan County.

What are *Agricultural Activities*?

The definition of **agricultural activities** used for VSP is from RCW 90.58.065, and includes the following:

- Producing, breeding, or increasing agricultural products
- Rotating and changing agricultural crops
- Conducting agricultural operations
- Maintaining agricultural lands under production or cultivation
- Maintaining, repairing, and replacing agricultural equipment
- Maintaining, repairing, and replacing agricultural facilities
- Allowing land used for agricultural activities to lie dormant because:
  - the land is enrolled in a local, state, or federal conservation program;
  - the land is subject to a conservation easement;
  - as a result of adverse agricultural market conditions;
- Allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded

STEWARDSHIP CHECKLIST

Promoting Agriculture Viability and Protecting Critical Areas

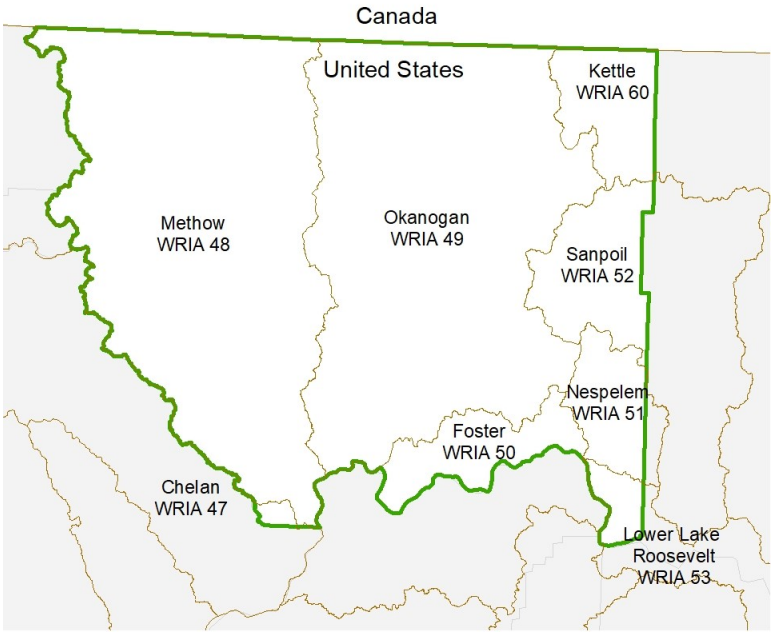
The Voluntary Stewardship Program (VSP) is an optional, incentive-based approach to protecting critical areas while promoting agriculture. This checklist assists in evaluating the goals and benchmarks of the VSP Work Plan and serves as an individual stewardship plan referenced in the VSP law. **The VSP Work Plan aims to achieve protection and enhancement of critical areas through voluntary, incentive based measures by agricultural producers. This means increased flexibility for producers and fewer regulations.** Your time and patience in carefully and accurately filling out this checklist is much appreciated by the VSP Workgroup and Staff.

Provide Location Information

Instructions: Review the definitions of agricultural activities and critical areas. Visually review potential critical areas on or near your property, such as ponds, streams, wet areas, steep slopes, etc.

1. What area is your farm or ranch located within?

- Methow (WRIA 48) ☐
- Chelan (WRIA 47) ☐
- Okanogan River (WRIA 49) ☐
- Nespelem River (WRIA 51) ☐
- Sanpoil River (WRIA 52) ☐
- Lower Lake Roosevelt (WRIA 53) ☐
- Kettle River (WRIA 60) ☐
- Chelan (WRIA 47) ☐



2. Identify potential critical areas intersecting with agricultural activities on your property:

- A. fish and wildlife habitat conservation areas ☐
- B. wetlands ☐
- C. frequently flooded areas ☐
- D. geologically hazardous areas ☐
- E. critical aquifer recharge areas ☐

Note: Checking one or more critical areas that may *potentially* be located on or adjacent to the property does not constitute an official determination of such a feature. It is helpful in filling out the rest of the checklist.

This packet is solely intended to assist in the implementation of the Voluntary Stewardship Program by the Okanogan County VSP Workgroup and Okanogan Conservation District. The information disclosed in this document is not applicable outside of the strictly voluntary nature of VSP, and is not to be used in any regulatory capacity whatsoever.

Management types

Soil Management
Protect and enhance soil health and prevent soil erosion.

Water Management
Protect and enhance surface water quality and limit movement of sediment and other materials into water bodies.

Range Management
Sustaining yields of rangeland while protecting and improving range resources of soil, water, plant, and wildlife.

Habitat Management
Protecting and enhancing natural resources to provide habitat for fish and wildlife species.

What stewardship practices are being implemented on your farm or ranch?

Key Stewardship Practices Examples	I do This	I'm interested in this	Does not apply	Not interested	Average units/year (acres/feet/other)
Soil Management					
Conservation Crop Rotation	☐	☐	☐	☐	
Cover Crop	☐	☐	☐	☐	
Residue and Till Management, No Till	☐	☐	☐	☐	
Mulching	☐	☐	☐	☐	
Water Management					
Irrigation Water Management	☐	☐	☐	☐	
Sprinkler System	☐	☐	☐	☐	
Pumping Plant	☐	☐	☐	☐	
Groundwater testing to determine quality of ground water supply	☐	☐	☐	☐	
Nutrient Management					
Nutrient Management: managing excess nutrients to minimize pollution	☐	☐	☐	☐	
Composting Facility: structure to properly dispose organic matter	☐	☐	☐	☐	
Animal Mortality Facility: facility for disposal of animal carcasses	☐	☐	☐	☐	
Range Management					
Range Planting	☐	☐	☐	☐	
Prescribed Grazing	☐	☐	☐	☐	
Watering Facility	☐	☐	☐	☐	
Spring Developments	☐	☐	☐	☐	
Access Road	☐	☐	☐	☐	
Access Control	☐	☐	☐	☐	
Heavy Use Protection Area	☐	☐	☐	☐	

Key Stewardship Practices Examples	I do This	I'm interested in this	Does not apply	Not interested	Average units/year (acres/feet/other)
Habitat Management					
Conservation Cover	☐	☐	☐	☐	
Critical Area Planting	☐	☐	☐	☐	
Stream Habitat Improvement	☐	☐	☐	☐	
Channel Stabilization	☐	☐	☐	☐	
Tree/Shrub Establishment	☐	☐	☐	☐	
Restoration of Rare and Declining Habitats	☐	☐	☐	☐	
Upland Wildlife Habitat Management	☐	☐	☐	☐	
Fish and Wildlife Structure	☐	☐	☐	☐	
Fish Screens	☐	☐	☐	☐	
Culvert/Bridge/Stream Crossings Upgrades	☐	☐	☐	☐	
Fence	☐	☐	☐	☐	
Pest Management					
Integrated Pest Management	☐	☐	☐	☐	
Other ideas for stewardship practices:					

Fence Markers

Off-channel Watering

Access Control protects water quality and habitat

Stewardship Practice

Stewardship practices (also called conservation practices) are practical methods of agricultural land management or improvements designed to protect or enhance natural resources – soil, water, air, energy, habitat — while allowing efficient and productive use of the land. Visit https://efotg.sc.egov.usda.gov/toc.aspx?CatID=16204 to view NRCS practice standards and definitions.

Step 3: Monitoring

A technical assistance provider, coordinated by Okanogan County Conservation District, will contact you annually about the conservation practices installed. You may request a field visit to obtain feedback on improving the effectiveness of the conservation practices.

Ideas for Agriculture Viability Incentives and Outcomes

The VSP is designed to promote the viability of agriculture over the long term and to avoid unnecessary local critical area regulations. due to the prevalence of conservation practices undertaken by willing producers. Producers may find cost-matching programs with technical providers (see contact information below).

What incentives could help you achieve your goals for your farm?

Education and Technical Assistance

The Okanogan County VSP aims to ensure that adequate education and technical assistance is provided to agricultural operators in Okanogan County.

Do you feel that there is adequate access to educational materials and technical assistance regarding critical areas and agriculture?

- ☐ Yes
- ☐ No

If you answered "No", what additional resources would be helpful?

Other Resources:

Okanogan Conservation District:	https://www.okanogancd.org/
USDA Natural Resources Conservation Service:	https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/
USDA Farm Service Agency:	https://www.fsa.usda.gov/
Methow Conservancy:	http://www.methowconservancy.org/

Critical Area Notes

Use this space to make additional notes about the conditions of any potential critical areas adjacent to your operation. It is best to include a date with each entry.

For Information & Assistance

Lead Technical Assistance Provider: Okanogan Conservation District
https://www.okanogancd.org/ (509)-422-0855

Appendix I: Monitoring Tools

Adapted from Stevens County VSP Work Plan

Aerial Imagery

Aerial imagery can serve as a tool to examine how the landscape changes over. For VSP monitoring, publicly available aerial imagery can be used to assess watershed-scale changes to fish and wildlife habitat conservation areas, floodplains, and steep slopes, and wetlands in relation to agricultural activities. Okanogan County work group has developed a framework for aerial monitoring which is outlined below. This approach is designed to be practical, affordable, reliable, repeatable, and respectful of the privacy of individual landowners. In the future, the monitoring approach may be updated or improved based on available technology, data, and expertise if approved by the VSP Workgroup. While aerial imagery is useful to indicate landscape changes, technical staff will need to interpret these changes in relation to various potential impacts, such as flooding and wildfire effects. Significant impacts to the critical areas have occurred from wildfires in 2014 and 2015. Because of these historic fires, monitoring will have to consider the status of the landscape prior to July 2014 to determine changes to critical areas by agricultural activities. Future natural disasters may also be considered during monitoring and reporting.

Monitoring Vegetation Change with Aerial Imagery

Vegetation is an important indicator of critical area functions and values and also land use conversions related to agricultural viability. Aerial monitoring for VSP is focused on major vegetation changes within key areas of interface between agriculture and critical areas. Using publicly available data and practical analysis techniques to track vegetation changes, baseline monitoring can be conducted for the following critical areas:

- Fish and Wildlife Habitat Conservation Areas (vegetation in riparian areas and land use conversions in critical areas)
- Geologically Hazardous Areas (vegetation on steep slopes)
- Frequently Flooded Areas (vegetation within the 100 year floodplain)

Suggested Software

The following proprietary software is needed for vegetation analysis and summarization of results:

- *ESRI ArcMAP* version 9.0 or higher, with spatial analyst extension
- *Microsoft Office Suite*
- *WinZip Universal* or comparable

Suggested Data Sources

The suggested data sources for conducting vegetation analysis are summarized below. Additional data sources may be used if determined necessary by the Workgroup and VSP technical staff.

Information	Source	Time Period	Notes
Landsat Imagery	USGS	2011, most recent	Landsat 4-5 for 2011, Landsat 8 subsequent.

NAIP Imagery	USDA	2011, most recent	1 meter pixel imagery
County Boundary	Washington DOT	NA	Available via ArcGIS Online
Mapped Streams	Washington DNR	Most recent	Can filter by stream class or SMA designation
Agricultural Activities	WSDA	2011, most recent	Available on request from WSDA
WRIA boundaries	Ecology	Most recent	Available online from Ecology site
PHS Regions	WDFW	2011, most recent	Available on request from WDFW
Steep Slopes	USDA SSURGO	2011, most recent	Filter for slopes > 30%
100-year floodplain	FEMA	2011, most recent	Flood zone A and AE.

Suggested Methodology for Vegetation Monitoring

The proposed method of vegetation monitoring combines multispectral remote sensing with simple visual verification. Lower-resolution (30m pixel) Landsat imagery is used to detect vegetation change over a set time period, while more detailed NAIP imagery is used to verify and inventory the changes that are detected. Generally, images from the 2011 VSP baseline year will be compared to the most recent imagery available. The suggested steps to complete the analysis for any reporting deadline is summarized below:

Task #	Task Description
1	Create appropriate folders to store imagery downloads, and processed imagery.
2	Download NAIP imagery or obtain from Okanogan County GIS department (2011 & year of interest).
3	Download Landsat Imagery (2011 & year of interest (YOI)) for Okanogan County from USGS Earth Explorer https://earthexplorer.usgs.gov. Try to choose dates that correspond with NAIP imagery flyover dates. Unzip files using WinZip or similar program.
5	Create composite rasters for from the individual Landsat band rasters for 2011 and the YOI.
6	Mosaic composite rasters so that there is one composite raster covering the entire county for both 2011 and YOI.
7	Create a Normalized Difference Vegetation Index (NDVI) for the 2011 and YOI.
8	Calculate a new "NDVI change" image showing the difference between the 2011 and the YOI NDVI rasters by subtracting the year of interest NDVI from the 2021 NDVI. r Positive pixel values indicate an increase in green vegetation, negative values indicate a decrease in green vegetation, and values close to '0' indicate little change.
9	Normalize the NDVI change image based on known *unchanged* areas, i.e. rooftops. These areas should have a pixel value near zero.
10	Classify the NDVI change image so that significant positive and negative changes are displayed. Forestry clear-cuts (even if irrelevant to VSP) are a useful "significant change" benchmark to determine classification thresholds.

11	Fact-check the NDVI change image using areas of known vegetation change.
12	Set minimum accuracy threshold for classification of positive and negative changes and conduct ground-truthing or additional analysis to verify that minimum threshold is being met.
13	Clip the NDVI change image to relevant critical areas: • Riparian areas (using standardized offsets from DNR streams) • Steep slopes (30% or greater) • Floodplains
14	Create grid squares that overlay the vegetation changes that occurred on ag lands (WSDA) to allow for systematic visual analysis. Grid squares are NOT used to define specific areas for repeated analysis, they are simply an organizational tool to allow for systematic analysis.
15	Proceeding systematically through each overlayed grid square, use NAIP imagery from 2011 and YOI to confirm NDVI change pixels as *positive*, *negative*, or *not-applicable*. The criteria for a pixel to be *not applicable* should be defined beforehand. Record results in tabular form.

Aerial Monitoring Verification

Aerial analysis will be verified by randomly selecting sites for an on-the-ground visual assessment.

Use the Sampling Design Tool in ESRI ArcMAP to randomly select 25 points throughout the County. Set the tool parameters so that sites are located close to roads to avoid privacy issues and reduce monitoring costs. Each sampling point corresponds to a single pixel in the NDVI Change Raster.

Visit each point and make a determination using professional judgement whether the point has significantly changed since 2011 NAIP imagery. Change will be recorded as more green, less green or not significantly changed since 2011. Cause of change will be estimated.

Land Use Conversions

Land use changes on critical areas will be assessed from the NDVI Change Raster by observing negative and positive pixel values. Positive pixel changes may be related to hydrologic changes following wildfire or other uncontrolled event, or irrigation related to agriculture or domestic homes. Pixel values will be systematically analyzed to understand cause of change.

Wetlands

Monitoring wetlands at the watershed-scale is difficult because functions and values are not always visually apparent. Information from the National Wetlands Inventory is not a reliable way to determine the actual existence of wetlands in Okanogan County, particularly on agricultural lands where many wet areas have been drained or altered prior to 2011. Accordingly, wetland monitoring will focus on the areas that are also identified and mapped by WDFW as “wetland habitat” on the PHS Map. Publicly available aerial imagery (NAIP or comparable) can be used to monitor the mapped wetland habitats where they intersect with agricultural activities. Technicians can look for clear changes in the extent or character of those areas in relation to agricultural activities. Any relevant changes will then be summarized and reported on a watershed basis, without identifying individual parcels.

Additional Monitoring Resources

The following programs are known monitoring and assessment programs that are conducted in Okanogan County. Data from these programs may be requested and used for effectiveness monitoring and to understand the condition of critical areas. Okanogan County and the Okanogan Conservation District will assist with additional state monitoring efforts as resources allow.

Washington Department of Ecology: Watershed Health Monitoring

The Watershed Health Monitoring program samples randomly-selected streams and rivers across the state to obtain a consistent, objective picture of biological, chemical, and habitat conditions. Samplings also allow us to track trends. The program is designed to answer questions about the overall condition of watersheds. Watershed Health Monitoring in Okanogan County occurred most recently in 2017 and 2018.

Washington Department of Ecology: Watershed Health Monitoring

Ecology periodically develops reports on Groundwater Levels Status and Trends and Statewide Groundwater Assessments.

Confederated Tribes of the Colville Reservation: Okanogan Basin Monitoring and Evaluation Program

The Okanogan Basin Monitoring and Evaluation Program (OBMEP) is a monitoring program created in 2004 within the Confederated Colville Tribes' Fish and Wildlife Department and is funded primarily by the Bonneville Power Administration through the Columbia Basin Fish Accords. OBMEP collects long-term data on salmon and summer steelhead and respective habitats in the Okanogan River Basin, including the Canadian portion.

OBMEP has created an interactive webpage to display and share the data that has been collected over the years. All of OBMEP's reports and data links are presented on http://www.okanoganmonitoring.org.

Washington Department of Fish and Wildlife, local stakeholders: Fish Barrier Assessments

Washington Department of Fish and Wildlife manages a database of fish passage barriers, which are periodically updated by WDFW and local partners.

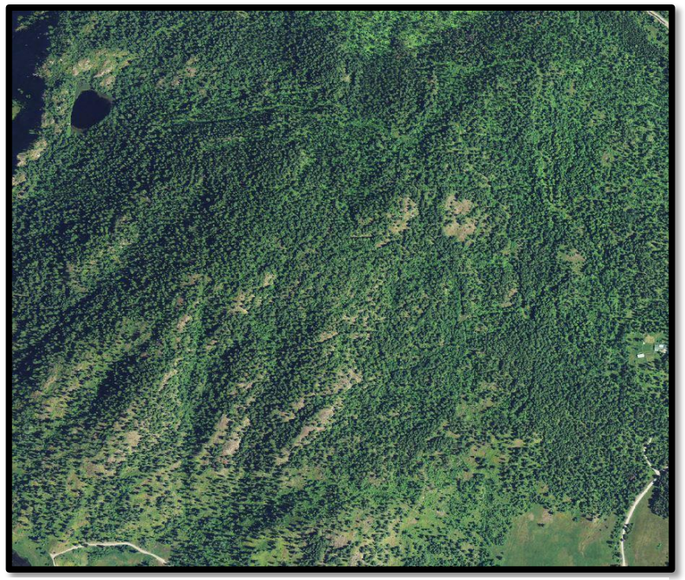
Okanogan County Public Health: Well water quality monitoring

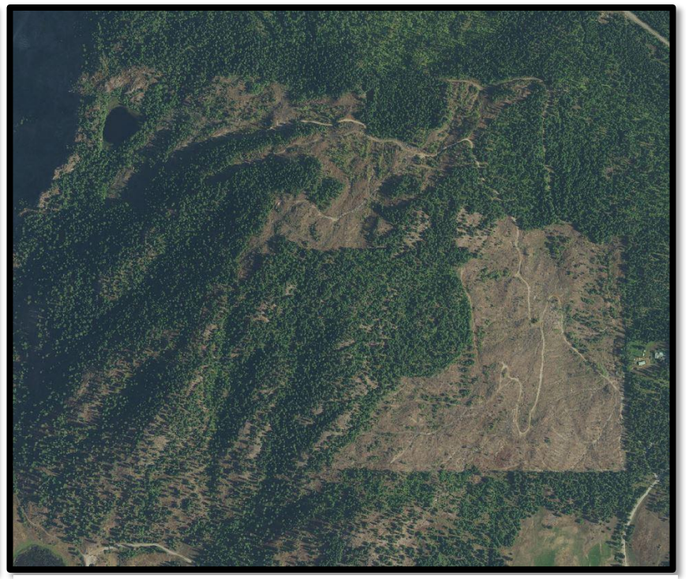
Okanogan County Public Health tests well and drinking water samples for nitrates and fecal coliform.

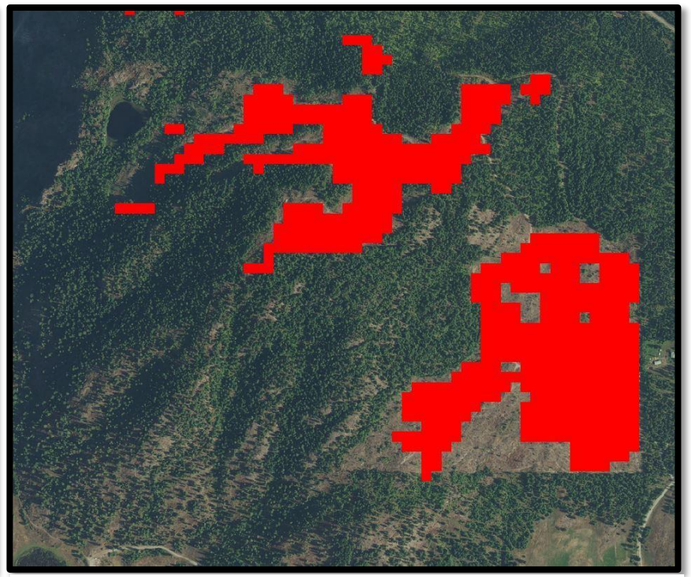
Critical Area Verification

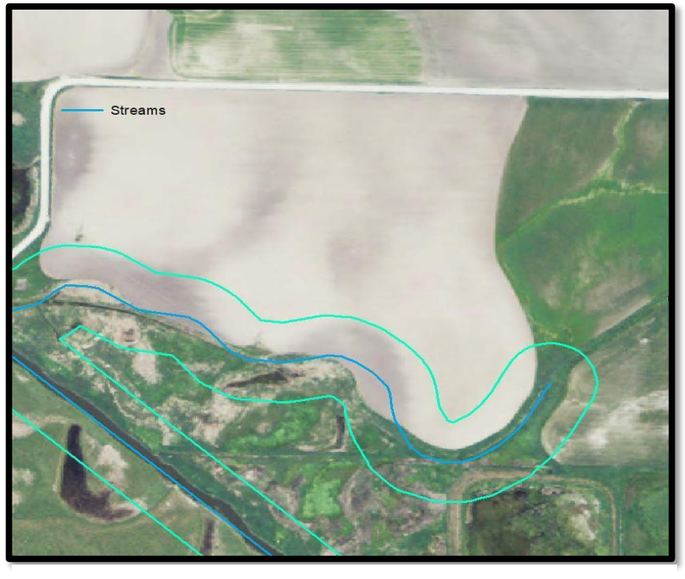
Critical areas will be verified through random site verification for aerial monitoring, practice planning process, and individual stewardship checklists for individuals who have opted in to VSP. Information will be summarized at the watershed scale.

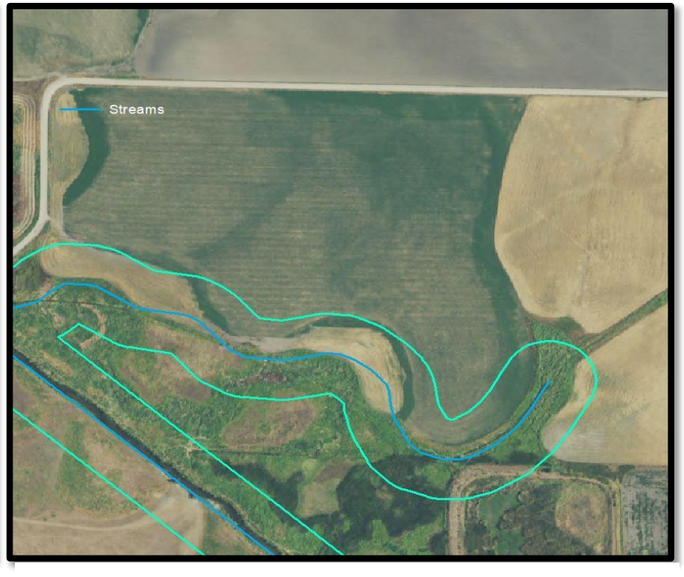
Vegetation Change Detection with Landsat and NAIP Imagery [1]

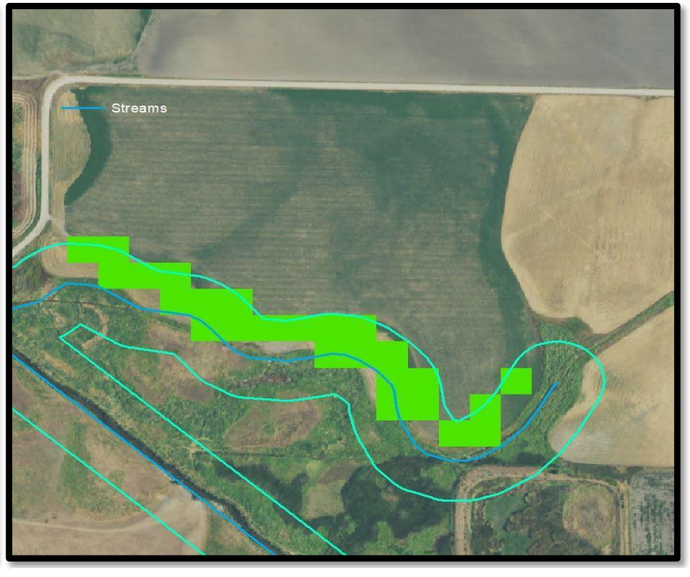












2011 NAIP Image – Riparian Area

2015 NAIP Image – Riparian Area

2015 NAIP Image with vegetation changes detected using Landsat imagery

1. For illustration purposes only. VSP reporting will describe aggregate changes at the watershed scale and will not include images or exact locations of vegetation changes.
2. Timber harvest is controlled outside of the VSP. The images showing timber harvest were used to provide a clear demonstration of vegetation change detection.

Appendix J: Outreach Plan

Outreach for Work Plan Development (2018)

STAGE:	ACTION ITEM:	LEAD:	WHEN:	OUTCOME:
Workgroup Formation	Initial notification letter to watershed stakeholders. Invitation to participate in decision to 'opt-in'.	Okanogan County	September 2011 October 2011	Notice in the Omak Chronicle; letters and emails sent leadership and staff of groups representing ag, tribal, and environmental interests including watershed groups. Advisory group met in October 2011 and recommended the County to 'opt in' to VSP.
	Board of County Commissioners selects the County as Lead Entity, and identifies potential participants (Resolution 126-2015)	Okanogan County	December 2015	Commissioners identify work group participants. Advertisement published in Omak Chronicle for Work Group applicants February 2016
	Outreach to ag organizations • Okanogan County Cattlemen Association • Okanogan County Farm Bureau • Okanogan Horticulture Association	Okanogan County	2011 and ongoing	Representatives from each ag organization were informed about VSP process and invited to kickoff meeting.
Work Plan Development	Outreach to Colville Confederated Tribes and Yakama Nation Request Work Group participation Update biologists at watershed meetings Provide draft Work Plans to biologists and CCT Planning Director for review	Okanogan County Okanogan Conservation District	2011, 2016, 2017 2018	Shared work plan drafts with Yakama and CCT biologists, CCT Natural Resource Department Director and CCT Planning Director for review. Did not receive comments on the plan.
	Outreach to stakeholders via watershed action team meetings in Methow and the Okanogan. • Methow Conservancy • Methow Salmon Recovery Foundation • Natural Resource Conservation Service • Okanogan Highland Alliance • Okanogan County Weed Board • Okanogan Land Trust • Washington Water Trust • Trout Unlimited • State Agencies: Ecology, WDFW, WSDA, DNR • Colville Confederated Tribes • Yakama Nation • Federal Agencies: Reclamation, BLM, Forest Service • WSU Extension, Okanogan PUD, County Public Works	Okanogan Conservation District	December 2017-March 2018	Acquired planning documents and data on project implementation during plan development and research.

	Online- VSP Website maintained on County and Okanogan CD web pages Okanogan CD Facebook posted announcements for work plan reviews	Okanogan County and Okanogan Conservation District	ongoing	Draft Work Plan is available for review by stakeholders.
	Develop and distribute outreach materials One Page VSP Fact-sheet Spring VSP Newsletter Fair Display Tri-fold poster VSP section in OCD Newsletter	Okanogan Conservation District, the VSP Work Group (distribution)	January 2018	All listed materials were developed and distributed. Currently, little interest in VSP. Work Group members will continue to reach out to their respective groups.

Implementation Outreach Goals: 2018 -2021

Type of Outreach	Goal	Outreach Item	Outreach Lead	Number Completed
Tours and Workshops	Two tours	VSP participant-led tours Stewardship practice work shop Legislative and partner agencies outreach tours Private sector industry tours	OCD/ VSP Technical Staff	
Meetings	VSP covered on the agenda at 10 or more meetings or workshops.	CD monthly board meetings (public meetings) CD annual meetings Meetings of relevant organizations (ex. Cattlemen's Association) Annual Northcentral Washington CD meetings WSU Extension events Private sector industry-led meetings Informational Workshops	OCD/ VSP Technical Staff	
Media	Ten or more total print or online materials highlighting VSP opportunities	Program announcements on CD and partner websites, newsletters Okanogan County website News articles and ads with local newspapers Tri-fold brochure Stories on CD webpage from local farmers	OCD/ VSP Technical Staff	

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